

# Valuation model using a mixed real options method: a review on Singapore and Indonesia digital startups

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**ABSTRACT:** Startup is drawing a lot of attention given the growth potential for both entrepreneurs and investors. One of the important aspects of this venture is a fair valuation for both parties. Traditional valuation model such as Berkus comparison methods, risk factor summation, and even the usual Discounted Cash Flow (DCF) cannot address dynamic venture such as digital startups. It is because unlike traditional firms, there is no easy way to forecast cash flow in the initially loss-making company with no or limited financial data such as revenue or EBITDA. This paper is addressing potential applicability and issue with Real Options methods given its flexibility nature to adapt to many scenarios that are typically faced by a digital startup. Startups information from Singapore representing more mature developed country will then empirically be compared with data from Indonesia digital startups. The benefit of this article is to provide a better structured and scientific approach in valuing a digital startup given its dynamic and high uncertainty nature of it.

**Keywords:** startups, valuation model, DCF, Real options, risk analysis

## 1 INTRODUCTION

Valuing companies early in the life cycle is difficult and subjective, partly because of the absence of operating history, financial information and partly because most young firms do not make it through these early stages to success (Brealey, Myers & Allen, 2006; Damodaran Aswath, 2006, 2009; Goldman, 2008).

Digital startups scene in South East Asia is growing fast with more than \$10B investment value in 2017, dominated by Singapore and Indonesia (A.T. Kearney & Google, 2017). Success stories from overseas and Indonesia based unicorn startups such as Grab, Sea, Razer, Tokopedia, GoJek, and Traveloka have inspired many entrepreneurs. Indonesia itself has huge potential driven by the total population of more than 260 million people with more than 100 million Smartphone users that have caused rapid growth in the number of startups over the past few years (A.T. Kearney & Google, 2017).

The research shows that improper valuation strategy will lead to dissatisfactions among the founders and investor themselves, which would be a contributing factor towards the high failure rate of startups due to the conflict between the entrepreneur and the

investor (Zacharakis, Erikson & George, 2010). The authors will perform an exploratory study to understand the characteristic of the phenomena especially around the unique decision strategy of the investor to end up with the agreed valuation amount for early-stage digital startups in Singapore and Indonesia.

A startup is a business or undertaking that recently begun operation. This new venture typically has no history, untested products, unknown cost structures, unknown implementation timing, unknown market acceptance, untested market channels, unknown competition, unsophisticated management, and unrealistic expectations (Goldman, 2008). At the same time, there have been many cases of a big corporation such as Apple, Facebook and Microsoft, evolved from small technology startups without a proper business plan (Castrogiovanni, 1996).

Digital or technology-based startups have been showing a few common attributes such as fast growth, highly innovative, trying to reach the global market (Tanev, 2012), pose higher risk and typically rely on the major portion of the capital on the external source of funds such as angel investors and venture capital (VC) (Baum and Silverman, 2004). In addition to providing funds, VC would al-

so provide mentoring, extend their networks, and go to market strategy and even product development.

It is important, given these uncertainties, for investor to assess the potential of startups and select their investments. It is also equally important for startup founders to understand their company's valuation in order not to give away the portion of the company unnecessarily which would lead towards dissatisfaction and demotivation (Miloud, Aspelund & Cabrol, 2012).

## 2 RESEARCH METHODS

A typical digital startup would go through typical phases in their life cycles which is indicating the level of generated revenues, namely early stage (start-up or idea), rapid expansion, high growth, mature growth and finally declining stage. The growth rate of earnings (EBITDA) tends to follow revenues.

There are different characteristics being exhibited per startup stage hence there is no standard valuation method that would work all the time (Goldman, 2008). Certain valuation method would be more appropriate for specific startup life cycle depending on the availability of information (revenues/EBITDA, operating history, comparable firms and source of values).

For early-stage startups without sufficient financial data to rely on, both founders and investors have to use creative ways in substituting these inputs. At the early stage, the value of the company is more related to the growth potential as opposed to the present value (Bell, 2014).

Dave Berkus, an angel investor developed this method in mid-1990 by finding how a similar startup is worth. It then subjectively ascribes a certain amount of money depending on the progress of the startup on certain key characteristics as shown in Table 1. The pre-money valuation of the company is the total of the amount from all identified characteristics (Chatsios, 2016).

This method is only applicable for early stage (pre-revenue) startup as once the company starts making revenues, another method such as future cash flow would be more appropriate.

*The Risk Factor Summation Method* was designed by Ohio TechAngels and a slightly more evolved version of the Berkus Method. From the initial value of other similar companies, we then adjusted the pre-money valuation based on the 12 risk factors and risk scoring. While this method might be more comprehensive than Berkus method, it is still only applicable to early stage startups case and still exhibit a lot of subjectivity on this comparative method. *Discounted Cash Flow (DCF) Method* commonly used for startup valuation and based on Simple dis-

counted cash flow (DCF) formulas like the Gordon model (1962) which later was expanded by Harris and Marston (2000) and Fama and French (2002). DCF method can be used especially in the growth stage of startups once the revenue is generated hence the future cash flow (payoffs) can be forecasted, then using an expected rate of investment return.

