Efficiency, effectiveness, and productivity of strategy: a step towards integrating strategic management literature

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Abstract: Even though the terms efficiency and effectiveness are widely used in strategy literature, inaccurate usage of these words is still frequent. We strived to conceptually analyse the two criteria of strategy selection, i.e., compatibility with goals and with circumstances to obtain standard and operational terms for them. Subsequently, we created a bond between the two criteria of strategy selection and the concepts of effectiveness and efficiency, and thus ultimately defined 'strategy effectiveness' and 'strategy efficiency'. The resultant strategy effectiveness and efficiency were introduced as the index of productivity, which signifies the ultimate utility of a strategy.

Keywords: strategy selection; effectiveness; efficiency; productivity; compatibility.

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1 Introduction

The concept of strategy selection was put in the spotlight following the emergence of strategy as an evolving intraorganisational phenomenon (Bower, 1970; Noda and Bower, 1996; Lovas and Ghoshal, 2000; Burgelman, 2002). Organisations are constantly encountering new decision problems, for all of which they must obtain a suitable alternative by examining a set of possible alternatives and going through a decision-making process (Andres and Poler, 2016). Selection of goals and strategy is a type of these decision problems. A part of strategic planning is making a decision on the set of goals (Anthony, 1965) and the other part is making a decision about the strategies. In the second part, strategies are selected from a set of different strategies. This strategy selection is among the most important duties that managers have to fulfil in a complex

market (Eppler and Platts, 2009) as it can integrate the organisation's diverse prospects and coordinate different functional areas of the organisation (Ansoff and McDonnell, 1988; Lorange and Vancil, 1976).

The selected strategy will have numerous influential outcomes in all parts of the organisation. Therefore, some (Burgelman, 1983) do not limit its selection to a planning and analysis process, but regard it as an expansive organisational phenomenon. In spite of this, what actually happens is that strategy selection is done through a sequence of analytical-rational steps which encompass the mission, competitive analysis, internal analysis, etc. (Andrews, 1971; Cohen and Cyert, 1973; Schendel and Hofer, 1979). Consequently, strategic planning is defined as the systematic process of determining the firm's goals and objectives for at least three years ahead and developing strategies for the acquisition and use of resources to achieve these objectives (Kudla, 1978).

Chandler (1990), Bowman and Hurry (1993), Mintzberg (2003), Kvint (2010), Rumelt (2011) and many other scholars have similar definitions for organisational strategic planning. Among all these definitions, what is emphasised by the authors is that the strategy should be considered the result of an official planning process which is the responsibility of senior managers (Brews and Hunt, 1999; Grant, 2003). During this process, goals and strategies should be determined, and minor issues should be resolved.

This formal planning process is divided into two major phases: strategy formulation and strategy implementation (Farjoun, 2002). Formulation phase comprises of four steps based on the SWOT approach (Hill and Jones, 2012; Bryson, 1988):

1 goals selection

2 external opportunities and threats analysis

3 internal strengths and weaknesses analysis

4 strategy selection.

In the first step, the corporate mission and major corporate goals are determined. In the second step, the organisation's external competitive environment is analysed to identify opportunities and threats. In the third step, the organisation's internal operating environment is analysed to identify the organisation's strengths and weaknesses. In the fourth step, those strategies are selected that build on the organisation's strengths and correct its weaknesses in order to take advantage of external opportunities and counter external threats. These strategies should be consistent with the mission and major goals of the organisation. They should be congruent and constitute a viable business model (Marileide et al. 2020). In the fourth step and before selecting a strategy, it is necessary that the strategy alternatives be expanded, as some scholars believe that within strategy formulation, the most critical step is the generation of strategy alternatives (Gallagher et al., 2015).

Figure 1 shows these steps as stated by Hill and Jones (2012). As is evident, strategy has a lower position relative to goals in the strategic structure of the organisation. This means that strategies only exist to enable us to achieve the goals, and strategy selection should be done with a close attention to the goals. For the same reason, once a strategy has been implemented, its execution must be monitored to determine the extent to which strategic goals and objectives are actually being achieved (Hill et al., 2014).

