Towards Sustainable Enterprises in Uncertain Business Environment

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Abstract
Managing resources based on dynamic capabilities for enhancing performance could help enterprises advance towards sustainable growth, solving the challenges offered by the economic crisis and the uncertain markets. The first aim of the paper is to analyze various theoretical approaches related to the links between the real options (ROs) concept and some important strategic management elements. The second aim of the paper is to present the results of research among decision-makers from Romania regarding the management process of enterprises. The results outline that the paper has contributions in terms of theoretical implications because it proposes a mathematical model based on RO. The quantitative research shows that decision-makers implement well-known strategies, they need new instruments to develop their enterprises and they are interested in creating a strong tool based on a real options analysis and strategic management elements. A RO application was carried out on a real organization to prove the practical influence in the decision-making process.

Keywords
Real options; sustainability, smart enterprise; economic environment; uncertain markets.

Introduction

Enterprises must develop their competencies, adjust and look for business improvements. The decision-makers must understand the current strategies and organizations must be flexible in response to opportunities and barriers (Papulova & Papulova, 2006; Brush, Greene, & Hart, 2001). Nowadays, companies activate in a dynamic environment and decision-makers should be prepared for rapid changes. What can decision-makers do first to maintain their companies on market and/or increase their performance? Which are the most appropriate tools that they can use in the decision-making process? They should first concentrate on what they have at that moment. They should anticipate the competitors' reactions, use their capabilities and resources, and focus on strategic leadership and flexibility. This paper is centered on

the RBV (resource-based view) of enterprises, DCs (dynamic capabilities), SF (strategic flexibility), and ROA (real options analysis). According to the concept of the RBV, enterprises gain sustainable competitive advantage by deploying valuable resources (Barney, 1996; Barney, 1986; Dierickx & Cool, 1989; Ray, Barney, & Muhanna, 2004; Wernerfelt, 1984). DCs are essential in obtaining business performance because of their possibility to integrate, develop and recompose resources and capacities as a means of addressing rapid changes in business environments (Teece, Pisano, & Shuen, 1997; Eisenhardt & Martin, 2000; Zollo & Winter, 2002; Makadok, 2001; Zott, 2003). SF describes one of an organization's DCs, which leads to obtaining advantages in uncertain and competitive environments.

Discovering the importance and relevance of managing resources based on DCs for enhancing performance could help enterprises advance towards sustainable growth, solving the challenges offered by uncertain markets. The study relies on analysis and literature review to offer an interesting framework based on elements of management for the decision-making process. The paper has contributions in terms of theoretical implications because it proposes a mathematical model based on RO. In addition, the paper has contributions in terms of practical implications. The impact of RO, DC, and SF on the companies' performance was analyzed using a quantitative research methodology. A RO application was realized on a real company to prove the practical influence in the decision-making phases. The results are useful in practice, especially for enterprises. The paper is following the next structure: after the introduction, section two contains the literature review, section three describes the research methods, methodology, discusses the results, offers a real option application, and section four concludes the paper.

Literature review

Romania's present economic growth model, which is focused on consumer spending, influences the country's capability to achieve the European Union living standards in a sustainable approach (European Commission, 2020) The business environment, development, and investment decisions are being affected by unpredictable policymaking and pandemic crisis. In 2020 health, IT, and communication services, Romanian public administration, and defense were the industries that recorded a positive change in the GDP. In the same year, the decrease in consumer demand causes a loss of revenue in tourism and hospitality, airlines industries, culture, and other services and industries (Statistica, 2020). In addition, enterprises must find various strategies to survive on the market. Some strategic management elements that managers should take into consideration are ROs, their RBV, their DCs, SF, and leadership.

