LEASING

by

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B.Sc., McMaster University, Canada 2004

AN ESSAY SUBMITTED IN PARTIAL FULFILLMENT OF

THE REQUIREMENTS FOR THE DEGREE OF

M.Sc. MATHEMATICAL FINANCE

in

THE FACULTY OF GRADUATE STUDIES

(Department of Mathematics)

We accept this essay as conforming
to the required standard

The University of British Columbia

April 2006

Abstract

Leasing, as a financial instrument, has become an interesting emerging factor in the tremendous leasing market today. Motivated by this exciting development in the new world of international business, I am presenting this essay to introduce many aspects of this attractive yet complex issue. Firstly, this essay describes a general introduction to financial leasing, including its advantages and different kinds of credit risks. Structure of the leasing market and a comparison of financial leasing and purchasing are briefly mentioned. Two major focuses of this essay are the pricing of leasing contracts and leasing credit risks. More specifically, I will discuss how to value the leasing contracts via a real-option approach by establishing the equilibrium conditions and lease rates of any term. Applying the same idea, pricing a forward lease rate can also be deduced. Regarding leasing with credit risks, the determination of equilibrium lease rates is subjected to the possibility of default risks. This concept is also discussed in detail. Moreover, with support of real data, the current leasing industry in China is discussed with real applications in the telecommunication industry. The influence of banks participating as the leasing organization and leasing strategy for banks are two concepts presented as a conclusion to this essay as they relate to the current leasing situation in China.

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Acknowledgements

I would like to thank my supervisor, Dr. Ulrich Horst, for his helpful advices and his precious time. Without him, this would never have been completed. I would also like to thank all my friends for their persistent support. Finally, special thanks to my parents for their encouragement.

Yi Fan Tian

The University of British Columbia
April 2006

Chapter 1

Introduction

Leasing is a financial instrument that allows the lessee to use a physical asset without possessing its ownership. The lessee rents the asset from the leasing company for a certain length of time. At the end of lease period, she has no purchase option. Leasing is particularly useful for large and expensive equipment. It has the tax advantage of avoiding the annual leasing charges and an additional advantages of avoiding any down-payments. The leasing company, with available capital, will use their profitability in leasing the assets, while at the same time will defray depreciation charges to profits. Therefore, it is also a market model that separates propriety rights from using rights.

Currently, leasing is viewed by corporations as a financial instrument to be used for capital equipment during the period of financing the investment. Since the leasing companies supply "equipment" instead of "financing", this is another method of collecting operational capital, called financial leasing. It is also a member of the big "financial family" such as bank loans, company bonds or other long term lending services. It becomes a new credit form like bank credit and business credit. Therefore, financial leasing is a blend of financing and leasing.

If the underlying asset lacks good quality or a low cost, or does not meet the requirements of the company, it must be eliminated during the competition. Thus, companies should always renovate and update their equipment to coincide with current developments. Traditional methods of raising money for equipment are: (1) using their own capital; (2) borrowing money via bank loans; (3) issuing bonds, etc.. However, these methods all have their own disadvantages. Capital plays a vital role for the corporation. If it is frozen in fixed assets, it will eventually lead to endanger operating services. For instance, it is better to purchase equipment using bank loans than using the company's own capital. Bank loans are usually in effect for the short term, yet investment in fixed assets and receiving profits is measured in the long term. Bond issuing is neither convenient nor simple, especially for small companies. As a result, financial leasing is a new path for solving the above dilemmas.

The essay proceeds as follows. Chapter 2 presents the characteristics of financial leasing, including advantages and different types of risks. We also give a brief description on the leasing market structure. Chapter 3 characterizes the term structure of lease rates. Chapter 4 mainly states the model of equilibrium leasing under conditions of credit risk, also analyzes the lease credit risk spread including the relationship between the spread and different parameters. Chapter 5 discusses the idea of Miller's leasing vs. the buy-and-borrowing model. Chapter 6 analyzes the leasing market in China. Chapter 7 discusses the influence of banks as the leasing organization with applications in the telecommunication market, and Chapter 8 is the conclusion.

Chapter 2

Characteristics of Financing Leasing

Leasing as a form of financing has increased significantly over the past decades throughout the world. In this chapter, its advantages, relative risks issues and market structure will be introduced.

2.1 Advantages of Leasing

Leasing can bring the following main advantages:

1. *Introducing the equipment even in the situation of capital shortage.* With leasing, the company has the opportunities of choosing to pay full or part of the lease payment, and owns the right to use the equipment. The company can pay by installments within a given period of time, thus having the ability to produce earlier which will lead to earlier profits.

2. *Enhancing effective usage of capital.* If companies directly purchase the equipment, they have to pay the full amount using their capital or pay

the full amount using bank loans. In this case, the capital only has one purpose. However, with leasing, the payment can be paid fully or partially by the leasing company, the remaining capital can be used for other purposes with multi-profitability possibilities.

3. *Improving technology and productivity.* Companies with advanced technology and facilities can produce high quality and low-cost goods. If they save money for the purpose of purchasing the equipment, they will easily miss the opportunity of capturing the early market share. Therefore, leasing can obviously help them use facilities immediately and make profits in a relatively short time.

4. *Avoiding loss due to inflation.* Since inflation will definitely increase operational costs and sale prices, the price of the asset will be increased as well. With leasing, the lessor and lessee will settle a payment agreement in the contract. Since the contract agreement is based on the current money market conditions, no matter what happens in the future, the payments will remain the same.

However, leasing is a complicated economic activity which includes so many concepts besides the three parties (lessor, lessee, and commodity supplier), such as loan provider, financial warrantor, insurance company, tax authority, board of trade and commodity inspection institution etc. If there exists any risky problems within one party, the other parties will also be affected.

2.2 Default Risks of Leasing

Generally speaking, financial leasing has the following main risks:

1. **Breach risk on each party**

   When implementing the contract, most of the time the three parties (lessor, lessee and commodity supplier) can fulfill the contract successfully, but in some cases, one of the parties may breach the contract.

   (a) Lessee refuses to pay the leasing payment.

   If the equipment supplier cannot make the consignment at the date stated in the contract, or they supply an inferior piece of equipment, the lessee will suffer the loss and this will lead to the unimplementation of the contract. Moreover, the lessee may refuse to pay the rent, or return the commodity or drop out from the contract. Even though there is a stated remediation according to the contract, the lessee has the right to ask the equipment supplier to return the expenses, but the lessee should contribute sufficient cooperation. But in reality, it can always be counterclaimed by the lessor, which will result in problems of time delays, expenses and interest loss.

   (b) Lessee breaches the contract.

   In the situation where the lessee is not operating well and lacks turnover, they may delay or refuse to pay leasing payments. This situation especially occurs in the "stagflation" period, and involves the leasing company. In order to reduce or avoid this risk, the leasing company should make a careful inspection of the lessee's financial situation, credit, and operating ability.

   (c) Lessor breaches the contract.

   During the leasing transaction, the lessee also has the possibility of

bearing risks due to breaches of the lessor. If the lessor does not have enough capital and cannot issue the documented credit stated in the contract, then the equipment supplier is delayed by force, and the lessee will suffer the loss.