Figure 1 Generation of strategy alternatives (see online version for colours)

On the other hand, there is not just a single way or a single strategy to achieve a goal; there are many paths that could be taken. The second point in strategy selection is the problem of choosing between different paths that lead to the same destination. Strategists have long tried to find a solution for this problem. In simple terms, it is said that a suitable path is the path that is congruent with the organisation's circumstances (Kourtis et al. 2021). The organisation's circumstances comprise of its competencies and resources on the one hand, and the demands and expectations of the environment it is functioning in, on the other hand. If a path can align and match these two aspects of the organisation's circumstances, then that path to goal achievement is congruent with the organisation's circumstances. Thus, the concept of circumstance analysis in strategic planning is not considered anything different from compatibility with organisation's circumstances (Hill and Jones, 2012). The first dimension of the organisation's circumstances that is related to internal factors is called internal circumstances of the organisation. It is examined in the form of strengths and weaknesses (Bert George, 2019). The other dimension of the organisation's circumstances is called external circumstances, and it is examined in the form of opportunities and threats. The purpose of the analysis done on these four factors, generally known as SWOT analysis (Schendel and Hofer, 1979; Andrews, 1971), is to determine strategies that can exploit opportunities, counter threats, maintain and reinforce strengths, and eradicate the weaknesses (Hill and Jones, 2012). The SWOT analysis is very highly regarded. A research done in 2011 shows that 60% of the studied companies used SWOT for analysis and benchmarking in their strategy selection process (Tapinos et al., 2011).

However, what is commonly seen in some academic researches and in organisations' actual practice is that only one of the two criteria (goals and circumstances) is heeded and the other is ignored. Most often, the criterion that is heeded is the organisation's circumstances and the criterion that is ignored is the organisation's goals. Prusty et al. (2010) believe that "a major research gap in the literature on strategic planning process is also the absence of a method to validate the structural relationship between goals and objectives and between objectives and strategies."

It seems that one of the principal reasons behind this lack of simultaneous attention to these two criteria is the deficiencies in the literature and terminology of strategic management to separate the two aspects when a strategy is being developed. There is a need for specialised indices to be introduced, as a complement to strategic management literature, so that the alignment and congruence of the strategy with the organisation's

circumstances as well as the alignment and congruence of the strategy with goals are measured separately.

What we are looking for in this study:

- drawing attention to the simultaneous compatibility of the strategy with goals and circumstances
- offering definitions and operational terminology for heeding and paying simultaneous attention to both criteria in order to lead management literature towards unity of procedure
- regarding simultaneous attention to both criteria (goals and circumstances), we will try to compute an index that gives us the resultant of the two aspects of compatibility.

1.1 The terms of effectiveness and efficiency in strategic planning literature: the need for more accurate definitions

In management literature, the terms of effectiveness and efficiency are among the most widely used. Regardless of the fact that in the more specialised fields, more specific definitions have been offered and different approaches to calculate them have been proposed, the essential content of these concepts can be considered the same across management literature. Perhaps the most basic definitions for effectiveness and efficiency can be stated in this way: effectiveness is doing the right things and efficiency is doing things right. Despite the fact that effectiveness and efficiency are easily distinguishable by definition, in practice these words and their adjectives (effective and efficient) are sometimes used instead of each other and their accepted and distinct definitions are ignored (Fuertes et al., 2020). For instance, efficiency of technology has been used when the author meant effectiveness of technology. In some contexts, efficiency is defined as the degree to which the organisation is able to satisfy social demands (Mendelow, 1983). Elsewhere, effectiveness is equivalent to the ratio of produced output to the socially expected output of the organisation (Hofer and Schendel, 1980).

Inaccurate usage of these words is also commonly seen in the literature of strategic management. An author may use the expression of strategy effectiveness while his intention is to talk about efficiency and not effectiveness. For instance, the necessity of developing effective strategies to cope with volatile international environments is mentioned (Lord and Ranft, 2000), while as will be explained later in this paper, efficient strategies are needed to cope with this issue.

In another example (Lovering, 1990), the author has suggested that we select strategies based on organisational effectiveness criteria, while none of the proposed criteria such as risk or ease of implementation imply effectiveness. In another form of inappropriate usage, words are used within the accepted framework, but in a narrow gamut that does not include all of the instances. For example, an effective strategy is known to be one that leads to an increase in profits for shareholders and owners (Hill et al., 2014), whereas an effective strategy might be one that leads to an increase in market share (Amgain et al., 2021).

Sometimes these words are discussed in the right context, but in an ambiguous and general manner. For example, it is said that the formulation of a strategy is effective when various levels of strategic planning are linked to each other in a coherent and

consistent pattern (Bryson, 1988), yet the concepts of levels, links, or coherent links are not specifically discussed.

