THE ROLE OF VENTURE CAPITAL IN THE BRIDGING OF FUNDING GAPS – A REAL OPTIONS REASONING

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Abstract: *Funding gaps occur when for a particular group of enterprises there are not enough available funds to finance their growth. Such enterprises are typically young, innovative and technology-oriented startup companies. These companies do not have significant revenues or collaterals; hence they are not suitable for bank financing. On the other hand the information problems decrease their chances to attract investors and also there is high uncertainty involved in these companies. The method of venture capital financing was established to operate in this financing gap and to provide funds for these technology-oriented, young startup enterprises. There is an extensive literature that highlights that venture capitalists are capable and willing to provide financing for these enterprises as a result of their special expertise and business experience and their sophisticated value creation methods. In this article the authors introduce a real options reasoning in order to give an interpretation of venture capital decision-making method and why venture capital is willing to operate in funding gaps and how it is able to bridge them. With the involvement in the operation of the invested companies venture capitalists create options that increase the value of the firm. Also in option-valuation the higher the uncertainty of the asset is, the higher the value of the option is. That is the reason, why other passive funding forms reject the financing of startup enterprises, while venture capital is willing to provide funds for them. In this article we will describe the problem of funding gaps, than we will introduce real options and their effect on investment decision. In the last part of the article we will demonstrate how real options appear and are created in venture capital financing as a result of its special characteristics and how the real options approach can explain the ability of venture capitalist of bridging funding gaps.*

Keywords: venture capital; real options

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1. Funding gaps and venture capital

We can define funding gaps as the hiatus of the supply and demand of financial sources (Nagy, 2004). Funding gaps occur usually in cases of companies in a given point of their life and with special field of activity. The problem of funding gap is prevalent in young, technology-oriented startup enterprises. As a result of the funding gaps, companies with huge growth potential are not able to obtain the necessary capital for their operation; hence they cannot live up to their growth potential.
Funding gaps evolve in case of startup companies as a result of their special characteristics. In the seed and early stages of their lives these companies are in the phase of product development or they have just made their market entry. They are in the lack of collaterals or significant revenues; hence they are unable to obtain bank financing. The capital structure of these enterprises affects their competitiveness and the dominance of loans in their capital structure would result in a heavy burden on their cash flows (Herczeg, 2009). On the other hand the 3F funds (family, friends and fools) are not sufficient to finance the further growth of these enterprises.

Also these companies have high risk and uncertainty. Becsky-Nagy and Fazekas (2015) discusses the special risks and the sources of uncertainty that plays an important role in case of young, innovative companies. There is a high business risk involved in startup companies. Cochrane (2005) showed, that in case of venture capital investments that aims innovative, young companies, the returns are strongly positively skewed that suggests that most of the companies generate low and even negative returns but few enterprises are able to reach extremely high returns. Cochrane (2005) also showed that the risk of these enterprises is company-specific idiosyncratic risk and not systematic risk.
The high uncertainty also derives from imperfect information. As these companies do not have a track record and their activity is specific it is difficult to evaluate them, hence adverse selection described by Akerlof (1970) occurs. Furthermore, as these enterprises need external financing the principal-agent problem described by Jensen and Meckling (1976) also occurs and the uncertainty derives from this relationship contributes to the funding gaps as well.

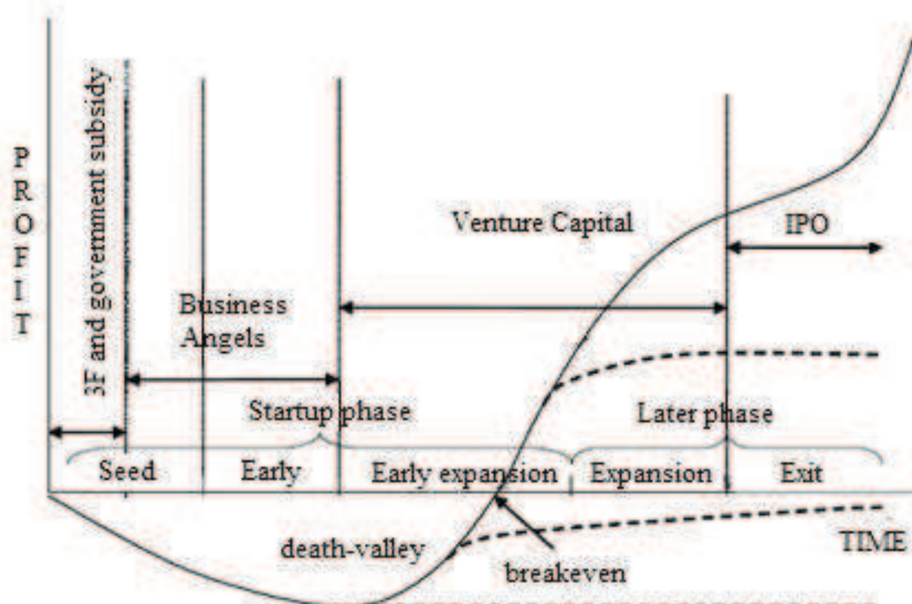

Figure 1: The available equity-funding for young enterprises in their different stages of growth
Source: Szerb (2006)

