

BCG Matrix's Problems and Its Reconstruction

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Abstract: Boston Consulting Group (BCG) Matrix is a common approach to managing a portfolio of different strategic business units (SBUs) or major product lines. Since the early 1970's the BCG developed this matrix, over 30 years has been passed. And due to the rapid nature of change and increasing complexity of today's competitive environment, the matrix needs improving in many aspects, like the incompleteness of vertical axis and something wrong with the formula and calculation of horizontal axis, which is often ignored and misleads the decision-making. Therefore several concrete improvements have been discussed here.

Keywords: sales growth rate, relative market share rate, scale economy, product life cycle

1. Introduction

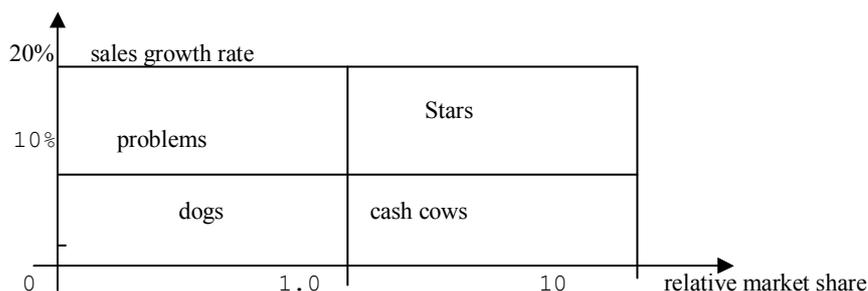
Boston Consulting Group (BCG) Matrix is a common approach to managing a portfolio of different strategic business units (SBUs) or major product lines. The BCG Growth-Share Matrix positions the various SBUs/product lines on the basis of Market Growth Rate and Market Share relative to the most important competitor. It provides a framework to compare many SBUs/product lines and for allocating resources between the different SBUs or product lines, which is divided into four categories (As shown in diagram 1).

SBUs/product lines with a relative high market share in a high growth market share are designated as Stars.

SBUs/Product lines with a relative high market share in a low growth market are designated as Cash Cows.

SBUs/Product lines with a relative low market share in a high growth market share are designated as Question Marks or Problem Children.

Diagram 1, BCG Matrix



A different strategic investment approach is taken for each of the four different categories. By making the assessment of SBUs' advantages and disadvantages, the BCG matrix offers the portfolio of investment.

Cash Cows typically have large market shares in mature, slow growing markets. Cash cows require little investment and generate cash that can be used to invest in other SBUs/Product lines, like Stars. Stars are

SBU/product lines that have a large market share in a fast growing market. Stars frequently require ongoing investment to maintain their market leadership because of the rapid growing market. As more marginal competitors withdraw the market and the market matures and slows down. Successful stars become cash cows and generate significant cash. Question Marks operate in high growth markets, but suffer from low market share. The strategic options involve investing resources to grow market share or withdrawing. Investing to grow market does not guarantee these SBUs or product lines will become stars and they maybe turn to be dogs. So it is termed Question Mark. A dog suffers from having low market share in a mature and slow growing market. Investment will usually have little benefit and withdrawal is usually the best strategy for those SBUs classified as Dogs.

This strategic approach is mainly based on the theory of product life cycle, which is taken for granted that products usually start with those of Question Marks. And if it can run successfully, it will become Stars, then Cash Cows, and finally Dogs that will withdraw the market.

Generally speaking, BCG matrix has obvious merits, in which firms can combine their products rationally, harvesting or reducing their products, etc and investing on more prospective products in their limited resources.

However, many scholars and institutes show doubts about the matrix, indicating its limitation. A.T. Kearney comments on its hypothesis limitation: its analysis depends on its inner financing, without considering outer financing. Debt financing is beyond the matrix. On the other hand, the units in firms are independent, in contrast, the units are closely linked in reality. Suppose cow unit and skim dog unit are interactive, the dog unit is abandoned, which affects the cow unit inevitably.