The main reason behind the incorrect usage of these specialised concepts of strategic management is the lack of an operational definition for these concepts in the literature of strategic management (Lăzăroiu et al., 2020). For instance, when an author deems an understanding of internal and external competitive competencies beneficial for development of effective strategies (Eisenhardt and Martin, 2000), has he consciously used 'effective' because he had a more specific meaning for 'efficient' and thus, not used it in his statement?

In spite of the fact that these concepts have accepted and distinct definitions in management literature, there is a need for operational definitions to be introduced on the basis of fundamental concepts in the more specialised field of strategic management. When the process of strategic planning is defined as a process to obtain strategic answers that are effective and efficient (Desouza and Evaristo, 2003), we must be able to define effectiveness and efficiency in an operational manner. Existence of operational definitions will help the efforts to quantify these concepts to be developed more quickly and more accurately.

1.2 Moving towards an operational definition for efficiency, effectiveness and productivity of a strategy

In this part we will first discuss the distinction between the concepts of effectiveness, efficiency and productivity in the general management context, and then we will discuss these concepts in the strategic management context and finally, we will provide an operational definition for them.

In Figure 2, X shows current location and A, B and C show possible destinations. There is one or more paths to arrive at each point that is chosen as a desirable destination. When choosing a path to move from X to the desirable destination, two essential ideas must be considered:

1 The path that leads to the desirable path must be selected. If the desirable destination is A, then we must put the paths III and IV aside and focus on I and II.

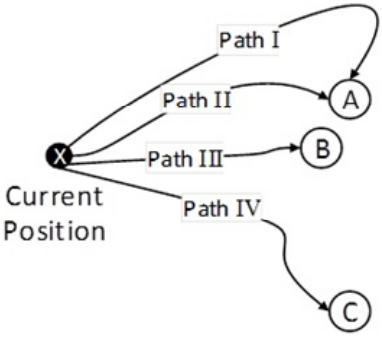
2 The path with a shorter length, less cost, or higher safety should be chosen. Among the paths I and II, path II has a shorter length and is worthy of selection.

The first point signifies the concept of effectiveness in path selection, and the second point signifies the concept of efficiency in path selection. Path effectiveness means a path is effective if it delivers us to the desirable destination. In binary terms, effectiveness of paths I and II is equal to one and effectiveness of paths III and IV is equal to zero. Nonetheless, we can remove the binary form and say that the effectiveness of path III is definitely higher than path IV, because it leads us to a destination that is closer to the desirable destination.

Path efficiency means that a path is more efficient if it has less cost, shorter length, or higher safety. In fact, length and cost are representatives of resource wastage and safety is representative of success probability in the definition of efficiency. Path I is longer compared to path II, so we must consider it less efficient.

Path productivity can be considered the resultant of path effectiveness and path efficiency. Path II is considered the most productive path, because it leads to the destination and does so with a shorter distance.

Figure 2 Paths may lead to different destinations (effectiveness)



In the literature of strategic planning, goals are destinations and strategies are paths. Therefore, we can transfer the definitions offered in the process of path selection to the process of strategy selection and in this way define more specifically the concepts of strategy effectiveness, strategy efficiency and strategy productivity (Figure 3).

1.2.1 Strategy effectiveness

It is an index measured for each strategy that shows to what extent the strategy leads the organisation towards its goals. According to each goal, we can assign an effectiveness score for each strategy that is indicative of that strategy's potential to lead the organisation closer to the goal. Consider two different companies that are manufacturers of clothing and manufacturers of agricultural machinery, both of them having the goal of increasing their market share by 30 percent in the next five years. The strategy of product diversification for this goal does not have an equal effectiveness score in the two companies. It is obvious that we should assign a higher effectiveness score for this strategy in the clothing company.

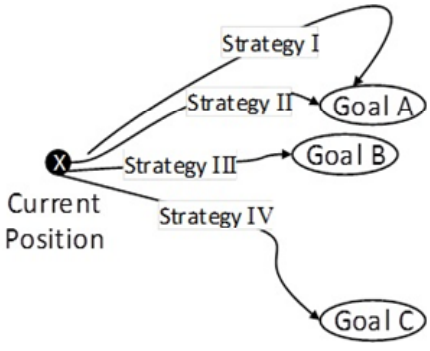
In case several goals have been defined for the organisation, an effectiveness score can be calculated for each strategy according to each goal. A strategy that leads the organisation to a goal that is only near to the intended goal does not receive a perfect effectiveness score; nonetheless, it may receive a relatively good score. In case several goals have been defined for the organisation, effectiveness of each strategy will be equal to the resultant of that strategy's effectiveness according to each goal. In Figure 3, If we consider the organisation's goals to be A and B, strategies I and II are both effective according to these goals. Nevertheless, for goal A in comparison with goal B, both of the two strategies receive higher effectiveness scores.