2. **Alteration of Interest Rate and Rate-paying**

   One of characteristics for the rental expense is the fixed amount of the payments which mostly includes the leasing rate and the value of the leased asset. However, the value of the leased asset is usually fixed, even though the interest rate is not fixed unless the capital rate that the leasing company borrowed from the bank or other financial institution is fixed as well. Otherwise, there would be some alteration during the leasing period, and the profitability for the company will be affected. In order to reduce and avoid this risk, usually in the contract of Renminbi operation, if the interest rate set by the Bank of China is changed, then the leasing payment should be adjusted accordingly. Within international trade, due to the instability of the USD interest rate, some leasing companies require the calculation to be done using a floating rate.

3. **Alteration of Foreign Exchange Rate in International Leasing**

   During international trade, exchange rate fluctuation is always a huge problem. Government cannot randomly change the exchange rate, and almost 99% of international trade depends on a market exchange rate. Because all international leasing transactions need to deal with foreign currency, it will be greatly affected through fluctuations. In the leasing contract, the currency used should be the same as the currency used in the purchase of the equipment. For instance, if the lessor uses the

Japanese Yen paying for the loan, and the lessee uses the US Dollar, the lessee needs to exchange this to the Japanese Yen, or there might be some risk regarding the exchange rate.

4. **Export Leasing Risk**

   Export leasing is another path of raising profit through exports. Lending facilities overseas can collect leasing payments by amortization. There exists a huge risk due to leasing aboard, therefore, the lessor company should carefully investigate the leasing industry. It is mainly because of the following exposures:

   (a) Politics Risk

   Since the lessee is a foreign corporation, it is dominated by a foreign government and laws. Before agreeing on the leasing asset, the lessor firm should examine the political stability and foreign exchange security provisions of the lessee's country. They should mainly concern themselves with whether there exists any limitations regarding paying foreign leasing payments by the lessee.

   (b) Credit Risk

   In exporting leasing, credit risk is extremely important. If the lessee is unable to fulfill the contract, i.e. refuses to pay or delays the payment, breaks down or deals with the leasing equipment without permission, the lessor can take action defined in the contract. The credit of foreign corporation needs to be investigated more carefully and reliably. Moreover, the lessor firm may need to learn the laws of the lessee's country in order to implement the necessary procedures under the foreign law or provisions.

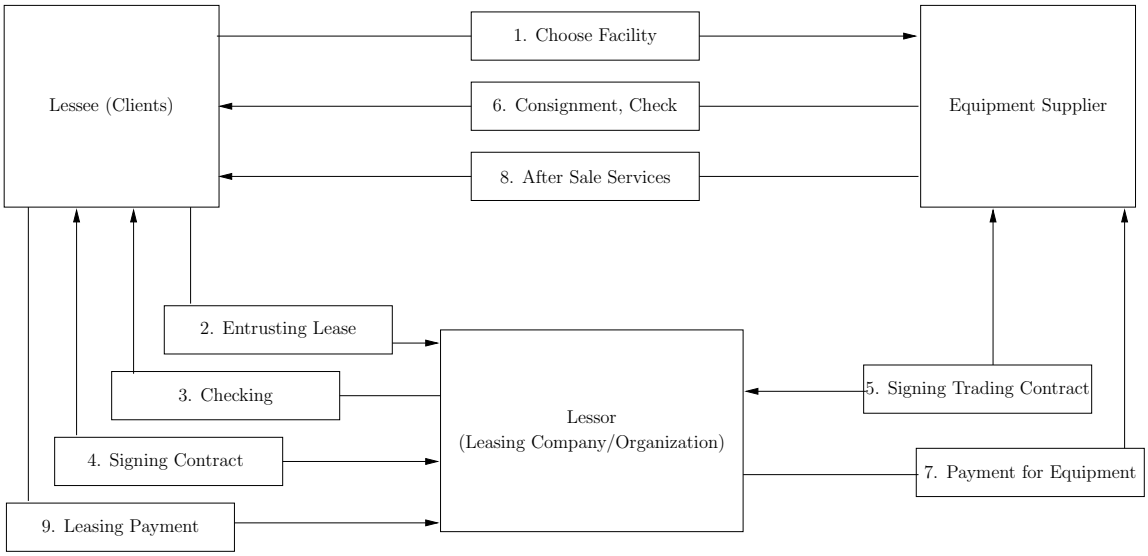

Figure 2.1: Financial Leasing Market Structure

Therefore, credit risks play a crucial role in leasing. Thus, the default risk model is not only used for the determining of the equilibrium of rental rates, but also for the understanding of the broad leasing conventions.

2.3 Financial Leasing Market Structure

There are different kinds of leasing market, but financial leasing is a typical leasing form of facility lease. When a company want to raise money, they can lease the asset rather than financing to improve the financial situation, thus it is usually treated as relative to the loan services. It has some main characteristics:

1. It includes three parties: lessor, lessee and facilities supplier. Also with more than two contracts: trading contract and leasing contract. It forms a triangle business. (See Exhibition 2.1)

2. Leasing companies/organizations only take charge of purchasing the facility subject to the clients. Thus, the companies will be charged due to equipment undelivered, delay and repairing.

3. When leasing period ceases, lessee has three options: purchasing, renewal or withdrawal from the contract.

Chapter 3

Valuing Leasing via Option-Approach

3.1 Competitive Equilibrium in the Spot Rental Market

Generally speaking, to evaluate a lease properly we determine how cash flows and risks affect the value of the corporation, and how fixed financing charges affect the market value of the prior claims they represent i.e. the market value of the equity to owners.

This section provides the idea on how to value a leasing contact via the real-option approach with the summary of Grenadier (1995), which mainly focuses on the equilibrium lease of a default-free lease. Since leasing separates the ownership from use, lessee receives the benefits of use and the lessor receives the value of the lease payments plus the residual value of the assets. Thus, the framework provided by Grenadier uses the option-pricing approach to lease valuation. In his model, the risk of default is not taken into account.

It points out that the value of leasing an underlying asset of T years is economically equivalent to a portfolio which lessee purchases the underlying asset and simultaneously writes a European option on the asset with maturity T and zero exercise price. The value of the lease must equal the value of the portfolio. The demand for the use of the asset, i.e. the service flow, is prone to the stochastic shocks. In the model of Grenadier (1995), he considers industry involved two sources of uncertainty: demand shocks and construction-cost shocks. Then the interaction of competitive firms, whose value-maximizing entry decisions is according to rational expectations, depends on an equilibrium determination of rent, supply and underlying asset values.

In the competitive leasing market, there was assumed that a large number of firms leases an asset, and one firm owns one unit of underlying asset. New supply may enter the market through new firms construction an additional units of the asset. If there is any new firm coming in, then it will construct an additional unit of asset with the one-time construction cost $C(t)$ which is proportional to numbers of units it supplied, i.e. the new supply at time t, which is denoted by $Q(t)$. And the construction cost has the form of geometric Brownian Motion and correlated with the demand shock:

$$dC = \alpha_c C dt + \sigma_c C dZ_c \tag{3.1}$$

where α_c is the instantaneous conditional expected percentage change in C per unit time, σ_c is the instantaneous conditional standard deviation per unit time. At that certain time, there will be the demand shock $X(t)$, it represents a multiplicative demand shock. it is quite uncertain at the next instant time compared to the supply, and is according to the geometric Brownian Motion:

$$dX = \alpha_x X dt + \sigma_x X dZ_x \tag{3.2}$$

where α_x is the instantaneous conditional expected percentage change in X per unit time, σ_x is the instantaneous conditional standard deviation per unit time.