As we can see on Figure 1, venture capital is the main external funding source of enterprises. Venture capital appears in the early stages of the life of companies when they are generating losses and the faith and viability of the company is doubtful. In the so called death-valley, before the market entry the uncertainty of these enterprises is high, but provided that adequate capital and knowledge is available for these enterprises they can achieve high growth rate and reach the point where an IPO is feasible.

2. Basics of real options reasoning

The role of uncertainty plays a crucial role in option valuation. In the traditional investment analyses methods the higher the uncertainty is the lower the value of the investment is. On the other hand in options valuation the higher the volatility of the underlying asset is the higher the value of the option is. The reason of this relationship of volatility and options is,

that in case of options the losses are limited (we do not exercise the option, when it is out of the money so we only lose the price of the option), while in case of favourable changes in the price of the underlying asset we can gain profit (in case of put option, the maximum of our profit is the strike price, while in case of call options the profit is unlimited in theory). Volatility increases the value of options because the downside risk and the probability of loss are eliminated while the chance of high profit increases.

The role of uncertainty appears similarly in case of real options. In an uncertain business environment the management of the company has the ability to react to the changes of the environment and the occurring problems and possibilities. The traditional DCF (Discounted Cash Flow) based investment analyses methods are not able to incorporate the value of managerial flexibility into the evaluation, although in strategic investments this flexibility of the management can increase the value. Rózsa (2004) based on the literature describes the following options that managers may have in the implementation of an investment:

- deferment
- rejection
- expansion
- staging
- switch
- alteration
- learning

Real options integrate the traditional DCF based evaluation methods with option valuation and provide a strategic approach of investment analyses where the value of the management flexibility appears. Figure 2 shows how real options change the DCF based NPV's (Net Present Value) distribution.

As we can see on Figure 2, the presence of options changes the distribution of NPV in two ways. First of all, the expected value of the investment increases as a result of the added value of the options. On the other hand the distribution will be positively skewed. The reason of the changed skewness is that options can mitigate losses and enhance the positive outcomes. The design of the option allows its holder to benefit from uncertainty in the occurrence of favourable events (McGrath, 1997).

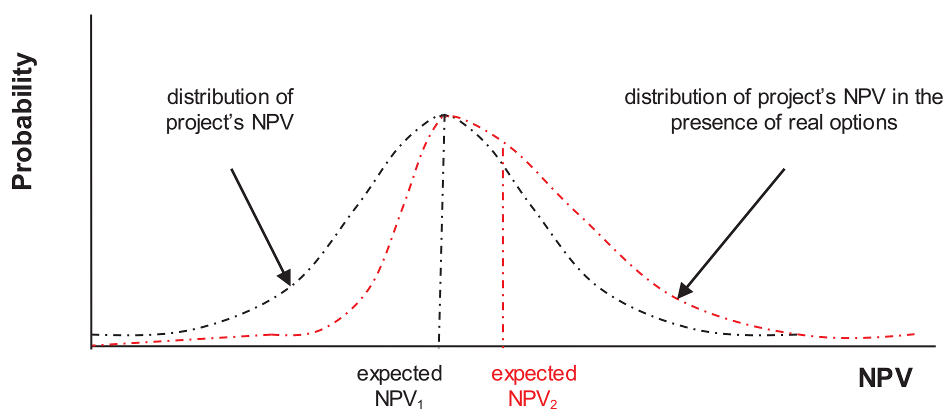

Figure 2: The effect of real options on the distribution of investment's NPV
Source: Yeo, K. T. and Qiu, F. (2003)

3. The role of real options reasoning in venture capital financing

Compared to other funding forms venture capital is willing and more successful in managing risks and uncertainty. The literature explains this feature of venture capital with the special expertise and business experience of the venture capital investors that enables

them to increase the value of the firm in order to realize profit via exiting the invested companies (Becskyné Nagy, 2006). As they provide equity type financing, the investors become owners of the invested companies and as owners their priority is to maximize their wealth via increasing the firm's value (Rózsa and Tálas, 2012). As a result of their expertise they can select the invested companies more efficiently and they can also provide non-financial value added services after the investment in order to increase the value of the invested companies (Chemmanur et al., 2011).