*Basic Real Options Method*, the most common limitations of DCF method are the difficulty in estimating future cash flow, finding appropriate benchmark company, and the fact it cannot cater for the dynamic, flexibility, and uncertainty nature of digital startups (Gupta and Chevalier, 2002). For early-stage digital startup that requires initial investment such as for R&D, DCF value would be most likely to be a negative one which would discourage the investors (Putri & Fujiwara, 2015).

The real options approach borrows the idea of financial options theory coined by Myers (1984) for managing real assets such as company valuation (Trigeorgis, 1993). It fills the gaps left by more prominent method such as DCF (Tamayo-Torres, Ruiz-Moreno and Verdú, 2010). The options will give the taker rights (not obligation) to buy (call option) or to sell (put option) the underlying assets before or at the expiry date.

There are two basic real options approaches; the binomial decision tree model and the Black & Scholes model which would need the following parameters (Gupta and Chevalier, 2002). The base value of the firms (S) is the present value of the cash flows expected from the firm minus any additional cash flows if the real option is exercised.

The initial investment or premium (C) is the amount needed to start off the company before it is ready to launch the product to the market i.e. R&D cost. Time to maturity (T) is the period during which the option can be exercised. Volatility ( $\delta$ ) refers to the standard deviation of the returns on the underlying assets. Dividends (d) are the payments made to the shareholders. The risk-free rate ( $R_f$ ) is the yield on a riskless security with the same maturity as the duration of the option. The value of the company is the sum of the base value of the firms (S) and the value of the real options. While the basic real options method could cater the flexibility nature of digital startups (i.e. the option to expand, delay or abandon) and estimating the needed parameters is not an easy exercise (Gupta and Chevalier, 2002).

*Mixed Real Options Method* The authors argue the need to incorporate qualitative independent variables which might impact the parameters of the real options method. This mixed real options method is to minimize the subjectivity aspect in deriving the real options parameter (Hunt *et al.*, 2004; Miloud,

Aspelund and Cabrol, 2012). Industry growth rate of the startup: to be measured as percentage change of the revenue in the industry over the previous year which would indicate level of volatility ( $\delta$ ) (Miloud, Aspelund and Cabrol, 2012). Product or services uniqueness: It is one of the most important elements that is positively related to company performance and as it would set the entry barrier level to the market (Caves, 1972; Porter, 1980). This would correlate with time to maturity of the options (T). Background of the founders: The knowledge and experience of the startup's founders in the industry are significantly and positively related to company performance as most of the ideas of the venture based on the ideas developed in their previous jobs (Gimeno *et al.*, 1997). The level of experience in setting up similar venture previously is a predictor of new venture success (Muzyka, Birley and Leleux, 1996). This would give more confidence for the investor to invest in the premium or initial investment (C). Personal traits compatibility between founders and investor: it has been reported that as entrepreneurs gain more experiences in setting and running the startup, they tend to attach more importance to personal compatibility with the investors (Valliere and Peterson, 2007). This would also impact the premium or initial investment (C) parameter of the real options method.

### 3 RESULTS AND DISCUSSIONS

Based on a study commissioned by the Kauffmann Foundation, high-technology startups have created most of the new jobs from 2000 to 2010 in the US (Fairlie, 2012). Another study by A.T. Kearney and Google (2017) indicated that South East Asia (SEA) is the world's fastest growing internet region with an existing internet user base of 260m growing to ~480m users by 2020. Consequently, the SEA Internet economy is expected to grow to ~\$200+ billion by 2025 driven mostly by the growth of first-hand e-Commerce market, online travel, and fintech (financial technology). There are few growth-driving factors in SEA namely a burgeoning young population with ~70% under the age of 40, difficult access in remote islands like Indonesia and rapidly growing middle-class (forecasted GDP growth of 5.3% over the next 10 years).

Within SEA, Singapore remains the main hub in terms of startup development, but other countries are quickly catching up, with Indonesia leading the way. In 2015, Indonesia and Singapore comprised ~60% of the deal value of total \$10.1B investment made in 2017.

The authors will focus in analyzing digital startups from the main markets of e-Commerce, online travel and fintech for further research. As there are no official reports in terms of numbers of digital startups in SEA, the authors plan to use the information from crunchbase.com as secondary data sources to get the list of funded startups in Singapore and Indonesia. There are currently around 712 and 254 funded startups in Singapore and Indonesia respectively listed in crunchbase.com. The data will provide insights of valuation parameters and amount. Subsequent data collection on the qualitative independent variables will use the triangulation method by combining various data collection techniques from various data sources. The data studied will be taken using non-probability sampling techniques that emphasizes process to yield research output to gain the understanding of meaning (Sugiarto, 2017). List of questions will be prepared prior the interview by using mixed measurement scale techniques such as category and Likert scale. Structural equation modeling (SEM) will be used as analysis technique to analyze structural relationships among variables and latent constructs (Sugiarto, 2017).

### 4 CONCLUSION

The authors have provided comparison justification through this literature review on why typical valuation model such as Berkus model and even DCF would not be appropriate to deal with flexibility and uncertainty of a digital startup. Combining real options method with additional independent variables would provide better justification in deriving the more accurate company valuation of digital startups.

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