Real options and their analysis

Real options (ROs) refers to the contribution in assets, human resource, and enterprise abilities that offer the chance to react to the events that appeared in the market (Branch, 2003; Kogut & Kulatilaka, 2001). It is an instrument designated especially for managers. A reason for this is that it offers elements that could help the organization to gain a competitive advantage. More accurately, ROA provides a new view on

organizations' resource allocation and a precious prediction on enterprises' decisions for strategic decisions under uncertainty (Reuer, 2002; Reuer & Tong, 2007; German, 2017). The literature on this topic presents some critics regarding ROA (German, 2017). For instance, Mun argues that compared with the classical approaches that provide a statistic deciding ability, RO implies a dynamic series of future decisions. In this situation, the decision-makers must have the flexibility to choose the best opportunities that appeared in the market (Mun, 2002). In some opinions, ROA is only an academic tool. In other opinions, it is a precious instrument that helps managers to choose the riskiest projects because high volatility means a high option value (German, 2017; Nembhard & Aktan, 2010). The volatility variable has the most significant effect on the option value (Miller & Park, 2002; German & Boscoianu, 2015).

RO valuation methods are classified into two categories: analytical and numerical (Schulmerich, 2010). Analytical and numerical methods are discussed in Dixit and Pindyck (1994) and Trigeorgis (1996) The need to use these methods appears when the null-time step limit value of a binomial tree model yields the Black–Scholes formula of the optimal price of an option (Cetinkaya & Thiele, 2014):

$$C(K,T) = S_0 N(d_1) - K e^{-rT} N(d_2) \quad (1)$$

with:

$$d_1 = \frac{1}{\sigma\sqrt{T}}\left[\ln\left(\frac{S}{K}\right) + \left(r + \frac{\sigma^2}{2}T\right)\right] \quad (2)$$

$$d_2 = d_1 - \sigma\sqrt{T} \quad (3)$$

where:
S_0 = current stock price;
K = strike price of an option;
d = multiplicative factor of the stock price;
r = risk-free rate;
T = time to expiration;
σ = underlying asset volatility.

The options to defer, abandon, and switch represent some examples of options that can be analyzed with analytical methods.

The model for the option to defer proposed by McDonald and Siegel (1986) emphasizes the gross value of a project $V(t)_{t\geq 0}$ by a diffusion phase given through the stochastic differential equation (Cetinkaya & Thiele, 2014):

$$dV_t = \alpha V_t d_t + \sigma V_t B_t, t \geq 0, \alpha \epsilon R^+, \sigma \epsilon R^+, \quad (4)$$

where α is the drift on the project and σ is the volatility.

The model for the option to abandon proposed by McDonald and Siegel (1985) introduces the unit output price's diffusion phase $P(t)_{t\geq 0}$ as:

$$dP_t = \alpha P_t d_t + \sigma P_t B_t, t \geq 0, \alpha \epsilon R^+, \sigma \epsilon R^+, \quad (5)$$

The model for the option to switch suggested by Margrabe (1978) is at:

$$e^{-q_1 T} S_{10} N(d_1) - e^{-q_2 T} S_{20} N(d_2) \quad (6)$$

with:

$$d_1 = \left[\log\left(\frac{S_{10}}{S_{20}}\right) + \left(q_2 - q_1 + \frac{1}{2}\sigma^2\right)T\right]/(\sigma\sqrt{T}) \quad (7)$$

$$d_2 = d_1 - \sigma\sqrt{T} \quad (8)$$

$$\sigma = \sqrt{\sigma_1^2 - \sigma_2^2 - 2p\sigma_1\sigma_2} \quad (9)$$

where:
S_{i0} = present stock price of asset *i*, with *i* = 1, 2;
q_i = asset *i* (constant) dividend yields, with *i* = 1, 2;
σ_i = asset *i* (constant) volatility, with *i* = 1, 2;
ρ = (constant) correlation between the assets;
T = time to expiration.

The disadvantage of the analytical methods is that they can value a single real option (Schulmerich, 2010). Trigeorgis (1996) emphasize numerical methods that are used in valuing RO and they contain two categories. One type refers to the estimations of the underlying stochastic process used in correlation with Monte-Carlo simulation to offer sample paths and value the option. Another type refers to the estimations of the partial differential equations based on finite-difference methods (Cetinkaya & Thiele, 2014).