Since the main determinant value from owning or leasing the asset is its underlying service flow. Thus, at time t, the instantaneous lease rate $P(t)$ will be involved to construct the inverse demand function combine with power utility function and is of a constant-elasticity form:

$$P(t) = X(t) \cdot Q(t)^{-1/\gamma}, \text{ where } \gamma > 0 \tag{3.3}$$

Therefore, according to above description, there are two kinds of firms in the market:

1. firms currently leasing the asset;

2. firms waiting for the quite moment to enter the market with new supply.

Let W denote the value of the existing firm which is currently leasing the asset, and let V denote the value of the idle firm which will construct the new supply in the future after entering the market. The value of the current existing firm W will depend on P (its rent cash flow) and C (since the equilibrium supply from the new firm will prevent W from rising above the construction cost). Therefore, we denote it by $W(P, C)$, however, it will not depend on the level of supply Q. By using the continuous-time version of the capital asset pricing model of Merton (1973), it can be calculated as the following form which is in Grenadier(1995) Eq.(18):

$$W(P, C) = -\frac{1}{\beta - 1}\left[\frac{\beta - 1}{\beta(r - \hat{\alpha}_x)}\right]^{\beta} C^{\beta-1} P^{\beta} + \frac{P}{r - \hat{\alpha}_x} \tag{3.4}$$

where $\beta > 1$. It represents the value of using the underlying asset.

By defining the demand to cost ratio as $\theta(t) = X(t)/C(t)$, new supply is risen when $\theta(t)$ rises to a function of certain supply $Q(t)$, which is also calculated and is of the following form:

$$\theta^*(Q) = \frac{\beta(r - \bar{\alpha}_x)}{\beta - 1} \cdot Q^{1/\gamma} \tag{3.5}$$

According to above equation, the equilibrium supply $Q^*(t)$ and equilibrium rent $P^*(t)$ can be expressed as function of the exogenous state variables in Grenadier (1995) Eq. (21):

$$Q^*(t) = \max\Big[\left(\frac{\beta - 1}{\beta(r - \hat{\alpha}_x)}\right)^{\gamma} \cdot \sup\theta(s)^{\gamma}, 0 \leq s \leq t, Q(0)\Big], \tag{3.6}$$

$$P^*(t) = X(t) \cdot Q^*(t)^{-1/\gamma}. \tag{3.7}$$

3.2 The Term Structure of Lease Rates

In the leasing contract, the lessee obtains the use of the asset for T-year from time 0 and the lessor receives the flow of rental payments, say $R(T)$ until time T, with the first payment made immediately at the time of signing of the contract.

An important assumption is worth to be mentioned here is that the fundamental determinant of value is the service flow of the asset, and that the fundamental ownership is not relevant. Therefore, it implies that any two methods of obtaining the use of the asset over the same time horizon must have the same equilibrium valuation.

Thus Grenadier constructed a portfolio which includes purchasing the underlying asset and writing a call option on the underlying asset with maturity T and zero exercise price subject to the same service flow. The value of the lease must equal the value of the portfolio. Therefore, the value of the

T-year lease is equal to $W(P, C)$ less the value of a European call option on W with an exercise price of zero and maturity T. Now the value of the call option need to be evaluated. Its terminal value depends not only on the final realizations of $X(T), C(T)$ and $Q^*(T)$ (equilibrium supply at maturity), but also on the entire path of $X(t)$ and $C(t)$ from time 0 to time T. Thus the option is the "path-dependent" options.

Let $L(P, C, T)$ denote the value of a T-year call option on W and current level $P(0) = P$ and $C(0) = C$. Since the exercise price is 0, it can always be exercised, thus it will economically equivalent to owning the asset from year T, which is just the expected discounted value of the rents from time T to infinity, where the expectations are under the risk-neutral probabilities. Likewise, we need to substitute $\hat{\alpha}_x$ and $\hat{\alpha}_c$ for α_x and α_c as mentioned above and to discount the expected values at the risk-free rate (r). Let $\hat{f}(p_t; P, C)$ denotes the risk-neutral distribution of $P(t)$ conditional on P and C. Therefore, the value of the call option is the solution to the following integral:

$$L(P, C, T) = \int_T^\infty \int_0^\infty e^{-rt} p_t \cdot \hat{f}(p_t; P, C) dp_t dt \tag{3.8}$$

by solving above integral [Grenadier (1995) Eq. (22)], obtained the closed-form of the following form:

$$\begin{aligned} L(P, C, T) =& C \cdot a_1(T) \Bigg[f(P, C, T, 1) - \frac{(\beta - 1)^{\beta - 1}}{\beta^\beta} f(P, C, T, \beta) \\ &+ \beta \cdot g(P, C, T, 1) - g(P, C, T, \beta) \Bigg], \end{aligned} \tag{3.9}$$

where

$$f(P,C,T,\nu) = \left[\frac{P}{C(r-\hat{\alpha}_x)}\right]^{\nu} \cdot \exp\left\{\frac{[\alpha_2(\nu)]^2 T}{2\sigma^2}\right\} f_1(P,C,T,\nu),$$

$$f_1(P,C,T,\nu) = f_2(P,C,T,\nu) - f_3(P,C,T,\nu),$$

$$f_2(P,C,T,\nu) = \Phi\left(\frac{\bar{M}(P,C) - a_2(\nu)T}{\sigma\sqrt{T}}\right),$$

$$f_3(P,C,T,\nu) = \exp\left[\frac{2\alpha_2(\nu)\bar{M}(P,C)}{\sigma^2}\right] \cdot \Phi\left[\frac{-\bar{M}(P,C) - \alpha_2(\nu)T}{\sigma\sqrt{T}}\right],$$

$$g(P,C,T,\nu) = \exp\left\{\frac{[a_2(\nu)]^2 T}{2\sigma^2}\right\} \cdot \frac{g_1(P,C,T,\nu)}{\beta - 1},$$

$$g_1(P,C,T,\nu) = g_2(P,C,T,\nu) + g_3(P,C,T,\nu),$$

$$g_2(P,C,T,\nu) = \left[\frac{a_2(\nu) - \nu\sigma^2}{a_3(\nu)}\right] \cdot \exp[-\nu a_3(\nu)T]\Phi\left[\frac{a_2(0)T - \bar{M}(P,C)}{\sigma\sqrt{T}}\right],$$

$$g_3(P,C,T,\nu) = \frac{a_2(\nu)}{a_3(\nu)} \exp\left[\frac{2a_3(\nu)\bar{M}(P,C)}{\sigma^2}\right] \Phi\left[\frac{-a_2(\nu)T - \bar{M}(P,C)}{\sigma\sqrt{T}}\right],$$