Strategy effectiveness is a different concept from strategic alignment and should not be mistaken for it. Their main differences are as following:

- Strategic alignment is measured at the time of strategy implementation, but strategy effectiveness is measured at the time of strategy selection.

- Strategic alignment is measured for the internal elements of the organisation, such as processes, technology, culture etc., but strategy effectiveness is measured for the strategy itself.
- In strategic alignment, strategy is the criterion for comparison and evaluation; however, in strategy effectiveness, strategy is the subject of evaluation and the organisation's goals are the criteria for comparison and evaluation.

Figure 3 Strategies help the organisation to achieve certain goals



1.2.2 Strategy efficiency

It is an index measured for each strategy that shows to what extent that strategy is compatible with the organisation's internal and external circumstances. Compatibility with the organisation's internal and external circumstances implicitly includes the two concepts of increasing the probability of success and reducing resource wastage. If the compatibility of a strategy with the organisation's circumstances is increased, wastages will be cut by a certain amount, organisation's potential will be more fulfilled and loss of organisation's resources will decrease. Moreover, the more compatible a strategy is with the organisation's circumstances, the less failure-inducing factors will exist, and the more opportunities for success will appear. Therefore, in Figure 3, the length of path is a reverse symbol for the degree of compatibility, and this means that the shorter the path is, the more compatible the strategy is with the circumstances.

Compatibility of strategy with the organisation's circumstances is not a new subject. For decades, offering a structured pattern for examining the compatibility of strategies with the organisation's circumstances has been the subject of studies, and the SWOT analysis is exactly one of these patterns that examine the compatibility of a strategy with the circumstances.

1.2.3 Strategy productivity

An index is measured for each strategy and shows the ultimate utility of a strategy. The value of a strategy is firstly, in its potential successful implementation, and secondly, whether or not it enables the organisation to move towards its goals in case of its successful implementation. Strategy efficiency implies our prediction of the successful implementation of a strategy, and strategy effectiveness implies our prediction about the achievement of goals in case that strategy is successfully implemented. We must search

for another concept that mixes the two concepts of efficiency and effectiveness and offers a value as the ultimate value of the strategy. This concept is called productivity. Productivity is a concept that is known in literature as the aggregation of effectiveness and efficiency.

A desirable strategy is one that is both effective and efficient i.e. the strategy will lead the organisation towards its goals with low resource wastage and high probability of success. The index of strategy productivity can be used as the sole comprehensive index to compare strategies at all times. If we consider the organisation's goal to be A, Figure 3 shows that strategy IV should be put aside because of low effectiveness and strategy I because of low efficiency. However, regarding the other two strategies, we cannot comment so easily. Strategy II has a higher effectiveness and a lower efficiency in comparison with strategy III. In this situation, the index of strategy productivity which is a combination of the two indices of strategy effectiveness and strategy efficiency, can be decisive.

Figure 4 shows how the concept of strategy productivity is linked to the organisation's circumstances and goals (SWOT). In this figure, the green part shows strategy effectiveness and the blue parts show strategy efficiency. Canales (2015) clarifies that understanding the mechanism of strategy selection is important because it explains how the organisation is already compatible with the selected strategies or how we should make it compatible. The index of strategy productivity is a description of the extent of this compatibility, and its calculation is done as a part of the strategy selection mechanism.

Figure 4 Strategy productivity and how it is related to the organisation's goals and circumstances (see online version for colours)

2 Determining the effectiveness, efficiency and productivity of strategies

2.1 Determining effectiveness of a strategy

In order to determine the effectiveness of a strategy, it is inevitable that we measure the alignment of the organisation's strategy with its long-term goals. However, when we consult these goals, we are not necessarily confronted with a goal or a single level of goals, but a hierarchy of goals. Figure 5 shows the hierarchy of goals and strategy alternatives. This figure is strongly reminiscent of the same structure of goals, criteria, and alternatives that represent the concept of multi-attribute decision making methods like AHP.