The real options approach of venture capital investments also relies on the special expertise of venture capital investors. Real options can be viewed as a decision-making method and valuation technique, a logic for strategic planning (Driouchi and Bennett, 2012). The reason why real options can be applied in venture capital investments is that the investors provide managerial assistance as well; hence they can influence the operation of the invested companies (Nagy, 2002; Becsky-Nagy, 2014). This feature of venture capital creates real options in the investments. As Copeland and Keenan (1998) shows, the uncertainty and the future opportunities of investments alone does not create real options. They emphasize the role of the management's capabilities to recognize the options. It is also crucial how effectively the management can respond to the changes of the uncertain environment. Miller (2002) also highlights the competence of the management as a determinant of the value of the options. Rangan (1998) describes that the value of options can be realized only if there is adequate knowledge, tools and resources.

Venture capital investors have the necessary expertise and knowledge to realize options. Venture capitalists establish their managerial networks in order to match enterprises with the suitable managers who have the necessary skills and business experience (Carvalho et al., 2005). The literature emphasizes the role of the invested company's management and according to many studies the management team of companies are more important in the investment decisions than the idea or the activity of the enterprises itself (Kaplan et al., 2009). These features of venture capital are consistent with real options reasoning as the knowledge provided by the investors and what makes it possible to utilize the options in the companies.

Venture capitalists use special methods and tools that allow them to create and take advantage of the options of investments (Becsky-Nagy and Fazekas, 2015). The practice of multi-staged financing is generally used by venture capitalists hence the option of staging occurs in these investments. Staging plays an important role in the risk management of venture capital. The first financing round can be viewed as a test period, where the investors can gather more information about the invested companies without committing the full amount of capital that is needed to the investment. Staging can mitigate losses in case of unviable companies while keeping alive the potentially successful ones.

Convertible securities are also widespread in venture capital financing as they can decrease downside risk of investments as they can function as debt-like financing if the value of equity is lower than the face value of the securities while in case of high equity value the securities can be converted hence the investors have the benefits of the increased value of the firm's equity (Hellmann, 2006).

Monitoring and participation in the operation of the company is also important in the real options approach. The information provided by the operation is crucial in the management of the companies (Fenyves et al., 2014), because the uncertainty connected to the invested companies is endogen to the enterprises and generated by the investment process itself (Rózsa, 2007). Monitoring is essential in order to be able to gather this information and react to the possibilities of the companies.

It is also important on the long run that each investment provide information for the investors so they become more experienced. The role of this information has high importance especially in a rapidly changing technical environment (Orbán Mrs. Tamás Dékán, 2013). Investors can harness this knowledge in their future investments and they

can increase their efficiency. That is the reason why learning options, described by Yeo and Qiu (2003) occur as well, because the knowledge gained by the investment process has value.
As it is discussed above, real options occur and are created in venture capital investments. If we apply real options reasoning to venture capital financing we can see why venture capital is willing to finance companies that other funding forms are not, and why venture capital can bridge the funding gaps. First of all, the options value increases the expected value of the investments; hence investments rejected by traditional DCF-based analyses methods will be accepted if we incorporate the value of options into the valuation method. The role of uncertainty in real options approach plays an even more important role. In options valuation volatility increases the value of options as the downside risk can be eliminated while the upside part of the volatility creates the chance of high returns. In the companies that are in the focus of venture capital financing there is a high uncertainty and that is the reason why most funding forms are averse to provide them capital. On the other hand, as venture capitalists are able to create and recognize options and they can realize the benefits of the high uncertainty while minimizing its negative consequences.

4. In conclusion

The young, innovative technology-oriented startup enterprises that bring novelty to the market often cannot obtain capital in order to finance their growth, hence funding gaps occur. As a result of the high degree of asymmetric information and uncertainty in these companies the more risk averse funding sources are not willing to provide capital for them, on the other hand venture capital has a unique approach towards risk that can be described via real options reasoning.
Via the involvement in the operation of the enterprises, special expertise and risk management techniques venture capitalist can create and utilize options in the investments. Real options reasoning gives an explanation of venture capital's investment activity and why this funding form is willing and able to bear and manage higher risks more efficiently than other funding sources. In options reasoning the higher volatility of investments become a favourable feature and that is the reason why venture capital provides primarily funding for startup enterprises and why venture capital can bridge funding gaps.

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