A Review of the Classification of Enterprise Life Cycle

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Abstract

Due to the different life cycles of companies, there are significant differences in company size, growth, financing constraints, financing channels, growth, investment opportunities, competitive environment, and operational and financial risks. The company's life cycle can be studied by micro-enterprises. Scholars in the fields of behavior, financial accounting, management accounting, and capital markets provide a dynamic perspective. Therefore, how to divide and measure the life cycle of a company is particularly important. This paper gives a detailed analysis of the division of the life cycle of domestic and foreign companies and their measurement methods. It has a certain guiding significance for interdisciplinary research in financial accounting, management accounting, and capital markets based on the enterprise life cycle theory.

Keywords

Eenterprise Life Cycle, Univariate Method, Comprehensive Index Method, Cash Flow Combination Method

1. Introduction

Just as the birth, growth, maturation and aging of life cycle of the organism, the enterprise organization also has its own life cycle, from the creation, to the continuous development and growth, to maturity and stability, and finally to the final recession. Each stage of enterprise development will have its own specific and development problems. This growth stage and process is called the enterprise life cycle. The concept of the enterprise life cycle was first proposed by Mason Haire in 1959. In 1989, American management scientist Adizes fully expounded the theory of enterprise life cycle. He believes that with the continuous evolution of the life cycle, organizations will face various problems when enter-

ing a new stage. If companies cannot solve problems and overcome difficulties through effective decision-making, blindly repeating the old road will hinder the organization's ability to develop. The description and analysis of the enterprise life cycle theory are the behavior patterns that are usually chosen during the development of the company, and the best behavior that the company should choose to avoid typical problems that may be encountered during growth and aging. However, the derivation of a company's life stage is different from that of the natural organism. It is not a one-way change. Through a series of activities such as R & D and innovation, an enterprise may change from one lifecycle stage to another, thus exhibiting reversibility [1]. Domestic and foreign scholars have carried out a lot of theoretical analysis and empirical research on the relevant influencing factors of the enterprise life cycle, and the economic consequences of the company's life cycle to the company's operations, investment, and financing activities, and achieved a series of research results. However, the research on the measurement model and the method of division of the enterprise life cycle has not come to a consistent result. How to correctly and scientifically divide the life cycle of the enterprise is still a problem of great controversy. This article gives a detailed review of the division of the life cycle of companies and their measurement methods, and identifies their strengths and weaknesses, and then provides guidance for interdisciplinary research on financial accounting, management accounting, and capital markets from the perspective of the company's life cycle theory.

The article is organized as follows. The first part introduces the theory of enterprise life cycle in detail. The second part categorizes and summarizes the division method of enterprise life cycle at home and abroad. The third part, based on the second part, analyzes the advantages and disadvantages of the division method of the enterprise life cycle in part, and then draws the author's view on the most reasonable method of dividing the life cycle of the enterprise at this stage.

2. Business Life Cycle Theory

There is a life cycle in the development of everything in the world, and companies are no exception. The life cycle of an enterprise is like a pair of invisible giants, and it always influences the trajectory of enterprise development. The so-called "enterprise life cycle" refers to the fact that an enterprise has the same life cycle as human beings and other organisms. It generally experiences different stages such as entrepreneurship, growth, maturity, and recession. Enterprises at different stages will have different characteristics and experience external and internal different risks [2].

Greiner (1972) based on the number of employees and sales revenue, put forward a five-stage model based on their different performance in terms of organizational size and age, namely, the founding phase, guiding phase, decentralization phase, coordination phase, and cooperation phase. Robert E. Quinn and

Kim Cameron (1983) simplified the enterprise life cycle into four phases based on Greiner. Richard L. Daft (1999), based on Greiner, Quinn, and Cameron, put forward a four-stage model of the enterprise life cycle, namely, the entrepreneurial stage, the collectivization stage, the standardization stage, and the refinement stage. The discussion of life cycles with Greiner, Quinn, and Daft only rests on differences in the organizational structure. Another American scholar, Adizes (1989), discusses the fundamental elements of the company's life cycle and divides the life cycle of the company into gestation. Stage, growth stage, and aging stage, and they are divided into 10 stages in detail. The Chinese scholar Chen Jiaze (1995) has re-divided the life cycle of the company. He divides the life cycle of the company into: the gestation period, the survival period, the high-speed development period, the maturity period, the recession period and the metamorphosis period. At present, the standard life cycle analysis considers that the life cycle of an enterprise should be divided into several stages: start-up, growth, maturity and decline [3].