Figure 5 Hierarchy of goals and strategy alternatives (see online version for colours)

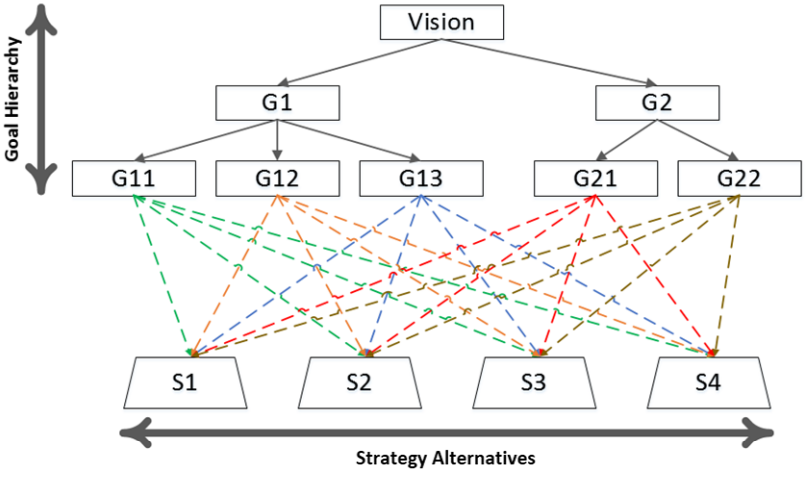


Figure 6 How the effectiveness score of each strategy is determined

	G11	G12	G13	G21	G22	Strategy Effectiveness
Strategy1						
Strategy2						
Strategy3						
Strategy4						

The extent to which the strategy leads the organisation towards a single goal

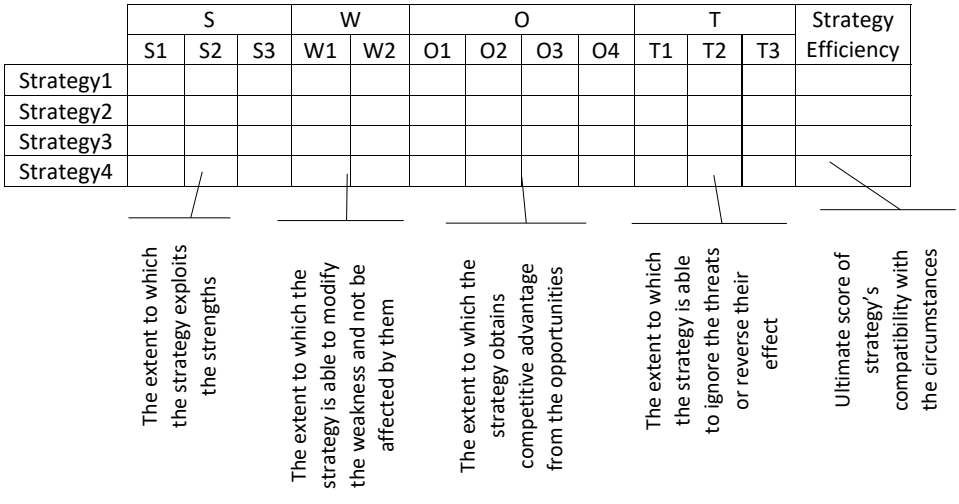
The extent to which the strategy leads the organisation towards a set of goals

Strategy effectiveness is a score that is obtained at the end of a multi-attribute decision making process. In this process, strategies are decision alternatives, and the goals are decision criteria. The ultimate score of each strategy is its effectiveness score because it signifies how much that strategy is in line with the goals. Figure 6 shows that the concept of strategy effectiveness is affected by the strategy's effectiveness relative to each goal.

2.2 Determining the efficiency of a strategy

The efficiency of a strategy is also a score that is obtained at the end of a multi-attribute decision making process. In this process, strategies are decision alternatives, and strategic factors are decision criteria. Strategic factors include strengths, weaknesses, opportunities and threats. The meaning of the score obtained by a strategy when confronted with each of these factors is different. The score that a strategy obtains when confronted with a strength signifies that strategy's ability to exploit the strength. Meanwhile, the score that a strategy obtains when confronted with a weakness signifies that strategy's ability to modify the weakness or not be affected by it. Figure 7 shows that the concept of strategy efficiency is affected by the suitability of the strategy for each strategic factor.

