The Evolution of Foreign Bank's Entry into China from the Aspect of Real Option

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Abstract

According to real option theory, the ability to obtain investment opportunity, the current cash flow and the uncertainty may affect the investment timing. This article analyzes the evolution of foreign banks entry into China according to real option. China's authority can defer or accelerate the foreign banks' expansion through its influence on investment opportunity, current cash flow, uncertainty faced by foreign banks.

1. Introduction

Foreign banks have become an indispensible part in China's banking. In the end of the year of 2006, China carried out "legal-person-bank orientation policy". Foreign banks can operate almost the same business as Chinese local banks once they have restructured from parent bank' non-legal-person branches into legal-person banks registered locally in China. And accordingly, in 2007, 274 branches of foreign banks have established, which is 22.32% more than that in 2006. But from then on, the increment speed decrease. H. Zhang (2009), H. Xue (2011), T. Xue (2013) explain the reasons of the evolution of foreign banks' entry from the aspect of "motivation" and they ignore the view of "timing". Foreign banks will influence China only when they have really entered. And the entry of action is influenced directly by "timing" and indirectly by "motivation". This article will explain the evolution of foreign banks' entry into China from the aspect of "timing". Real option method is a good way to solve the problem of timing. Stewart Mayers (1977) put forward the conception of "Real option" firstly and "real option" obtain its wide attention after 1994 when Dixit and Pindyck published their famous book "Investment under Uncertainty". In 1991, Smets begins to use game theory to analyze real option problems which is called "option game". Real option method is widely used in investment timing problems in kinds of areas. In the area of foreign banks' entry, Rivoli and Salorio (1996) testifies that ownership advantage, internalization advantage and the location advantage(OIL advantages) may defer the entry of foreign banks according to real option theory. Josep Garcia Blandon (2001) analyzes the influence factors on foreign banks' entry timing according to the conclusion of Rivoli and Salorio (1996) using the data from Spain. S. Ding (2012) testified that the traditional real option method is suitable to analyze the entry timing of foreign banks into China. And this article will use the traditional real option theory to analyze the evolution of foreign banks' entry into China. This article is arranged as following: the second part is the introduction of the traditional real option model and the influence factors; the third part is the explanation of the evolution of foreign banks' entry into China; the last part is the conclusion.

2. The Real Option Model and the Influence Factors

An investment opportunity give the investor the right to decide whether to implement the invest in a certain period of time, which likes the financial option, therefore this investment opportunity is called real option. If the investment is irreversible and deferrable, the investor can wait or invest right now. If the investor invest right now, (s)he will lose the invest opportunity and the value of the investment will be the opportunity cost for the investment right now.

Suppose the investment is irreversible and deferrable, according to Dixit and Pindyck (1994), the option value for and investment $F(V)$ and the trigger value for and enterprise to carry out its investment V^* is as following,

$$F(V) = AV^{\beta} \tag{1}$$

$$V^* = \frac{\beta_1}{\beta_1 - 1} I \tag{2}$$

$$\beta_1 = \frac{1}{2} - (r-\delta)/\sigma^2 + \sqrt{[(r-\delta)/\sigma^2 - \frac{1}{2}]^2 + 2r/\sigma^2} > 1 \tag{3}$$

$$\beta_2 = \frac{1}{2} - (r-\delta)/\sigma^2 - \sqrt{[(r-\delta)/\sigma^2 - \frac{1}{2}]^2 + 2r/\sigma^2} < 0 \tag{4}$$

where V is the investment value which satisfy $dV=aVdt+\sigma Vdz$, a is value-increasing rate, σ is the current cash flow once the investment is carried out immediately, the sum of a and δ is equal to a certain rate of return which is the same for the all investments, r is the riskless interest, σ is the uncertainty and I is the investment cost.

If $V<V^*$, the best choice is to wait and see. But once $V \geq V^*$, it is better to invest right now and accordingly, $F(V)=V-I$, which means that the investment value is $V-I$.