The organization that invests in capabilities using RO expects a return on that investment. Combining elements and models described in the literature, the authors propose a new perspective:

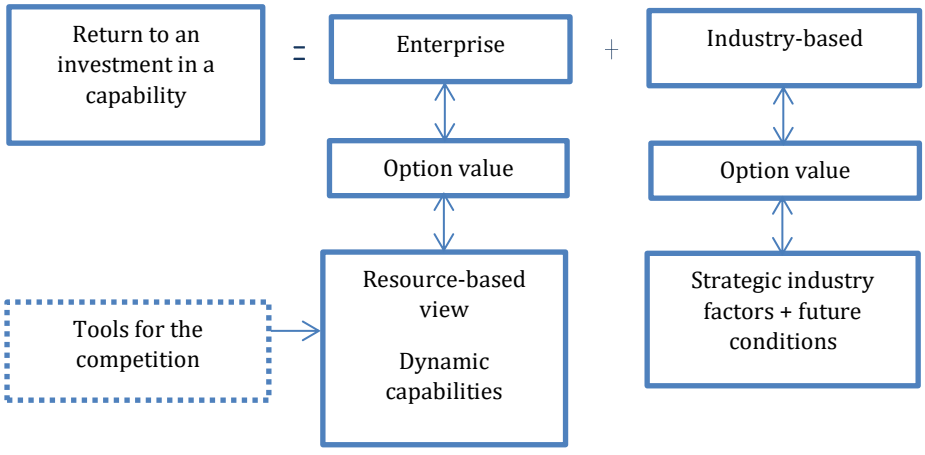


Figure 1. Return of investment in capabilities
(Adapted after Reuer & Tong, 2007)

The RBV and the KBV (knowledge-based view) together with DCs indicate the ability of the enterprise to compound and create resources, internalize new knowledge and develop new flexible strategies. The enterprise should develop using flexible strategies and identify the future opportunities offered by the environment. The performance of an enterprise influences the industry base.

In the process of valuation managers often use different indicators, but it is very important to emphasize the advantages and the costs of the option. According to RO literature, there is a mathematical formula for the value of an option (Nembhard & Aktan, 2010):

$$V = B - C \tag{10}$$

where:
V = option's value;
B = option's benefits;
C = option's costs.

Emphasizing the benefits and the costs of the real option, there is the following formula:

$$V = (B_p + B_c + B_s) - (B_l + C_i + C_m + C_e + C_s) \tag{11}$$

where:

V = the value of the option;
B_p = net performance benefits;
B_c = cost benefits;
B_s = strategic benefits;
B_l = lost benefits;
C_i = initial costs;
C_m = maintenance costs;
C_e = costs for developing changes;
C_s = strategic costs.

The presented model develops benefits and costs, but not all have a clear unit of measure (for instance, a problem is represented by the issue of measuring benefits and strategic costs). In the authors' opinion, the model does not discuss the time needed to recover the investments in options and capabilities. As such, the model is not clearly framed in time. Therefore, the model is appropriate in the academic environment, but difficult to implement in enterprises. Starting from the real option literature, a model has been proposed by the authors to help the decision-making process for an enterprise. This pattern starts from the following formula:

$$V_{or} = (B_{or} - C_{or})/P_{ri} \tag{12}$$

where:

V_{or} = the value of real option;
B_{or} = benefits offered by the real option;
C_{or}= real option costs;
P_{ri} = investment recovery period.

Emphasizing the benefits and the costs of the real option, there is the following formula:

$$V_{or} = [B_p - (C_{in} + C_m + C_e + P)]/P_{ri} \tag{13}$$

where:

V_{or} = the value of real option;
B_p = net performances obtained after the implementation of decisions based on real option;
C_{in} = initial real option costs;
C_m = maintenance costs;
C_e = external costs that may occur in the event of a change;
P = loss;
P_{ri} = investment recovery period.