2.1. Entrepreneurship

In the initial period, the development of the company depends on the recognition of the market for its products or services. The company is still in the stage of exploration and the operating risk is extremely high. At this stage, the company does not need to carry out mergers and acquisitions, nor does it have the conditions for implementing mergers and acquisitions.

2.2. Growth

Growth period is the stage of high-speed development of the company. The company's products or services have just gained market recognition. Companies need to expand their production capacity to seize the market, so as to gain more profits and accumulate the original capital. Combined with M & A practices, M & A at this stage involves a number of industry-related mergers and acquisitions, especially horizontal M & As. However, at this stage, companies lack management experience and face short-term expansion of scale. There may be relatively large risk of merger and acquisition failures. Even if they succeed, in formulating mergers and acquisition strategies, they mainly focus on addressing current expansion needs and do not fully consider the long-term development of the company.

2.3. Maturity

The mature period is the most robust stage for a company's development. The company at this stage has rich management experience, reserves a large number of professional talents, can conduct industry-related mergers and acquisitions, strengthen its market position, and can also conduct diversified M & A investment. Moreover, the probability of successful mergers and acquisitions at this stage is the highest. First, the mature stage companies have stable operating cash

flow and certain self-accumulation of capital, and the market status is confirmed by external financing institutions, which in turn makes it easier to obtain support from external financing. Secondly, rich management experience and market experience can better integrate after mergers and acquisitions. Finally, mergers and acquisitions during the mature period are also an inevitable choice. Enterprises hope to become bigger and stronger, but relying on their own development is very slow. With reference to the development experience of advanced companies in the Western countries, the acquisition of M & A at a certain stage of development is an important means to break through the bottleneck of development.

2.4. Recession

During the recession, the company's products have been eliminated from the market, and various alternatives have forced companies into bankruptcy. At this stage, companies can inject high-quality assets through mergers and acquisitions into promising industrial sectors. However, the enterprises in the recession period may not fully understand the operating problems existing in the new industry field, and they are unable to achieve successful mergers and acquisitions because of their traditional concepts. In addition, during the recession period, the company's operating cash flow is not sufficient and its financing capacity is limited. If there are unexpected problems in the operation of the target company, its response capacity is extremely limited. In other words, the capital issue will further reduce the decline of enterprises in the recession period to save themselves through mergers and acquisitions.

3. Life Cycle Division and Measurement Methods

There are two methods, quantitative and qualitative, that divide the life cycle of a company. The qualitative approach is to match the characteristics of the company at the current stage with the characteristics of the authority to divide the life cycle of the company. The most representative representation is the article which Adizes (1989) proposes the method of division of the enterprise life cycle. However, the theoretical community currently focuses on the use of quantitative methods to divide the life cycle of the company. The main methods of division are univariate, comprehensive index, and cash flow combination methods [2].

3.1. Univariate Method

DeAngelo (2006) found that the higher the company's value of retained earnings/net assets (retained earnings/total assets) is, the more likely it is to pay dividends, and then proposes to use univariate retained earnings/net assets (RE/TE) or retained earnings/Total assets (RE/TA) to divide the company's life cycle. The low RE/TE (RE/TA) companies are in the capital injection phase, while the high RE/TE (RE/TA) companies tend to be more mature and have more funds to distribute dividends. In the company's mature period [4], Song Futie and Qu

Wenzhou (2010) believe that the value of retained earnings/total assets is vulnerable to the influence of capital structure. The higher the company's asset-liability ratio in the same life cycle, the smaller the value of retained earnings/total assets, so the index is not as good as retained earnings/net reliable assets [5]. Luo Qi and Li Hui (2015) refer to the approach of Denis and Osobov (2008) to select retained earnings/net assets (RE/TE) for the division of the company's life cycle [6] [7]. By comparing the company's characteristics of the ratio in each range, the A company with a TE of less than 0.1 is defined as a growth company, and a company with an RE/TE greater than or equal to 0.1 and less than 0.5 is defined as a mature company. Zhao Puhe and Sun Aiying (2005) and Tang Yang *et al.* (2014) used the growth rate classification method in industrial economics to divide the life cycle of enterprises. The core of the division is to compare the growth rate of enterprises in two adjacent periods and their corresponding industries in the corresponding period. It is pointed out that the growth period mainly means that the growth rate in the two adjacent periods is greater than the average growth rate of the corresponding industry, or that the growth rate in the previous stage is close to the industry growth rate, and the growth rate in the latter extreme is greater than the growth rate in the industry; the mature period refers to the previous one. The stage growth rate is greater than the industry growth rate, while the growth rate in the latter stage is smaller than the industry growth rate; the recession period means that the growth rate of the adjacent two periods is lower than the industry average growth rate of the corresponding period [8] [9]. Li Ye (2000), Yao Yilong, etc. (2009), Wang Fengrong, etc. (2012) and Yang Yan, etc. (2014) selected the listed company's sales revenue trends over the years to judge the company's life cycle, and the company's curve was in a clear upward trend. It is classified as a growth period; companies that have a significant downward trend in the curve are assigned to a recession period; companies that do not change their curve or have a flat trend are classified as mature [10] [11] [12]. Tong Yan and Chen Sasha (2010) use the company's overall cash flow status for three years to divide the life cycle of the company, subtract the sum of net cash flows from three-year investment activities, and cash from three-year financing activities. Companies with a positive net flow sum are considered to be going out of business; those with a positive sum of net cash generated from three-year investment activities and negative net cash flow from three-year financing activities are considered mature business [13].