According to formula (1) to (4), the investment value and the trigger value is influenced by the uncertainty, current cash flow, riskless interest rate and the investment cost. In order to describe the influence of these factors more directly, figures are used where the initial condition is supposed to be $I=1$, $r=0.4$, $\delta=o.4$, $\sigma=0.02$. Figure 1 to Figure 2 shows the effect where the strait line represent $F(V)=V-I$ and the trigger value of V^* is the value of V correspond to the tangency point of $F(V)$ and $F(V)=V-I$.
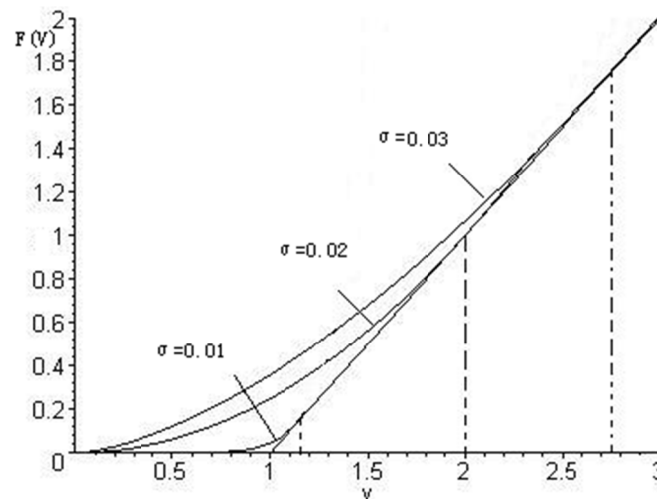

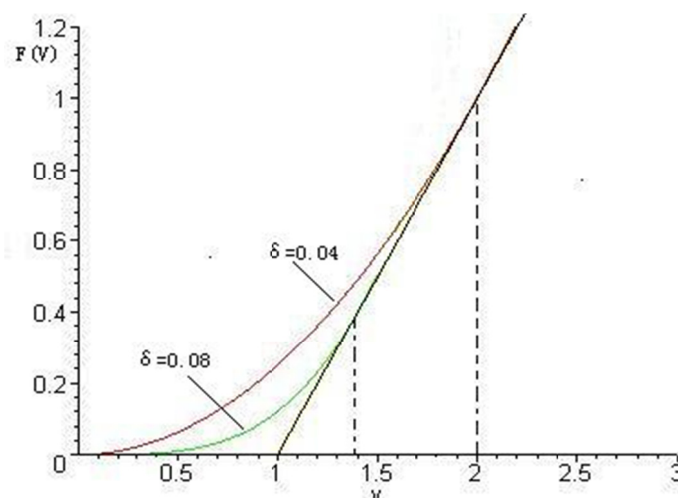Figure 1. Influence of uncertainty to $F(V)$ and V^*

Figure 2. Influence of current cash flow to $F(V)$ and V^*

According the formula (1) to (4), especially to Figure1 and Figure 2, the following two conclusions can be made.

Firstly, the higher the uncertainty is, the more impossible to invest immediately. When uncertainty is higher, the investment's value *F(V)* will be higher as shown in Figure1. Once the investment is carried out, the investor will lost the opportunity to choose the best timing to invest in the future and therefore *F(V)* will be the opportunity cost of the investment right now. When the uncertainty is higher, the investor will obtain more when the market is booming and still obtain zero (Note 1) when the market is in recession, and generally speaking, the value of the investment is higher and therefore the opportunity cost to invest immediately will be higher and the investor is inclined to invest later, which can also be shown from the position of *V**. When the uncertainty is higher, the trigger value *V** will also be higher which means that the investor should invest later. When the investor is more inclined to invest later, the investment carried out today will be less.

Secondly, the higher the current cash flow is, the more likely to invest immediately. When the current cash flow is higher, the value-increasing rate *a* will be less and the value of the investment *F(V)* will be less and the opportunity cost of investment immediately will be less. At the same time, the current cash flow is the opportunity cost of waiting. So, when the current cash flow is higher, the investor is more inclined to invest right now.

If an investor has an opportunity, he can choose to invest right now or wait to see. And at a specific time point, the amount of investment is influenced by uncertainty in the future and current cash flow once (s)he invests immediately. But if (s)he does not have an invest opportunity, the investment volume at a specific time will be zero. Therefore there is the third factor, whether have an investment opportunity or not, that influences the investment volume of a specific time.