$$\bar{M}(P,C) = \ln\left[\frac{\beta(r-\hat{\alpha}_x)}{\beta-1} \cdot \frac{C}{P}\right],$$

$$a_1(T) = \exp\left[\left(\frac{2\sigma^2(\hat{\mu}-r) - \sigma_c^2(\rho\sigma_x - \sigma_c)^2 - \hat{\mu}[2\sigma_c(\rho\sigma_x - \sigma_c) + \hat{\mu}]}{2\sigma^2}\right)T\right],$$

$$a_2(\nu) = \frac{\sigma^2(2\nu-1)}{2} + \hat{\alpha}_x - \hat{\alpha}_c,$$

$$a_3(\nu) = \frac{\sigma^2(\nu-1)}{2} + \hat{\alpha}_x - \hat{\alpha}_c,$$

with

$$\hat{\mu} = \hat{\alpha}_x - \frac{1}{2}\sigma_x^2 - \hat{\alpha}_c + \frac{1}{2}\sigma_c^2,$$

$$\sigma = \sqrt{\sigma_x^2 + \sigma_c^2 - 2\rho\sigma_x\sigma_c},$$

and ρ denote the correlations of dX/X and dC/C with the return on the market. $\hat{\alpha}_x$ and $\hat{\alpha}_c$ are the risk-neutral growth rates for X and C. $\Phi(\cdot)$ denotes the cumulative standard normal distribution function.

According to above definition of T-year lease, it is equivalent to **long** one unit of the asset and **short** one unit of the call option, thus the value can be expressed as $W(P,C) - L(P,C,T)$. Since the equilibrium long-term lease payment provides an annuity value equal to the equilibrium lease value. Therefore, the equilibrium term structure of lease rates can be expressed as

$$R(P,C,T) = \left[\frac{r}{1-exp(-rT)}\right] \cdot [W(P,C) - L(P,C,T)] \tag{3.10}$$

Since

$$\begin{aligned}
&\int_0^T R(P,C,T)e^{-rt}dt = W(P,C) - L(P,C,T) \\
&R(P,C,T)\int_0^T e^{-rt}dt = W(P,C) - L(P,C,T) \\
&R(P,C,T) = \frac{1}{\int_0^T e^{-rt}dt}[W(P,C) - L(P,C,T)] \\
&R(P,C,T) = \left[\frac{r}{1-exp(-rT)}\right] \cdot [W(P,C) - L(P,C,T)]
\end{aligned}$$

where $R(P,C,T)$ is the equilibrium rent on a T-year lease if the current rent and construction costs are P and C respectively. This is also compared with the Cox, Ingersoll, and Ross (CIR) model and the Vasicek model of the term structure of interest rates converging to the perpetual lease rate, which was considered equivalently to the ownership of the asset. Therefore, the value of the asset $W(P,C)$ should equal to the discounted value of the equilibrium perpetual lease rate $R(P,C,\infty)$, i.e.

$$W(P,C) = \frac{R(P,C,\infty)}{r}$$

or

$$R(P,C,\infty) = r \cdot W(P,C) \tag{3.11}$$

According to equation (3.4), differentiating $R(P, C, \infty)$ by assuming $r > \hat{\alpha}_x$ and $\beta > 1$, it can be proved that

$$\begin{aligned}
\frac{\partial R(P,C,\infty)}{\partial P} &= r \cdot \frac{\partial W(P,C)}{\partial P} \\
&= -\frac{r\beta}{\beta - 1}\left[\frac{\beta - 1}{\beta(r - \hat{\alpha}_x)}\right]^{\beta} (\frac{P}{C})^{\beta-1} + \frac{1}{r - \hat{\alpha}_x} \\
&= \frac{r(\beta-1)^{\beta-1}}{\beta^{\beta-1}(r-\hat{\alpha}_x)^{\beta}} + \frac{1}{r-\hat{\alpha}_x} \\
&> 0
\end{aligned}$$

and

$$\begin{aligned}
\frac{\partial R(P,C,\infty)}{\partial C} &= \frac{\partial R(P,C,\infty)}{\partial C} \\
&= -\frac{P^{\beta}}{\beta - 1}\left[\frac{\beta - 1}{\beta(r - \hat{\alpha}_x)}\right]^{\beta} (1-\beta)C^{\beta} \\
&= \left[\frac{\beta - 1}{\beta(r - \hat{\alpha}_x)}\right]^{\beta} \cdot \left(\frac{P}{C}\right)^{\beta} \\
&> 0
\end{aligned}$$

It is seen that the perpetual lease rate is increasing respect to both state variables.

Moreover, compared with the CIR model or Vasicek model of term structure of interest rates, it shows that the yield curve for rents may take on three slopes: downward-sloping, upward-sloping and single-humped. Those can be explained by introduced with different kinds of markets. If the ratio of the spot rent to construction cost is high or almost hit the upper bound that stands for incoming of new supplies, it leads to the downward-sloping. Because according the rational expectation of the market, the new supply will be anticipated in the near future, if the term structure does not adjust to such expectations, **lessees** would prefer to transfer to some short-term leases rather

than a long-term lease. Therefore, the term structure need to be adjusted by allowing the long-term lease rates to fall; Likewise, if the ratio of the spot rent to construction cost is low or no new supplies will be expected in the near future, it will lead to a upward-sloping. Because **lessors** would prefer transfer to some short-term leases rather than a long-term lease if the term structure without adjusting. Eventually, for the intermedia cases, the term structure is single-humped shaped. Since the new supply is not expected in the very short future but it may be expected afterwards. Thus, the rates are expected to rise and then fall down once there is the new supply coming in. One thing need to be noticed that for above three cases, they all converge to a perpetual lease rate $R(P, C, \infty)$.

3.3 The Valuation of Forward Leases

Leasing contracts in the real world will have a time lag between the contract signing and the first rent payment. The definition of this kind of leasing is called *forward leases*, since the payment does not begin until after the rent is contractually determined. It can be represented mathematically by saying that the lessee has been given the right to use the asset today (at time 0) for τ years, beginning at time T_1. Thus, lessee should promise to make τ years of lease payments from T_1 to $T_1 + \tau$. In other words, this is a T_1-year forward contact on a lease of τ years.

According to the Grenadier's (1995) model in previous section of the equilibrium term structure of lease rates, a portfolio is also well-constructed by:

1. purchasing a European call option on the asset with maturity T_1 and

zero exercise price;

2. simultaneously writing a European call option with maturity $T_1 + \tau$ and zero exercise price.

Therefore, the equilibrium value of the forward lease contract is

$$L(P, C, T_1) - L(P, C, T_1 + \tau),$$

where $L(P, C, T)$ is the value of the call option with maturity T derived in previous section Equation (3.9). As the equilibrium term structure of lease rate, the annuity value of the equilibrium forward lease payment equal to the equilibrium forward contract value. Let the equilibrium τ-year forward lease rate which is agreed at time 0, starting from year T_1, be denoted by $R^F(P, C, T_1, \tau)$, thus it will have the following form:

$$R^F(P, C, T_1, \tau) = \left[\frac{r}{exp(-rT_1) - exp(-r(T_1 + \tau))}\right] \cdot [L(P, C, T_1) - L(P, C, T_1 + \tau)] \tag{3.12}$$

From the above equation, we observe that when $T_1 = 0$, the equilibrium forward rate is exactly the equilibrium rate on a τ-year lease as evaluated in previous section Equation (3.10).

