

## **An in-depth discussion of risk management in financial markets**

**Haoran Wen**

Accounting School, Shanxi University of Finance and Economics, Taiyuan, China

**Keywords:** Interest rate risk, ‘over the counter’ market, Exchange traded instruments, Exchange rate risk, Forward contract

**Abstract:** This paper gives an in-depth discussion aiming at the risks which will be discovered in the financial markets. The risks are an important component existing in the financial markets, so the risk management is very important, this paper considers the two main risk: interest rate risk and exchange rate risk. Aiming at these risks, there are some risk management methods, including internal and external method to manage and minimum the financial market risks.

### **1. Interest rate risk**

#### **1.1 Definition**

Interest rate risk refers to the risk of adverse movement in interest rates and thus a reduction in the company’s net cash flow. Interest rate risk is not faced solely by companies with debt liabilities, but also by companies with debt investments.(adverse interest rate movements means that the loan interest rate increase and deposit interest rate decrease).

Whatever we borrow or lend (investing) using a floating rate or fixed rate, there is interest rate risk exposure, the floating rate means the cash flow risk, and the fixed rate means the opportunity risk.

#### **1.2 Types of interest rate risk**

It represents more subtle types of interest rate risk exposure that companies may encounter

##### **1.2.1 Basic risk**

A company may have assets and liabilities of similar size, both with floating interest rates, and so will both receive and pay interest. It seems not have any interest rate risk exposure. However, the two floating rates may not be determined using the same basis. For example, one may be linked to LIBOR but the other is not. The two floating rates may not move by exactly same amount.

LIBOR: London Inter-Bank Offered Rate, is the rate of interest applying to wholesale money market lending between London banks.

Basic risk often happens in a future hedge position, the interest future rates do not normally move by exactly the same amount as the cash market rates, the difference being the basis risk.

##### **1.2.2 Gap exposure**

The assets and liabilities of a company which may be matched in terms of size, and the floating interest rates on each are determined on the same basis. However, it is still possible for interest rate risk to exist as the rates on liabilities may be revised on a 3-monthly basis, where the rates on assets may be revised on 6-monthly basis.

### **1.3 The cause of interest rate fluctuations**

The causes of interest rate fluctuations include the term structure of interest rate yield curve and changing economic factors.

The term structure refers to the way in which the yield on a security varies according to the term of borrowing. Normally, the longer the term to maturity, the higher the rate of interest. This is called normal yield curve. Occasionally, interest rate may be higher for short-term maturities than longer-term maturities. When this happens, there is a negative yield curve.

There are some theories to explain the interest rate fluctuations:

**Expectations theory.** The normal upward sloping yield curve reflects the expectation of future changes in interest rates. If interest rates are expected to rise in the future, the yield curve will slope upwards. When interest rates are expected to fall, short-term rates might be higher than long-term rates, and the yield curve would be downward sloping.

**Liquidity preference theory.** Investors have a natural preference for more liquid(shorter maturity)investments. They will need to be compensated if they have deprived of cash for a longer period. Therefore the longer the maturity period, the higher the yield required leading to an upward sloping curve, assuming that the interest rates were not expected to fall in the future.

**Market segmentation theory.** This theory states that there are different types of investors who are interested in different segments of the curve. Typically, bank and building societies invest at short end market, while pension funds and insurance companies invest at long term market. Market segmentation theory explains the “wobble” seen in the middle of curve where the short end of the curve meets the long end. In short-term market, the investor require a lot compensation to persuade them to tie up their money, therefore steep curve appears. But in the long-term, investors prefer more insurances on their investment, therefore flatter curve.

## 1.4 Interest rate risk-management

### 1.4.1 Internal method

**Matching.** Is where liabilities and assets with a common interest rate are matched.

**Smoothing.** Is where a company keeps a balance between its fixed and floating rate borrowing. A rise in interest rates will make the floating rate loan more expensive but this will be compensated for by the less expensive fixed rate loan.

**Asset and liability management.** This method will be illustrated by an example as follow.

Suppose a company is earning 6% on an asset supported by a liability on which it is paying 4%. The asset matures in two years while the liability matures in ten years. In two years, the firm will have to reinvest the proceeds from the asset. If interest rates fall, it could end up reinvesting at 3%. For the remaining eight years, it would earn 3% on the new asset while continued to pay 4% on the original liability. To avoid this, companies attempt to match the duration of their assets and liabilities.

### 1.4.2 External method-interest rate derivatives (table 1)

Table 1 External method-interest rate derivatives

<b>‘Over The Counter’ Market</b>	<b>Exchange Traded Instruments</b>	<b>Purpose</b>
FRA-Forward Rate Agreement	Interest Rate Future	To lock the company in to a target interest rate. To hedge both adverse and favorable movements.
IRG-Interest Rate Guarantee	Interest Rate Options on Futures	To protect the company from adverse movements and allow it take advantage of favorable movements
Interest Rate Swaps		To hedge medium to long term interest rate movements.
Interest Rate Collar		To keep interest rate between upper and lower limit.