Figure 7 How the efficiency score of each strategy is determined



2.3 Determining the productivity of a strategy

As was said before, productivity of a strategy is the resultant of efficiency and effectiveness of that strategy. Yet the real question is how to measure this resultant. Some strategies with different efficiency and effectiveness scores have been given in Table 1 as examples.

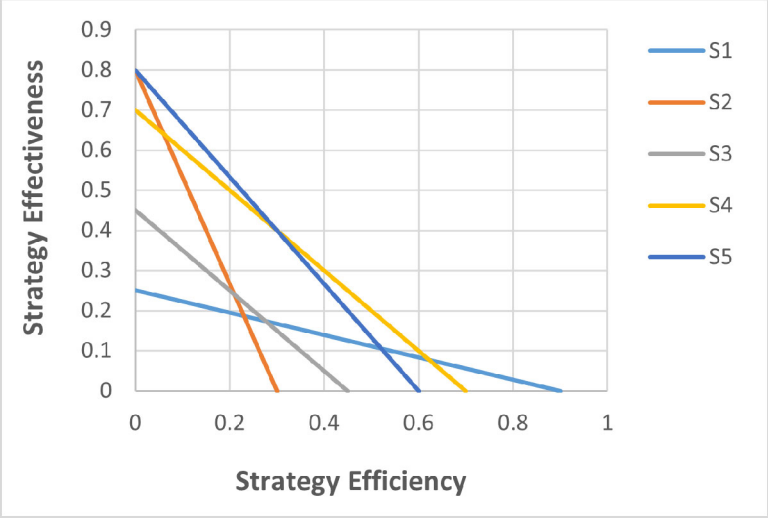
Figure 8 illustrates the efficiency and effectiveness score of some strategies in a two-dimensional coordinate system. Horizontal axis shows the efficiency of the strategy while vertical axis signifies the effectiveness of the strategy. This figure clearly shows that S1 is a strategy that has a high chance of implementation, but lacks the necessary power to lead the organisation towards achieving its goals. S2 is exactly the opposite; although it

has the necessary power to lead the organisation towards achieving its goals, it has a low chance of implementation. S3 strategy has both of these factors moderately. S4 and S5 are strategies that possess both of those factors on a high level.

Table 1 Some strategies with their effectiveness and efficiency scores, provided as an example

Strategy	*EFY*	*EFS*
S1	0.9	0.25
S2	0.3	0.8
S3	0.45	0.45
S4	0.7	0.7
S5	0.6	0.8

Figure 8 Efficiency and effectiveness score of some strategies (see online version for colours)



The fact that S4 and S5 strategies are better strategies than S3 is obvious because they have a higher efficiency as well as a higher effectiveness. In other words, because the productivity lines of these two strategies are higher than the productivity line of S3; therefore, it is clear that they are dominant and have a higher productivity than S3. However, what can be said about the comparison between the productivity of these two strategies and the productivity of S1 and S2? Or about the comparison between the productivity of S4 or S5?

Now we will compare the two strategies of S1 and S4. The efficiency of S1 is superior to S4 by the ratio of 0.9/0.8 = 112.5% but the effectiveness of S4 is superior to S1 by the ratio of 0.7/0.25 = 280%; however, this superiority in efficiency is not enough to compensate for S1 strategy's weak effectiveness. Therefore, we can conclude by the resultant of efficiency and effectiveness that S4 is a superior strategy to S1. Perhaps we can conclude until now, that when facing a pair of non-dominated strategies, we must first determine the ratios of dominance and compare them to identify the dominant strategy (ratio method).

Yet this reasoning is not helpful. Based on this method, S1 is dominant over S3. The superiority rate of S1's efficiency is 200% and the superiority rate of S3's effectiveness is 180%. It is interesting that in a survey done on 18 managers in which they were asked to choose one of these two strategies based on their intuition, eleven of them chose S3, 4 of them chose S1, and 3 of them said they were unable to choose between them. The fact that 61% of managers chose S3 led us to look for a more comprehensive basis to identify the dominant strategy.

The problem of calculating productivity from efficiency and effectiveness can also be considered an equivalent to a multiple attribute decision making (MADM) problem in which strategies are equivalent to decision alternatives, efficiency and effectiveness are equivalent to decision criteria and strategy productivity is equivalent to the ultimate score calculated for each alternative.