For the forward lease contract, the forward lease rate curves share the same shapes with the term structure of interest rates, e.g. if the underlying term structure of lease rates is downward-sloping then the forward lease rates will be downward-sloping, vice versa. Moreover, the longer term of the lease contract, the lower is the forward rent, and keeping the downward slope of the underlying yield curve, which quite makes sense in the real world.

Chapter 4

Leasing and Credit Risk

4.1 Equilibrium Lease Rates under Credit Risk

In this chapter the equilibrium leasing rates will be determined when there exists credit risk in the leasing market according to the model of Grenadier (1996). The main difference between Grenadier (1995) and Grenadier (1996) is whether the equilibrium lease rate is determined subjected to default-free or default risk .

In the equilibrium, the agreed leasing payment is used to compensate the lessor for both the forgone use of the asset and the potential default risk. Grenadier (1996) deduced the equilibrium lease rate model under two sources of uncertainties: 1. The value of leasing asset is stochastic; 2. Timing and consequences of default are stochastic. Assuming risk neutrality, all assets are priced to yield an expected rate of return equivalent to the risk-free rate r, which was used in Cox and Ross (1976). Let $S(t)$ be the value of using the asset (i.e. leased value), it also evolves the following diffusion process:

$$dS = \alpha_s S dt + \sigma_s S dZ_s, \tag{4.1}$$

where α_s is the instantaneous conditional expected percentage change in S per unit time and $\sigma_s(S,t)$ is the instantaneous conditional standard deviation per unit time. The sign of α_s can be used for expressing the appreciation or depreciation over time.

Consider a T-year lease, assuming that lessor should get the amount $Y(S,T)$, Since Y depends on the diffusion process S, thus the value would be the average amount over the T years.

Moreover, since the given diffusion dynamics S is under $\mathcal{P}$ measure, thus the prices will be the expected value of the discounted future dividend when the expectation is taken with respect to the risk neutral measure $\mathcal{Q}$, both $\mathcal{P}$ and $\mathcal{Q}$ are under the σ-algebra $\mathcal{F}_t$. Therefore, assume the rate of return on a riskless asset is α, the probability measure makes the process S behave as

$$dS = \alpha S dt + \sigma_s S dZ_s^\theta \tag{4.2}$$

By Girsanov Theorem, this probability measure $\mathcal{Q}^\theta$ is defined by $\theta = \frac{\alpha_s - \alpha}{\sigma_s}$.

Thus,

$$Y(S,T) = E_{\mathcal{Q}^\theta}\left[\int_0^T e^{-rt} S(t) dt\right] \tag{4.3}$$

$$= \frac{S}{r-\alpha_s}[1 - e^{-(r-\alpha_s)T}] \tag{4.4}$$

Consider a T-year lease to a risk-less lessee, call the value of using the asset for T years in return with the sure payment $R(T)$. Then the equilibrium risk-less rate $R(T)$ is the payment that its annuity value equals $Y(S,T)$, thus it will have the following equation like previous chapter:

$$R(T) = \left(\frac{r}{1-e^{-rT}}\right) Y(S,T) \tag{4.5}$$

$$= \left(\frac{1-e^{-(r-\alpha_s)T}}{1-e^{-rT}}\right) \frac{rS}{r-\alpha_s} \tag{4.6}$$

When the lessee is subject to the default risk in a T-year lease, and lessee may pay the promised rental rate $P(T)$ over the lease period, and there existed the possibility that lessee cannot fulfill the contract during the period.

Lease default can be divided into two parts: the **occurrence** of default and the **consequences** of default. In the following subsections, we will go over these two parts.

4.1.1 Modeling the Occurrence of Default

To model the occurrence of default, Grenadier (1996) adopted the model introduced by Merton (1974), Black and Cox (1976). Since the default occurs when cash flow or asset value hits or falls below a lower boundary, say threshold K.

Let $X(t)$ denote a state variable of the lessee, such as cash flow or the value of the underlying asset. Thus, the lessee defaults if $X(t) \leqslant K$, which could due to the late payments or the above situations mentioned. In other words, mathematically written, default triggered at time t^* that $t^* = inf[t < T : X(t) \leqslant K]$, and there is no defaults if $t^* = \infty$. $X(t)$ was assumed with the following process,

$$dX = \alpha_{x,t} X dt + \sigma_{x,t} X dZ_x \tag{4.7}$$

where $\alpha_{x,t}$ is the instantaneous conditional expected percentage change in X per unit time and $\sigma_{x,t}$ is the instantaneous conditional standard deviation per unit time. Let $\rho(S, X, t)$ denote the instantaneous correlation coefficient between the Wiener process dZ_s and dZ_x, and when $\rho > 0$, default is more likely to occur when value of the asset is the lowest; when $\rho < 0$, default is more likely to occur when the asset value is the highest. The occurrence of default is quite consistent with Hull-White default model. Hull and White assume that default occurs the first time, say time t, when $G(\Phi, t) = 0$ for

some function G, and Φ is defined as a vector of state variables determining the occurrence of default, with $\Phi = X/K$ and $G = \ln(\Phi)$, again where X is the state variable and K is the boundary value.

4.1.2 Modeling the Consequences of Default

In the real world, once the default occurs, in order to minimize the loss, the lessor may sell the asset, demand payments of all future lease payments, or re-lease the asset to other lessee. However, due to the depreciation or other losses of the asset, thus by re-leasing the asset, lessor may not get the full amount of the remaining lease value. To present it mathematically, if default occurs at time t, and if the asset is fully recovered and immediately re-leased, the remaining lease value should be $Y[S(t), T - t]$, but due to the cost of default, the lessor can only receive a fraction, $1 - \omega$, of this remaining lease value, where $\omega \in [0, 1]$.

Therefore, to model the consequences of default, Grenadier (1996) firstly used two different situations of leasing the asset for T years to determine the equilibrium of the lease rate $P(T)$ under the default of risk. The equilibrium condition is that the value of leasing the asset to a risk-less lessee should equal to the value of leasing the asset to a risky lessee, after default occurs, then lease it to a risk-less lessee for the remainder of the term. Therefore, the equilibrium rate will help to compensate the risks for lessor.

Here are the two situations:

1. Signing a T-year lease contract with a risk-less lessee of lease value $Y(S, T)$.

2. Signing a T-year lease contract with a risky lessee at the rental rate $P(T)$. If default occurs at time $t < T$, other risk-less lessee will rent for

the remaining $(T-t)$ term, however, due to the cost of default, the lessee can only recover a fraction $1-\omega$ of $Y[S(t), T-t]$ where ω is constant.