**Forward rate agreement.** To lock the company in to a target interest rate, to hedge both adverse and favorable interest rate movements is its objective.

The FRA is a totally separate contractual agreement from the loan itself and could be arranged with a completely different bank. As an over the counter instrument they can be tailor-made to the company’s precise requirement and enable company to hedge for a period of one month up to two years.

**Interest Rate Guarantees.** An IRG is an option on a FRA. Like all options, it protects the company from adverse movements and allows it take advantage of favorable movement.

Its decision rules are that if there is an adverse movement, the company will exercise the option to protect, while if there is a favorable movement, the company will allow the option to lapse.

**Interest Rate Swap.** An interest rate swap is an agreement whereby the parties agree to swap a floating stream of interest payments for a fixed stream of interest payments and via versa. There is

no exchange of principal.

Swaps can be used to hedge against an adverse movements in interest rates and a swap can be used to obtain in cheaper finance. A swap should result in a company being able to borrow what they want at a better rate under a swap arrangement, than borrowing it directly themselves.

**Interest Rate Collar.** Is the combination of a floor and a cap and it is used by a company wanting to keep an interest rate or exchange rate between upper and lower limit. It is cheaper than using caps or floors on their own.

**Interest Rate Future.** A future contract can be defined as an agreement to buy or sell a standard quantity of a specified financial instrument at a future date at a price agreed between two parties.

Interest rate future are instruments that change as interest rates change, that an investor can buy today and sell later(or sell today and buy later). It is a binding contract to buy or sell a specified quantity of interest rate future. It is a standardized contract. Interest rate futures are not quoted as actual interest rates, but as number which is 100-interest rate.

The objective of future is to lock the company into the effective interest rate. To hedge both adverse and favorable interest rate movements.

When a futures contract is bought or sold, the buyer or seller is required to deposit a sum of money with the exchange, called initial margin. If losses are incurred, the buyer or seller may be called on to deposit additional funds(variation margin)with the exchange. Equally, profits are credited to the margin account on a daily basis as the contract is 'marked to market'.

And the additional notes are that: futures can only be dealt in contracts of fixed amounts. In practice the change in futures price will not exactly equal to the change in interest rates-the difference being the basis risk.

The previous two points mean that it is unlikely that we will end up with a perfect hedge.

**Interest Rate Option.** It gives the holder of the right but not obligation, to buy or sell an agreed interest at a future maturity date(the expiry date for the option)

A call option gives the holder the right to buy the future contract.

A put option gives the holder the right to sell the future contract.

This instrument needs to pay the premium of option in advanced.

## **2. Exchange rate risk**

If a foreign currency depreciates it is simply worth less in the home currency.

Towards receipt, this is an adverse movement and will receive less in the home currency.

Towards payment, this is a favorable movement and will end up paying less in the home currency.

The major technique to manage risk. Forward contract. This is contract you can lock an exchange rate today for buying or selling a specified currency in future. There will have two markets: the spot market is where you can buy or sell a currency now(immediate delivery); the forward market is where you can buy and sell a currency, at a fixed future date for a predetermined rate.

This contract can be tailored to user's exact requirement. The tender will know in advanced how much money will be received or paid and payment is not required until the contract is settled.

However, this method also some drawbacks, for example, the user may not be able to negotiate good terms, the price may depend on the size of the deal and how the user is rated, the user have to bear the spread of the contract between the buying and selling price and forward contract may not be available in the currencies that the customer requires.

**Money Market Hedge.** If the company is hedging a payment you buy the present value of foreign currency amount today at the spot rate. This results in an immediate payment in sterling. The foreign currency which you purchased is placed on deposit and accrues interest until the transaction date. Then the deposit is used to make the foreign currency payment.

The advantage of this method is that the company do not have to worry about any future adverse movement because the company use today's rate.

The disadvantage of this method is this approach has obvious cash flow implications which may

prevent a company from using this method.

### **3. Conclusion**

In the financial markets, the risks are an important component and risks can not be eliminated, the entity can use financial instruments to avoid and minimum these risks. These method including internal and external method to hedge risk, help company to manage risk and control the risks level in a reasonable level in the financial market.

### **References**

- [1] Walter V Little haslett, et al. 2017. Risk management.
- [2] Lijian, et al.2019. Risk management and internal control theory and practice .
- [3] John C.Hull, et al. 2018. Risk management and financial institutions.
- [4] Libin,et al. 2019. Corporate strategy and risk management.