The model's perspective focuses on providing measurable indicators. Concretely, performance can be measured using Key Performance Indicators (KPIs). In the model, the investment recovery period involving a decision-making process based on real options was the novelty element because managers should know when they will recover the investments. The mathematical model was realized after complex research on ROA.

Knowledge-based view (KBV)

The KBV represents a valuable element of sustainable competitive advantage from knowledge, regarding its creation, transfer, and integration [German, 2017; Alawneh, Abuali, & Almarabeh, 2009; Wong, 2005). Knowledge brings together elements that transform it into a key asset for the organization. The elements refer to data, information, experience, ideas, skills, or intuition (Gao, Li, & Clarke, 2008). In consequence, knowledge is explained as a totality of experiences, values, data, and information that presents a scenery for assessing and creating distinct experiences and valuable information (Davenport & Prusak, 1998; Doan, Rosenthal-Sabroux, & Grundstein, 2011).

The KBV theory explains its following characteristics. Knowledge gives one of the most strategic meanings in the organization. Production activities and processes in an organization require applications of knowledge. The human resources of the enterprise are responsible for creating, maintaining, and sharing it. The KBV is based on the resource-based view concept (Solesvik, 2015). The KVB approach offers a new direction to organizational innovations, trends, and has implications for all management practices.

The resource-based view (RBV)

The interest in resource management in this century was explained by the market condition. The initiator of the RBV concept was B. Wernerfelt (1984). According to his main idea, the source of economic rents are resources (Wernerfelt, 1984). RBV aims to identify and analyze various strategic advantages that an organization has through its capital, performance, capability, and culture (Supeno et. al., 2015). When examining resource characteristics, involves the attention to an organization's abilities because they decide the direction in which resources are reconstructed and replayed to obtain value to the organization (Kazozcu, 2011; Cyert & March, 1963). DCs represent an

essential element of the RBV because they create new sets of resources that are necessary for uncertain business environments.

Dynamic capabilities (DCs) and Strategic leadership (SL)

DCs are defined by Tecee (1990) as the organization's capableness to create, combine, and reconstruct competencies to respond to volatile business environments (Teece, 1990, 2007). The capacity to react and to come into contact with change is a critical element in uncertain environments (Teece, Pisano, & Shuen, 1997; Kuuluvainen, 2012). To apply the theory of DCs, it is necessary to comprehend the mechanisms of creating the capabilities and how to select the optimal way to gain competitive advantage (Zollo & Winter, 2002; Grewal & Tansuhaj, 2001). The value of DCs should express their connections with the organization's performance (Eisenhardt & Martin, 2000; Griffith & Harvey, 2001). In this way, there are multiple similar paths, possibly an imitation of benchmarking's practices (German & Boscoianu, 2015; Ambrosini, Bowman, & Collier, 2009; Ambrosini & Bowman, 2009; Easterby-Smith, Lyles, & Peteraf, 2008).

DCs concept is relevant to explicate internationalization because it presents another perspective in the internationalization literature (Miller & Park, 2002; Schweizer et al., 2010). Schweizer et al. (2010) present reasons that internationalization of an enterprise may be expected to sticky resources and in reverse enterprises may not internationalize as a response to those resources (Miller & Park, 2002). Teece compares Hymer's approach to dynamic capabilities-based inputs. He sustains that DCs concept can develop Hymer's analysis of internationalization (Miller & Park, 2002). In addition, Kuuluvainen (Luehrman, 1998) argued that DCs have an important role in the success of internationalization.

Strategic leadership (SL) represents the ability to expect, foresee, adapt and enable others to create strategic change when necessary (Hitt, Ireland, & Hoskisson, 2017). Good leadership could ensure a "vision to shape DCs and to orchestrate nontradable assets to increase performance to gain benefit from innovation" (Zentner, 2011) According to Hitt and Ireland, in a competitive environment, effective SL and especially strategic leaders should: create and present a vision, construct dynamic capabilities, use productive human capital, sustain technological progress, create flexible strategies, construct organizational culture based on ethical practices (Hitt, Haynes, & Serpa, 2010). In addition, SL should involve strategic thinking, acting, and influencing.