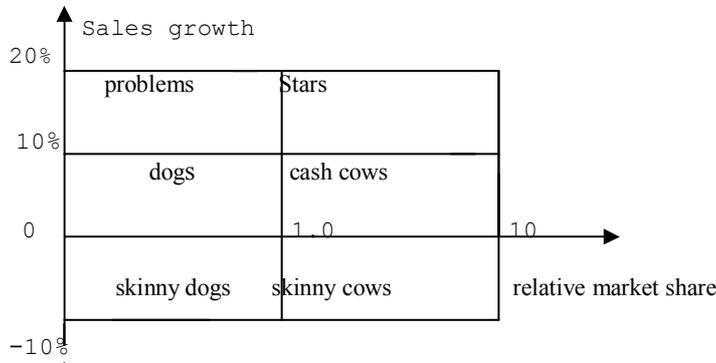
With regard to market share rate, Michael Porter thinks scale is not prerequisite of competitive advantages, instead, differentiation makes it. The BCG matrix's hypothesis is cost advantage, which is adaptive to the firms taking the policy of cost advantage. Scale economy can reduce cost in some degree in the mature market, while in the market of China, the innovation of logistics and marketing can reduce more cost of production.

However, the main debate focuses on the tactics of the Matrix, without identifying the fault of the basic frame, or put it another way, in author's opinion there is even something wrong with its axes of the sale growth rate and the relative market share.

2. The Incompleteness of Vertical Axis-the Sales Growth Rate

In the BCG matrix, 10% is the borderline between high points and low points but it ignores the possibility of negative growth, which is a common phenomenon in the buyer market with the declining macroeconomy and evil competitors. So only the vertical axis extend downward showing the negative value can the variety of the strategic SBUs be shown exactly. So two kinds of category – “skinny cow” and “skinny dog” should be added to the matrix (See the diagram 2). Skinny cow is a negative showing no increasing sales of this year. In this case enterprises must find out the reasons for it and take some corresponding measures. Skinny cow can't fall too much and its bottom line is 10%. Otherwise, it will make a bad effect on the relative market share and turn to be skinny dog. On the contrary, it is also a provider of cash and can provide considerable profit, unless it brings about the negative effect to enterprises. But enterprises must put effort to maintaining its market position. While skinny dog lies in the stage of decline and in the low market position having little profit or negative profit. Without the breakthrough of technology, it is hard to change its situation. So it's better to withdraw the market

Diagram 2, New BCG Matrix



3. The Static State of the Vertical Coordinate Axis in BCG Matrix

The vertical axis of BCG matrix is sale growth rate, reflecting only the sale speed of growth or reducing of firms themselves, without revealing the dynamic relationship between firm SBU's sale growth and the average growth of the entire industry. For instance, the sale growth of SBU is 15%, which is higher growth rate in accordance with the Matrix, but the average rate of industry is 20%, which means SBU's growth is lower than the industry average growth. In reality, this so-called low growth SBU in higher growth industry lies in the disadvantageous and positive situation. So only the index of industry sale growth rate is considered can firms' SBU dynamic development and its competitive position be precisely revealed. The specific measures are in the diagram below: the blue dot stands for SBU's sale growth rate higher than the industry average growth rate, meaning firms must strengthen their competitive state; the red dot shows SBU's growth lower than the industry, of which firms must be aware; the yellow signifies the synchronization of SBU's growth with the industry.

4. The Mathematic Flaws in Calculation Formula of Horizontal Axis-the Relative Market Share

In the BCG matrix, the relative market shares are those relative to the biggest competitors of the same industry and the competitors should be the benchmark on which all the enterprises compare their relative market shares and it should be a fixed value in a coordinate system. In this way can the relative market shares be comparable. But it is where the problem just lies. According to the matrix, the biggest competitor is not a fixed value and in the majority it is the leader of the same industry. But when the leader apply this approach, the biggest competitor becomes the second enterprise instead of a leader. In the same system, the change of criterion leads to the loss of objective assessment of the relative market shares. In accordance with the approach, only the industry leaders can be classified as gold cash and stars and all the other enterprises ranking the second or behind is a question mark or a dog, which is opposite to the realities of challengers and followers of industry. In fact, with high market share and much profit, they should be designated as cows and stars. While depending on the BCG approach, they are wrongly classified as questions and dogs. So we can see the conflict between the theory and the reality is obviously created by the basic assumptions of calculation in the BCG approach.