If $F(S, X, t; P, T)$ is denoted the value of situation 2, $P(T)$ will be determined as the equilibrium lease value under the equilibrium condition by setting that the values of two situations are equal. Here t is the current time and S and X are the current values of $S(t)$ and $X(t)$, and P is the equilibrium rent rate which will be determined. For situation 2, we have

$$F(S, K, t; P, t) = (1-\omega) \cdot Y[S(t), T-t] \tag{4.8}$$

If there is no default occurs, the value of the remaining rental payments equals zero at maturity, i,e,

$$F(S, X, T; P, T) = 0 \tag{4.9}$$

According to the equality assumption on two situations, the equilibrium rent on a T-year lease subject to default risk, $P(T)$, is set at time 0, thus the equality can be written as

$$F(S, X, 0; P(T), T) = Y(S, T) \tag{4.10}$$

at time 0, $\alpha_{s,t}$, $\alpha_{x,t}$ and $\rho(S, X, t)$ are equal to the constants α_s, α_x and ρ. Since the equilibrium rent on a T-year lease is subject to $P(T)$, and it is also set at time $t = 0$. The solution of $F(S, X, t; P, T)$ is

$$F(S, X, t; P, T) = \Phi_1(P, \tau) - \Phi_2(X, \tau) \cdot \frac{P}{r} + \Phi_3(X, \tau) \cdot (1-\omega)\frac{S}{r-\alpha_s} \tag{4.11}$$

where

$$\Phi_1(P,\tau) = \frac{P}{r}[1 - e^{-rt}],$$
$$\Phi_2(X,\tau) = \left(\frac{X}{K}\right)^{c_1} G(X,\tau,a_2) - e^{-rt} G(X,\tau,a_1),$$
$$\Phi_3(X,\tau) = \left(\frac{X}{K}\right)^{c_2} G(X,\tau,a_4) - e^{-(r-\alpha_s)\tau} G(X,\tau,a_3),$$
$$G(X,\tau,y) = N\big[\frac{\ln(K/X) - y\tau}{\sigma_x\sqrt{\tau}}\big] + \left(\frac{K}{X}\right)^{2y/\sigma_x^2} N\left[\frac{\ln(K/X) + y\tau}{\sigma_x\sqrt{\tau}}\right],$$
$$c_1 = \frac{a_2 - a_1}{\sigma_x^2},$$
$$c_2 = \frac{a_4 - a_3}{\sigma_x^2},$$
$$a_1 = \alpha_x - \frac{1}{2}\sigma_x^2,$$
$$a_2 = \sqrt{a_1^2 + 2r\sigma_x^2},$$
$$a_3 = \alpha_x + \rho\sigma_x\sigma_s - \frac{1}{2}\sigma_x^2,$$
$$a_4 = \sqrt{a_3^2 + 2(r-\alpha_s)\sigma_x^2},$$
$$\tau = T - t,$$

and $N(\cdot)$ denotes the cumulative standard normal distribution function.

The first term $\Phi_1(P,\tau)$ is equal to the value of the risk-free rental. The second term $\Phi_2(X,\tau)\cdot\frac{P}{r}$ is the value of the loss of the rentals if the lessee defaults. The third term $\Phi_3(X,\tau)\cdot(1-\omega)\frac{S}{r-\alpha_s}$ is the value of the rent that is recovered if the lessee defaults. Therefore, from the above equation, we can treat the second situation as a portfolio consisting of a risk-less lease, a short position in the contract that pays for the credit loss under the contract and a long position in the contract that pays the amount recovered from the default. Therefore, in Grenadier (1996) Eq. (13), the equilibrium rent $P(T)$ subjected

to the credit risk is:

$$P(T) = \left(\frac{rS}{r-\alpha_s}\right)\left[\frac{1-e^{-(r-\alpha_s)T}-\Phi_3(X,T)(1-\omega)}{1-e^{-rT}-\Phi_2(X,T)}\right] \tag{4.12}$$

4.2 Analysis of Lease Credit Risk Spread

To understand better about the influence of credit risk on the a risky lease, credit risk spread needs to be analyzed. It is defined as $P(T) - R(T)$, and denoted as $D(T)$. Lessors usually adjust the rents charged to a risky lessee to make sure indifference relative to a default-free lease. It would be similar to study the risk structure of interest rates. Merton (1974) states the difference between the yield between the yield on a defaultable bond and a risk-less bond. However, from Grenadier's point of view, bond is essentially the sale of lump sum of cash in return for a series of future cash flows, yet a lease is the sale of the economic benefits of certain asset. Therefore, the lease credit risk spread will be related to the both lessee and the leased asset, also some contractual provisions.

According to the definition of credit risk spread, [as shown in Grenadier (1996) Eq. (14)] $D(t)$ will have it as the following form:

$$\begin{aligned} D(T) &= P(T) - R(T) \\ &= \left(\frac{rS}{r-\alpha_s}\right)\left[\frac{1-e^{-(r-\alpha_s)T}-\Phi_3(X,T)(1-\omega)}{1-e^{(}-rT)-\Phi_2(X,T)} - \frac{1-e^{-(r-\alpha_s)T}}{1-e^{-rT}}\right] \end{aligned} \tag{4.13}$$

Different parameters will have the different impact on the spread.

From a series of plots by Grenadier, they illustrate the relationship between credit risk spread and different parameters.

- *Impact of lease maturity* (T) *on the spread.*

The plot is quasi-liner with positive slope. It shows a simple intuition: The longer the term, the greater the likelihood of default occurring. It quite make sense in the real-world leasing, it predicts that the risky lessee will be charged a greater risk premium than the less risky lessee.

- *Impact of the faction of the lease value lost in default* (ω) *on the spread.*

  The spread is increasing and linear in ω, which can also be seen from Equation (5.11). This would imply that larger lessors can charge lower credit spreads than smaller lessors. In other words, if the lessor firm is more powerful than lessee, then ω would be lower.

- *Impact of the ratio of the lessee's asset value to default trigger* (X/K).

  The spread is exponentially decreasing with the ratio (X/K). According to the equation and values of $\Phi_2(X,T)$ and $\Phi_3(X,T)$, the variables X and K affect $D(T)$ only through the ratio X/K. Thus, the higher the ratio, the lower the likelihood of default during the lease term. When X/K increases, the spread falls to zero and the risky lease rate approaches to that of a risk-free lease.

- *Impact of correlation* (ρ) *between the lessee's firm value and the underlying asset on the spread.*

  The plot again shows an increasing linear curve. It implies that the greater the correlation, the worse the impact of the default, since the firm whose profits are most correlated with the value of the underlying asset would pay higher rent.

- *Impact of volatility of the underlying asset* (σ_s) *on the spread.*

  This simulations shows that the influence depends on the sign of ρ. If

$\rho > 0$, the spread is increasing in σ_s. If $\rho < 0$, the spread is decreasing in σ_s. If $\rho = 0$, the spread is constant in σ_s. The intuition is that when $\rho > 0$, default is likely to occur when leased asset is depressed. Conversely, if $\rho < 0$, default is likely to occur when asset value is unexpectedly high. When $\rho = 0$, the event of default is uncorrelated with asset values.