3. The Evolution of Foreign Banks' Entry into China according to Real Option

In 1978, China began to carry out the reforming and opening policy, and foreign banks began to enter China again. China opens its banking business to foreign capital gradually. In 1979, the first representative office of foreign bank set up. In 1982, the first business institution of foreign bank built up. Before the 1996, foreign banks were authorized to operate foreign exchange business. From 1996 to 2006, foreign banks have the right to supply wholesale RMB business to foreign enterprises in more and more experimental cities. In 2006, China opened its RMB retail market to foreign banks, but the loan-to-deposit-ratio for foreign banks can be higher than 75%, while that of Chinese local banks must be lower than 75%. In Dec.31.2011, the grace period became due and foreign banks must obey the rule that their loan-to-deposit-ratio must also be lower than 75% and from then on, foreign banks have the same supervision with Chinese local banks.

Table 1. Number of foreign banks in China from 1998–2013

Year	1998	1999	2000	2001	2002	2003	2004	2005
Assets(mil.RMB)	34.2	31.8	34.4	45	39.2	48.8	58.2	71.6
Growth Rate(%)	-	-7.02	8.18	30.81	-12.89	24.49	19.26	23.02
Year	2006	2007	2008	2009	2010	2011	2012	2013
Assets(100mil.RMB)	92.8	125.3	134.5	134.9	174.2	215.4	238	256.3
Growth Rate(%)	29.61	35.02	7.34	0.30	29.13	23.65	10.49	7.68

Resource: Almanac of China's Finance and Banking 1999-2013 and Chinese Banking Regulatory Commission Annual Report 2006-2013.

Table 1 shows the foreign banks' assets in China from 1998 to 2013. Generally speaking, the assets become more and more as time is going. In 1998, the assets were RMB 34.2 million, and in 2013, the number soared to 256.3, which is almost 8 times more than that in 1998. China's banking has opened more to foreign banks gradually and more foreign banks can have the opportunity to enter. When the areas foreign banks can enter becomes more and the business circle for foreign banks is enlarging, foreign banks can have larger market and the current cash flow may be larger which make the opportunity cost to wait become larger and promote foreign banks enter faster and the outcome is more branches built up and the assets became more. As China's reforming and opening policy keeps on for more than 30 years, foreign banks believe China may open more market to them with less restriction. Therefore future uncertainty faced by foreign banks is reduced and the value to wait is reduced, which will stimulate foreign banks to enter faster.

But from Table 1, the entry velocity is not evenly. In some years, a tremendous number of foreign banks enter, but in some other years, foreign banks may withdraw.

In 1999, the assets of foreign banks are RMB 31.8 million, which is less than RMB 34.2 million in 1998. There are some reasons for the decline from the aspect of real option. In June 1997, the government of Thailand gave up the pegging exchange rate regime and THB depreciated tremendously. The domestic problem of Thailand began its internalization and the crisis is contagious to other East Asian countries fast. In the year 1998, the crisis originated from East Asia become worth and spread to Latin American，Oceania，North America，Europe. And large number of capital fled away from the East Asia countries. China's foreign banks entry was also affected by this Asia Financial Crises. Many foreign banks from Asia could not have the ability to enlarge their international business in China because they are affected heavily by the Crises, which means they didn't have the ability to obtain the investment opportunity in China. And at the same time, the foreign capital and the export in China were reduced sharply during the Asia Financial Crises, which are customer resource for foreign banks in China and the current cash flow from these customers will decrease obviously. And as a result, the branches and the assets in China from foreign capital reduced in 1999.

In the end of 1999, the Asia financial Crisis end and Asian countries began to recover. The situation of world economic was typically good in the year of 2000. The average GDP growth rate of the world reached 4.8%. The growth rate of international trade in the world ran up to 12.4%. The good outside environment made the parent-bank have the ability to carry out investment once they had the investment opportunity. In China, 2000 was also a year of fast growth. China's "domestic demand expansion policy" began to manifest its favorable effect and the decreasing trend for almost 7 years had ended and the GDP growth rate in 2000 reached 8%. For foreign banks, if they enter, the good macro-economic situation may give them high current cash flow, which may enlarge the opportunity cost to wait. As a result, in the year 2000, foreign banks' assets reached RMB 34.4 million, which is 8.18% more than that of 1999. And encouraged by the good situation of 2000, foreign banks were optimistic for the future of China's market, and more foreign investment enter in 2001.

In the end of year 2001, China entered WTO successfully. China would open more to the world. But in the following year 2002, the assets of foreign banks reduced sharply. In the year 2001 and the following year 2002, the economic growth was weak in USA, Europe and Japan. And the international direct investment decrease largely. The parent-banks of foreign banks in China did not have the ability to increase investment in China. At the same time, although China has entered WTO, but there are five years to protect domestic banking, and China banking had not opened too much to foreign capital, which means that foreign banks had not obtained much more investment opportunity and the current cash flow did not increase much. Besides, foreign banks were not sure about which kind of entry mode was preferred by the authority, which mean that they have much uncertainty about the entry mode which encourage foreign banks to wait and see.