3.2. Comprehensive Index Method

For the first time, Anthony and Remesh (1992) used the variable scoring method of sales revenue growth, dividend payment, capital expenditure, and age of the company to divide the life cycle of the company. Because there are many investment opportunities in the growth stage, the company has a higher capital expenditure rate in the growth period and a higher growth rate in sales revenue. With the development of enterprises, retained earnings gradually show a growth

trend. In the growth period, a large amount of surplus funds are put into the development of enterprises, so that retained earnings are relatively low during this period, and retained earnings accompany the company's continuous development and development. Mature, the growth of the company began to decline, but the continued increase in retained earnings. However, after the company enters a recession period, retained earnings may be used for new investment by the enterprise, allowing the company to grow for the second time, but it may not be used for new investment and accumulate more retained earnings [14]. After Anthony and Remesh, Wayne (2002) used a variable such as capital expenditure, sales growth rate, city-to-book ratio, and R & D expenditure to comprehensively divide the company's life cycle stage [15]. Zhang Junrui, Zhang Jianguang, and Wang Lina (2009) divided the company's life cycle by calculating two indicators: standardized sales growth rate and standardized capital expenditure growth, and then studied the relationship between corporate life cycle and cash holding. Among them, standardized sales growth rate = (average sales growth rate in the past three years − average value of sales growth rate of enterprises in the industry in the last three years)/standard deviation of the sales growth rate of enterprises in the industry in the past three years; annual standardized capital expenditure growth = (enterprise Capital expenditure growth − industry average capital expenditure growth/standard deviation of industry capital expenditure growth [16]. Li Yunhe and Li Zhan (2012) combined the advantages of scoring method and industrial economics method, and used the four indexes of main business growth rate, retained earnings rate, capital expenditure rate, and company age to establish new division indicators of the company's life cycle. The dynamic aspect of enterprise development studies the relationship between managerial agent behavior and company overinvestment as the company's lifecycle evolves [17].

3.3. Cash Flow Combination Method

Dickinson (2011) uses cash flow to record the economic characteristics and market behaviors of each life cycle stage of the company, and combines the cash flow portfolio method with the method of Livnat *et al.* (1990) and Black (1998), which refers to the company's operating activities and investment activities. The symbol of the net cash flow of financing activities and the life cycle of the company are divided into eight phases [18] [19] [20].

	1	2	3	4	5	6	7	8
	Introduction	Growth	Mature	Shake-Out	Shake-Out	Shake-Out	Decline	Decline
Predicted sign								
Cash flows operating activities	−	+	+	−	+	+	−	−
Cash flows investing activities	−	−	−	−	+	+	+	+
Cash flows financing activities	+	+	−	−	+	−	+	−
The source is Dickinson (2011) article "Cash Flow Patterns as a Proxy for Firm Life Cycle"								

The proposal of the cash flow combination method was widely favored by scholars. Huang Hongbin *et al.* (2016) used the improved cash flow combination method to divide the company's life cycle, and then studied the relationship among the enterprise life cycle, financing constraints and financing methods from the perspective of investor sentiment adjustment effect [21]. Zhou Xiaosu *et al.* (2016) used cash flow portfolio method to classify sample companies into three life cycle stages: growth period, maturity period, and recession period. Then they studied the relationship among the financing needs, and the life cycle and earnings management of A-share listed companies in non-financial industries [1]. Zhou Xiaosu *et al.* (2015) used the cash flow portfolio method to classify the company's life cycle, Based on the data of Shanghai and Shenzhen A-share listed companies from 2010 to 2013. The empirical test examined the effect of firm accounting stability on the capital investment efficiency in different life cycles [22]. Cao Yu *et al.* (2010) draw on the cash flow portfolio method to classify the company's life cycle. From the perspective of the company's life cycle, they examine the influence of different types of ultimate controllers' control rights, cash flow rights, and the degree of separation of two rights on the company's value [23]. Xie Peihong and Wang Chunxia (2017) used the cash flow portfolio method to divide the company's life cycle, and studied from a dynamic perspective the influence of the management power of China's manufacturing listed companies on investment efficiency [24].