- *Impact of volatility of the lessee's financial state variable* (σ_x) *on the spread.*

  The plot is an increasing quasi-linear curve. The intuition is that since the lessor prefers to avoid the consequences of lease default, thus the spread should be set highly enough to compensate the risk. It means that lessees with lower asset volatility will be charged by lower rents. For instances, firms with divisions of businesses may pay lower rents than more concentrated firms.

Chapter 5

Financial Leasing Compare to Purchasing

5.1 Financial Leasing Compare to Purchasing From Accumulate Capital

Nowadays, corporations face intensive competition compared with decades ago. Preventing from being eliminated from the market, corporations have to grasp every opportunity and to produce high quality and low-cost products or services which fit the market. Therefore, corporations have to always innovate technology and update facilities.

By taking the Telecommunication Company for example, people cannot live without mobile phones or networking services. Currently high quality technology on the communication system is required. Some companies prefer to lease fiber and cable to make their business more effective to make more profit in the business of long distance calling and mobile services than before.

If the company directly purchases them, production may be delayed and

will lead to market opportunity loss. For instance, some company can make a profit of USD3 million by using their current facilities. After introducing the new technology, profit will be doubled annually, i.e. USD6 million. given the cost of updating facilities is USD10 million. If the company accumulates the funds, assuming interest rate is 6% p.a., they need to accumulate more than 3 years without making profit until the fourth year. However, with leasing, they can immediately earn money in the first year for about USD1.5 million quarterly (including new and old equipment profitability), therefore, the company is able to pay for the leasing payment and make profit at the same time. Assuming the leasing rate is 8%, if they pay USD1.5 million every quarter for the leasing payment, then it can be paid off within 2 years and corporations can make net profit thereafter. Compared with the ways of accumulating funds, with leasing they can make profit more than USD3 million. Therefore, leasing is much more effective than accumulating funds for purchasing the facilities.

5.2 Financing Leasing Compared to Purchasing From Bank Loan

Some people considered that borrowing loan is cheaper than leasing, actually it is not always true. As long as there existed privilege of taxation and high real profitability on leasing, it will be cheaper than borrowing loans. In some foreign countries, there are some bonuses referred to tax subjected to the "owner" who purchases the new facilities. Myers, Dill and Bautista (MDB) model shows that differences between the values of two strategies is equal to these incremental cash flows discounted at the after-tax rate of interest. Thus,

the present vale (PV) of the differences between leasing and borrowing is given by

$$V_0 = A - \sum_{t=0}^{H} \frac{P_t(1-T^*) + b_t T^*}{(1 + r_D(1-T^*))^t} \tag{5.1}$$

where

$$\begin{aligned} A &= \text{purchase price of the facilities} \\ P_t &= \text{lease payment in year t} \\ b_t &= \text{depreciation of leased facilities' value in period t} \\ T^* &= \text{company's marginal tax rate} \\ r_D &= \text{required rate of return on debt} \end{aligned}$$

From the same expression, with the sign on the cash flow changed, it also gives the lease value to the lessor, that is, it represents the difference in value between the strategy of purchasing the assets and leasing. If the present value of the equivalent loan is less than the value of the lease, leasing is preferred. Otherwise, firm will borrow. In other words, if the equivalent loan makes use of less debt than the lease creates, then leasing is preferred.

Chapter 6

Leasing Market in China

There exists same reasons for financial leases coming into being in every country. There is a high demand for fast development of productivity. This has led to changes in traditional lending services. However, different regimes and economic systems cause different leasing markets to have their own characteristics. Currently, China's leasing industry has the following main characteristics:

1. The Hesperian leasing market has very strict laws, accounting and taxation systems. This creates plenty of advantages for their countries. However, financial leasing in China is still underdeveloped, due to the immature commercial system, law and foreign exchange management. Thus leasing as a new financing instrument, needs rapid development under this impercipient economy.

2. Different from other developed countries, the leasing industry in China has developed its international leasing market first, then the domestic market. This is because, with the harsh competition of domestic leasing markets in the developed countries, the domestic market becomes smaller, and average profit margins begins to decrease. Leasing defi-

nitely creates a good opportunity to the overseas market which is just suitable for China to make use of foreign capital, and to absorb advanced technologies.

3. Since currently the commercial market in China is still immature, the development of the leasing market is quite limited. Most of the leasing companies especially Joint Ventures only deal with overseas business.

4. Overseas leasing organizations usually only take charge of circulating necessary funds. They do not pay much attention to the purchasing facility. But the leasing business in China sufficiently takes on the roles of financing and trading. They contact factories, price the facility, help the clients compare the price and go through the steps of the importing processes. Sometimes they connect the commodity sales channels as well. It makes the Chinese leasing business a real economic activity which is composed of financing and trading.

5. The leasing industry in China is strongly political and must obey the general policies of the government. Nowadays financial leasing is mainly used for improving the technology and reputation of the companies.

In 1996, in the top 50 global leasing markets China ranked 24th. The annual leasing line was about USD1.6 billion, but the total line was close to USD428.1 billion. The most developed leasing countries are in North America and Europe with leasing balances of USD177 billion and 118 billion respectively. Japan and Korea are also well developed, having about USD71.4 billion and USD16.3 billion respectively, ranked in the 2nd and 5th places. The other evaluating target is the leasing infiltration ratio (the ratio of new lease and full new fixed investments of factories). The developed country is normally above

15%, US is the highest which is 31%. According to the above data, in the economic view, the leasing business in China is still small, but it has a huge developing potential.

The leasing industry in China can be divided into three parts:

1. Capital leases and operating leases offered by capital leasing companies from the Peoples Bank of China (PBC), the central bank. There are about 12 leasing companies of this kind;

2. Capital leases and operating leases offered by Sino-foreign joint venture leasing companies run by the Ministry of Foreign Trade and Economic Cooperation. There are more than 40 leasing companies of this kind;

3. Operating leases offered by Chinese leasing companies whose management rights have been passed from the former Ministry of Internal Trade to the State Economic and Trade Commission (SETC). There are more than 1000 of this kind.

There are some major reasons for the stagnant leasing industry: poor operation management, expansion without purpose; lessee is in arrears with the leasing payments; society lacks identification with the leasing industry, and the leasing market lacks developing space. However, the most important reason, in decades, is that China lacks specific policy rules to standardize and guarantee their businesses, which radically limits this development. Through concluding and supplementing, PBC published the "Methods of Financing Leasing Company Management" in the year 2000, which has greatly inspired the development of the leasing market. It solves plenty of puzzling problems that existed for a long time. It allows companies to publish financial bonds, to borrowing financing capital from other commercial institutions, and to absorb

the leasing bail of lessees. It also stipulates that the leasing business must obey a series of provisions of the management of asset and debt ratios. It provides that the leasing ratio cannot be less than 60%, total capital cannot be lower than 10% of the total risk capital. In order to avoid the risk, it limited the excess expenditures of companies, that is, the financing balance of a lessee cannot exceed 15% of total capital for the leasing company, and long-run investments cannot exceed 30% of total capital, etc. It guarantees safety to the leasing companies.