In summary, the flaws are as follows: the biggest rivals are regarded as the criteria and such criteria are not fixed values. And for the applicability and rationality of the portfolio approach in general, suggestions are given as follows to consider:

4.1 The criteria should be the arithmetic average of market share

Suppose there are 100 enterprises and the average market share is 1/100, namely 1%, the relative market share = market share of enterprises / the average market share. If the relative market share is over 1, the enterprises have high market share and vice versa. The method is simplistic, ignoring the enormous difference in the scale of enterprises. The average market share is respectively 2% and 40%, both of which show high market share and can be classified as stars and cows. But they differ by 20 times. So such calculation is lack of exactness and persuasion. And it is only applicable to large numbers of small or medium enterprises among which the largest market share is less than 10%. With the low intensity of industry and little differentiation of products, the enterprises are in the situation of intense competition.

4.2 The criteria should be weighted average of market share

This approach is applicable to the enterprises with various scales. Suppose there are 100 enterprises in an industry. We can divide them into three types: the large, the medium and the small. There are 10 enterprises with the weighted value of 0.6, 20 middle enterprises with the weighted value of 0.3 and 70 enterprises, whose weighted value is 0.1. Then the relative market share is

$$10 \times 0.6 + 20 \times 0.3 + 70 \times 0.1 = 19$$

$$1/19 = 5.3\%$$

If the market share of enterprises are over 5.3%, the enterprises have high market share. And vice versa. And the weighted value is established mainly by the scale of enterprises and the extent of its impact on the development of enterprises.

Comparably, by the means of the relative market share, the approach can exactly reflect the position of enterprises. But there are also some problems: the way of choosing the criteria and the establishing of weighted value. How to solve the problems largely depends on the decision-makers. Different makers lead to different results. Therefore there exists strong subjectivity in the process of choice and it's hard to be uniform.

4.3 The requirements of scale economy should be taken into consideration in establishing the criteria of relative market share

According to the general principles of economics, every industry has its own lowest economic scale. Only the enterprises satisfy the demand of the lowest economic scale in the aspect of production scale and the relative market share, can they have the average profit of the industry. And those enterprises whose level of profit surpasses the average profit can be regarded competitive. In general, the higher of the market intensity, the higher of economic scale. It is estimated that in the car industry, the lowest economic scale is 100 million cars per year. If the enterprises exceed it, it will have high market share and vice versa.

The approach is the reference to the level of profit. The enterprises with high relative market share don't necessarily have high level of profit. Last year, the annual output of both Toyota and GM is 1000 million cars. Toyota gains a hundred million dollars, while GM loses several billions. However, the relative market share and the level of profit change in the same direction in most cases.

4.4 The characteristics of industry should be taken into consideration in establishing the criteria of the relative market share

Different industry has different market intensity and their criteria of establishing market share is different. In accordance with the market classification of economics, there are oligopoly market, monopolistic competition market and perfect competition market. In the oligopoly market, large shares of market are mainly taken by only several big enterprises, so the market share is higher. And it is usually 10% by experience estimating. Those who surpass it have high market share and vice versa. While in monopolistic competition market, there are numbers of enterprises with various products and brands in the situation of intense competition. So the market share is lower, which is estimated to be 5%. In the perfect competition market, the competition is much intense because of little differentiation of

products and brand and the market share is 1%.

The approach depends on the structure of market and the experience of decision-makers. It's convenient to operate, but it is hard to make a uniform criteria because of its strong subjectivity.

4.5 The development stages of industry should be taken into consideration in establishing the criteria of relative market share

Many industries, like automobile industry are close to be perfect competition markets in their initial stage of development with large numbers of small and medium enterprises(SMEs)and the index of measuring tends to be lower; the enterprises become the monopoly market in the middle stage, in which many enterprises without advantages withdraw the market because of the intense competition and the intensity is higher with large numbers of enterprises reduced to be several ones of large scale and the differentiation of products and brands is high; in the mature stage, with higher intensity and larger scale of enterprises and usually the number reduced to be less than 10 in the market, the market turns to be oligopoly market and then the index of measuring the relative market share is the highest with more than two digits. The approach is of subjectivity because of different market environment and the preference of decision-makers.

5. Conclusion

BCG matrix is widely used as the diversification of strategic investing, with profound theoretical significance, but its technical and structural faults in itself remain discovering. The paper reconstructs the matrix, establishing more operational criteria for relative market share rate by setting up a six-quadrant model and a three-colour SBU system for firms to position its SBU precisely and to establish development strategies on more sound objective evidence.

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