We know that many multiple attribute decision making methods have been offered until now and interestingly, multi attribute decision making methods do not necessarily provide a single solution for the same problem. Consequently, we must proceed with caution when choosing an MADM method. Because different methods often create inconsistent rankings for the same problem (Voogd, 1983; Zanakis et al., 1998; Hobbs et al., 1992). In other words, the ranking of alternatives is dependent on the method used. If the alternatives' ranking in different methods vary meaningfully, the validity issue becomes critical (Hobbs et al., 1992). For this problem, we decided to find among some practical MADM methods, a method that is closest to the judgment of the sample of managers (as shown in Table 2).

Table 2 Ranking of MADM methods according to experts' opinions

Strategy	*Majority with a common opinion (number of experts)*	*Ranking of strategy according to majority opinion*
S1	10	5
S2	13	4
S3	9	3
S4	17	1
S5	16	2

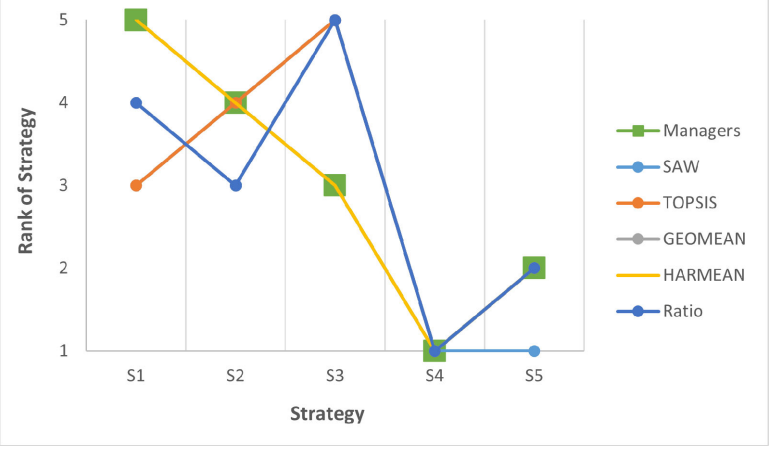
Table 3 Ranking of five strategies according to different methods

	Strategy Score				*Strategy Rank*				
Strategy	*SAW*	*GEOMean*	*HARMEAN*	*TOPSIS*	*SAW*	*GEOMean*	*HARMEAN*	*TOPSIS*	*Ratio*
S1	0.575	0.474	0.391	0.527	3	3	4	5	4
S2	0.55	0.489	0.436	0.472	4	4	3	4	3
S3	0.45	0.45	0.45	0.218	5	5	5	3	5
S4	0.7	0.7	0.7	0.727	1	1	1	1	1
S5	0.7	0.692	0.685	0.672	1	2	2	2	2

We chose SAW, TOPSIS, VIKOR, and ELECTRE methods for the purpose of the survey. In this survey, the weights of the two criteria of efficiency and effectiveness have been deemed equal. As there were only two criteria and their weights were equal, Vikor and ELECTRE methods could not distinguish between strategies like S1 and S4 or S1 and S3, which are non-dominated strategies. In this regard, harmonic and geometric averaging techniques were also considered alongside TOPSIS and SAW methods which are based on arithmetic averaging. Table 3 shows the results of ranking five strategies according to each different method.

Figure 9 clearly illustrates that HARMEAN method has had complete conformity with the managers' opinion and judgment.

Figure 9 Rank of strategies based on different MADM methods and its conformity with the manager's opinions (see online version for colours)



3 Conclusions

The first goal of this study was to emphasise the need for simultaneous attention to both aspects of compatibility at the time of strategy selection. This is a subject that has been rarely discussed. The second goal of this study was to make an effort to distinguish and reinforce these two aspects in the literature of strategic management. For this purpose, we conceptually analysed these two aspects in order to link the two criteria of strategy selection to efficiency and effectiveness. The two terms of efficiency and effectiveness are not usually properly used because they have not been operationally defined. Existence of operational definitions will assist the scholars in their efforts, so that they can quantify these concepts quicker and more accurately.

To achieve the third goal of this study, we made efforts to introduce an index that is the resultant of a strategy's compatibility with the goals and with the circumstances. In other words, the resultant of strategy effectiveness and efficiency was introduced as another index that signifies the ultimate utility of a strategy. We called this index the productivity of a strategy. The concept of productivity lines that was introduced for the ultimate comparison of strategies can potentially open up new horizons in strategic management literature.

Ultimately, in the discussions about strategy, the achievements of this study help us to state with more precision, why and to what extent we believe a strategy is appropriate for the organisation.

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