Chapter 7

Influence of Bank as Leasing Organization With Application in Telecommunication Market

Telecommunication industry is the largest industry in the world, it plays an important role in both business life and daily life. It continues on its quickly increasing trend and continuously introduces innovative products and services that meet consumer market demands. Due to the completion of the market system and fast development of The telecom business, the financing methods for telecom corporations keep changing from simple to complex, from individual to multiplicity.

Therefore, we need to pay attention to the leasing business in the Telecom industry. There are plenty of leasing advantages. Currently, there are more and more people using mobile devices, even though the popularization ratio is not as high as that of developed countries. But the population of mobile customers in China is the largest compared globally. In 2004, the number of mobile customers already exceeded 3.54 million. According to the

statistics, the number of fixed telephone lines is about 3.29 million, and the popularization ratio is gradually increasing to 25.9%. Until the end of April in 2005, the revenue for Telecommunication operations was RMB203 billion (USD25 billion) which increased 9.5% compared to 2004. Consequently, telecom profitability has reached RMB185 billion (USD23 billion). Moreover, fixed telephone lines are in high demand now, for instance, long-distance telephone calls require a high level quality. Also the Internet has become an essential part of daily life, thus telecom has quite a huge potential in the market of China.

In the Telecom industry, the lessee needs up-to-date high-tech facilities, because companies are facing risks of being eliminated by the market. Innovation in technology is an essential issue for survival. Companies can introduce innovative technology much faster by leasing, and making payments and producing goods at the same time. By leasing, they can quickly import assets. Banks can be the leasing company by using their current capital to pay for assets for lessees, since the lessee firms cannot pay immediately, they have to collect enough funds from their own capital or from banks. Next, we will consider the case when the bank is the lessor.

7.1 Positive Sides to Banks through Leasing

After signing the leasing contract, according to the leasing terms provided in the contract, the lessee has to maintain a symbiotic relationship with the bank for the duration of the contract. The bank gets continuous income from the leasing. If the lessee has excellent credit (excluding other risks), then the bank will not be worried about getting back its full investment. However, it does not mean that the longer the term, the better it will be. Banks can set the

leasing interest rate on their own, which is based on the other elements of the leased asset, e.g. its price or quality. If it is a short-term lease, by setting the interest high, the lessor can take back the investment within a short period of time; otherwise, they can set a low interest rate if it's a long-term lease. But there are some problems that need to be addressed, for instance, the yield of the lessee has to be greater than the rental interest rate. Moreover, it doesn't mean that the bank prefers to sign only long-term contracts or only short-term contracts, it should depend on the industry. If the industry always updates quickly, usually short-term leasing is preferred and the deal lasts about 2 to 4 years, like in the telecom industry. On the other hand, if it is the real estate business, the leasing period would last 20 to 30 years.

It is also worthy to note that banks can repay the asset supplier by flexible repayments, i.e. they can use the installments from the lessee to repay to the equipment suppliers.

7.2 Negative Sides to the Banks

Besides the above advantages, there are still some negative sides for the leasing companies. With the telecom industry getting more and more popular and updated so fast, in order to remain in the market, the prices of the internet and mobile devices have to be lowered. To show that the telecom technology has evolved very quickly we can look back at the history of wireless communication. 1G started from 1985, then 7 years later, 2G came into the world, then 3 years later 2.5G and then 3G eventually came into the market in the year of 2002. With this accelerated rate of growth, it shows that technology is developing incredibly fast right now. Thus companies must follow or even exceed this technological evolution. They have to update their equipment and technology

frequently, which may result in the fact that the leasing business in telecom may not last a long time because of the above reasons.

Moreover, there is a risk when predicting the future market. For instance, when doing the research, the prediction of the anticipated sale might be 15%, but after a few years in reality, the real percent would have dropped fast to 7%. Then there will exist the risk that the lessee will not get the previously expected profit. In that case, the lessee may not have the capability to repay the bank. Thus in order to avoid this risk, the bank should make a short-term contract for taking back the investment in a short period of time. Moreover, based on that, if a long-term contract is signed or the lessee by accident was eliminated during competition of business markets or maybe due to other reasons, the bank will bear the risk. Therefore, like the high technology industry, short-term contracts will be better for banks.

Due to fast development, the equipment has the high possibility of being eliminated. In that case, if the lessee refuses to pay the leasing payment or they don't want to continue the contract on the current equipment, the asset (equipment) will belong to the bank. Therefore, the scrap value of the equipment will no long have a usage value due because of depreciation. Thus, the problem left to bank is that they have to deal with the remaining assets. Therefore, the bank has to carefully inspect the current industry leasing market.

To explore the issue of whether leasing is attractive for banks is quite complex. Generally speaking, there are four main problems that need to be addressed. Firstly, from the view of market, contrasts of different industries or macroeconomic markets, fast developing or slow developing industries, these each have essential distinctions. Banks need to perform detailed analysis of the industry and decide about whether to take chances to lease and how long that

lease should lasts. The most attractive thing is whether this industry has a bright future. Based on that, the trend of interest rates must be viewed as another important element to measure the economic situation of the market. It is directly related to the term structure of the leasing contract. If the interest is increasing, then the bank will ask for a higher lease rate in the contract, and vice versa. Moreover, the most significant element is the credit of the lessee company and the industry supplier. They should have a stable and reliable financial statements of profit and cash flows, etc.. It would be the best if the bank could deal with the monopoly corporation. In brief, banks should carefully investigate the credit of the other parties in the contract as well. Last but not least, from the view of bank, they usually have solid abundant resources and tremendous financial backgrounds. For instance, international banks are usually dealing with corporations ranked in the top 500 in the world working with experienced and excellent cooperation relationships. Banks should consider leasing business as a good chance for them to make more profit and enlarge their business at the same time. Besides that, in order to operate well in the leasing business, they should train their staff in leasing knowledge, including the financial, legal and other professional issues.

Generally speaking, the current economic situation in China is still in an adjustment period. It is also facing the pressure of increasing inner needs and investments. In the developed countries, leasing is the second highest financing instrument, second to the bank credit loans.

Chapter 8

Conclusion

In the essay, we first gave the general definition of financial leasing and lease market structure, along with its characteristics including advantages and possible risks. There has always been the puzzle in the lease-versus-buy decision. Based on that, the tax issue of Myers, Dill and Baurista (1976) are briefly stated, firstly, by comparing leasing with purchasing from accumulating capital; secondly, by comparing them to bank loans.

Moreover, the most important part is how to value the asset in the lease contract. Grenadier (1995) uses the original method of the value of a real-option approach. The term structure of the lease rate is endogenously derived by the option approach without considering the issue of credit risk. The model provides the rents prior to the actual payment period, and gives the economical intuition behind that. It was analyzed from the shape of the yield curves, for instance, when new supplies come into the market, the yield curve is downward sloping. To emphasize more on the credit risk, Grenadier (1996) again introduces the equilibrium lease rates under the situation of default risks. Besides, the credit risk spread was also analyzed and the relationships of risk spread was plotted against different parameters.

In the real world, We analyze the Chinese leasing market with its practical characteristics and current problems of slow-development with support of real data. Moreover, lease financing in the industry markets is applied by taking the telecommunication industry as the example. The pros and cons are addressed regarding the situation when banks prefer to participate as the leasing organization.

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