3.4. Others

Cao Yu *et al.* (2009) use questionnaires to determine the life cycle of companies. There are two specific methods. One is to set options in the questionnaire so that respondents can judge the life cycle of the company. The other is to set four questions about the growth rate of main business income, company age, organizational structure, and product structure in the questionnaire, and adopt a fuzzy comprehensive judgment method based on the respondents' questions and the characteristics of the company's different life cycles to distinguish the stage of life cycle [25].

4. Comment on the Measurement Method of Enterprise Life Cycle

Due to the advent of the era of big data, empirical research has become the current method of financial research in parallel with normative research. Empirical research is a research method that obtains objective materials, from the individual to the general, and summarizes the essential attributes and development laws of the objects through a large number of observations, experiments, and investigations. It emphasizes the role of mathematics in modeling and data analysis based on empirical data, and quantitatively reveals the regularity of various economic phenomena. Therefore, whether or not the quantitative division of the company's life cycle can be used as a key perspective of the empirical study of

accounting can be used as a dynamic perspective. At present, domestic and foreign scholars have carried out a lot of theoretical analysis and empirical research on the relevant influencing factors, measurement models, and division methods of the company's life cycle, and have obtained a series of research results. But the methods are varied and have not yet reached a consistent conclusion [1].

It can be seen from the above that the univariate method mainly divides the company's life cycle into simple and clear through financial indicators such as retained earnings/net assets, retained earnings/total assets, sales revenue, and industrial growth rate. However, the author believes that the company's life cycle is different, and its company size, growth, financing constraints, financing channels, growth, investment opportunities, competitive environment, and operational and financial risks are all significantly different. Therefore, there are obviously big flaws in dividing the life cycle of a company, using one financial indicator. The use of different financial indicators may lead to large inconsistencies in the research results, which will greatly reduce the credibility of the empirical research results.

The comprehensive index method is mainly to select multiple financial indicators to use an integrated scoring method to divide the life cycle of the company. The author believes that although this method avoids some defects of the univariate method to a certain extent, it still has certain arbitrariness. Taking the division method of Anthony and Ramesh (1992) as an example, the division method needs to assume that there is a linear relationship between the company's operating activities: cash flow, sales revenue, and the market life cycle, and the company's life cycle factors, but this hypothesis actually has no corresponding economic theory support [22]. Dickinson (2011) believes that Anthony and Ramesh (1992) have misunderstood the method of dividing the life cycle of enterprises. According to relevant economic theories, there should be a nonlinear relationship among the cash flow, operating income, market life, and the factors of life cycle [18].

The cash flow portfolio method uses the positive and negative signs of the net cash flow of business operations, investment, and financing activities to divide the company's life cycle. They can reflect the growth rate, profitability, and operational risks of different companies and can reflect the relationship among operational capabilities, resource allocation, and strategic choices.

During the period when the business was established, the operating activities did not yet form a positive net cash inflow, the net cash flow from operating activities was negative, and the investment expenditure was often large. Therefore, the net cash flow from investment activities was negative, and the lack of funds often required a large amount of external financing, so the net cash flow from financing activities is positive. With the development of enterprises, business operations in the growth stage are gradually on the right track. The main strategy is to expand sales and occupy the market. The increase in sales revenue and profits motivates enterprises to form a positive net cash flow from operating ac-

tivities. It is also constantly expanding its scale. Investment has been pointed out that internal funds are often unable to meet the needs of enterprises' development and external financing needs will increase. Therefore, the symbols of net cash flow from business operations, investment, and financing activities in growth periods are positive, negative, and positive respectively. Enterprises entering the mature stage have already gained a relatively large market share, and their operations tend to be stable. They have stable customers and suppliers, and at the same time, they have more financing channels, but investment opportunities have fallen for a long time. Based on the free cash flow control hypothesis, there are still a large number of capital investment expenditures during the mature period, and the company also has acts such as repayment of debts and repurchasing of stocks, thus making the net cash flow symbols of the company's operations, investment and financing activities as Positive, Negative, Negative. Due to the fact that other situations are supported by anti-independence economic theories, the other five cases are often classified as recession and turmoil [1] [18] [21].

It can be seen that the cash flow portfolio method can better overcome the deficiencies of the univariate method that only divides the enterprise life cycle from a single level and does not need the assumption that each factor has a linear relationship with the life cycle as the integrated index method. Therefore, the author thinks that the use of the cash flow portfolio method is more rational and scientific.

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