From the year 2003 to 2007, foreign banks entered China fast. From 2003, world economy performed well. In the year 2003, the world economy began to recover, and the average GDP growth rate all over the world was 3.9%, which was 0.9% percent higher than that of the last year. Asian economy performed the best. After 2003, the world economy still performed well. The average GDP growth rate of 2004, 2005 and 2006 were 5.1%, 4.8% and 5.4% separately. The good outside situation gave the parent bank the ability to use the investment opportunity in China. China's economy also performed pretty well in these years. In the year 2003, China's economy developed fast despite the unfavorable effect of SARS. The GDP growth rate was 8.35%, which was the highest since the 1997 Asia Financial Crisis. In the year of 2004, 2005, 2006 and 2007, the GDP growth rate in China was 9.5%, 10.7%, 10.4% and 11.9%. The good domestic economic situation means that foreign banks can earn considerable current cash flow, which may prompt them to enter as fast as possible. The long time of prosperity in both outside domestic economy made the foreign banks more pessimistic about their profit and the future uncertainty reduced which also prompt them to enter fast. Besides, China's banking indeed opened more to foreign banks which reduced the uncertainty faced by foreign banks. In the end of 2003, foreign banks can supply RMB services to Chinese enterprises gradually when more and more cities are opened to foreign capital. In the end of 2006, the five years protection period ended, China's retail RMB market opened to foreign capital, which means foreign banks may have larger market and more investment opportunity. Therefore, foreign banks entered China fast in 2003 to 2007.

In the year of 2008 and 2009, the velocity for foreign banks to enter China decreased obviously. The main influence is the world-wide financial crises deduced by the subprime mortgage crisis begin in 2007. Many financial institutions were affected. At the same time, China's economy was also lightly affected by the financial crises. The GDP growth rate in 2008 and 2009 were 9% and 8.7%. As a result, the velocity for foreign banks to enter China decreased.

From the year 2009, the world economy recovered gradually. China GDP growth rate in 2009 and 2010 recovered to 10.4% and 9.2%. And in the two years, foreign banks entered still very fast. But from 2012, the

velocity reduced again. In fact, foreign banks do not develop well in recent years. Since the end of 2006, foreign bank can engage in RMB retail business and they are full of hope to this market. But they feel more and more difficulties in competition with Chinese local banks. In the initial years after 2006, Chinese people were curious about foreign banks and foreign banks were not difficult to obtain customers. But several years past, Chinese people are not such curious about foreign banks as before, and foreign banks' branches were far less than Chinese local banks, deposit and therefore the loan is less. Hong Kong and Shang Hai Banking Corporation (HSBC) is the foreign bank that has the most branches in China. In the end of 2013, it has 135 branches and sub-branches in China, but at the same time, Industrial and Commercial Bank of China (ICB) has 17245 branches and sub-branches. Some foreign banks began to withdraw from China, for example, Deutsche Bank, Royal Bank of Scotland Group, OCBC Bank. Besides, foreign banks are not sure about the future of Chinese economy when China is adjusting its industrial structure. The difficulties faced by foreign banks in China reduced the current cash flow and defer the foreign banks investment. The uncertainty about the Chinese economy future increase the opportunity cost to invest now, which also defer the investment from foreign banks. So in recent years, the velocity for foreign banks to enlarge is low.

4. Conclusion

According to the real option theory, uncertainty, current cash flow and the ability to obtain the investment opportunity affect the timing of investment. When China banking market opens more to foreign banks, foreign banks will have more investment opportunities and more of them may enter China. When the outside world economy is good, the parent-banks will have more ability to use the investment opportunity and more foreign banks will come into China. When China's domestic market is good, foreign banks will obtain more current cash flow and will come into China fast. When foreign banks face more uncertainty in China, for example, in the initial years after China enter WTO and recently when China is adjusting its economic structure, they will defer the investment. If China's authority wants to defer or accelerate the investment from foreign bank, it may affect the investment opportunity, the current cash flow and the uncertainty faced by foreign bank.

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Note

Note 1. When the market is in recession, the investor will not invest and obtain zero, no loss and no gain.

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