Strategic flexibility (SF)

Flexibility is explicated as the aptitude of the enterprise to accommodate uncertain and rapidly occurring market changes that have a significant impact on its performance (Aaker & Mascarenhas, 1984). Research on this topic indicates that are three interconnected elements in an enterprise. The first one refers to resource flexibility (Kogut & Kulatilaka, 2001). The second one indicates the process flexibility (Sharfman & Dean, 1997), and the third one is the strategic options (Sanchez, 1993). Luehrman (1998) sustains that flexible strategy can be understood as a portfolio of RO because strategies involve a sequence of decisions. Based on the strategic flexibility approach

and RBV, an enterprise should be able to be flexible in managing its resources in alternative uses to generate a range of strategic options (Kazozcu, 2011) The ability to recreate these core competencies dynamically leads to SF because it demonstrates the flexible use of resources and rebuilding of processes. In addition, it enables the enterprise to achieve a sustainable competitive advantage in turbulent markets (Teece, Pisano, & Shuen, 1997; Eisenhardt & Martin, 2000; Kazozcu, 2011). An essential element is represented by the ability of the organization decision-makers regarding the equilibrium between real flexibility and its representation in a model (German, 2017; Radomska, 2015; German, 2017).

Research methods

The study aims to identify the opinions of managers from Romania regarding the management process of companies in a dynamic business environment and to verify the impact of RO, DC, and SF on the enterprises' performance using a quantitative research methodology.

Objectives and research hypotheses

Objective: to determine if the RO – DC – SF perspective could be a tool to obtain competitive advantage and performance in an uncertain business environment.
Research Hypotheses:
H1: The greater the level of flexibility in the strategy development process, the greater decision-making freedom in implementation.
H2: The better the implementation of real options analysis, the better the decision-making process.
H3: The greater the organization's dynamic capabilities, the better its revenue dynamics.

Population and Sample

The data was collected through a survey in Romania. The sample provides an excellent opportunity to test the effects of the business perspective. Managers represent the population of the research from the IT industry. The research is based on managers aged between 30 – 50 years old, different education (bachelor degree – 45%, master degree – 30% and Ph.D. degree – 25%), different genders (65% male and 35% female), and different job levels (entry – 15%, intermediate – 32%, senior – 38% and lead level – 15%). For the sample size, a level of error of ± 5% was used. Also, the confidence level was considered 95%. The value of 1.96 correlates to these values according to the Z distribution table. For the absence of information regarding p-value, it will be considered 50% (German & Nechita, 2015; Funaru, 2013). 680 managers define the size of the sample.

Data analysis and processing

The data analyzed in this research was collected through questionnaires that were distributed directly towards respondents consisting of managers from the IT industry. The questionnaire had thirty questions focused on managers' perceptions and

behavior about strategic management in a dynamic business environment. Data were collected over a nearly 1-year period using both paper and online questionnaires. The data were analyzed using SPSS (Statistical Package for the Social Science) software. The statistical analysis was focused on the obtained data, consisting of questions statistics; hypothesis testing, and correlation between variables (Funaru, 2013).

Research findings and results

After analyzing the data, the results offer an interesting overview of the situation regarding the organization's approaches to the proposed business perspective and about the strategic management view from Romania.

Figure 2. Applied strategies
(German, 2017, p.128)

Figure 2 shows the strategies used by organizations before the research. It is seen that the respondents of the research focused on developing new strategies to increase their performance (14.30%) after they evaluated the strategic gaps (14.90%). The respondents were interested in developing a new vision and new objectives for the organizations to enter new markets (13.80%) and develop new products or services (13.20%). The percentage of the reduced employees is increased (11.70%) compared with the percentage of the expanded employees (8.90%). Reengineering the management system was a strategy applied in 9.60% of the cases. The research shows that the managers applied different classic strategies, but to face the challenges offered by the dynamic and volatile business environment they should focus more on flexible strategies.

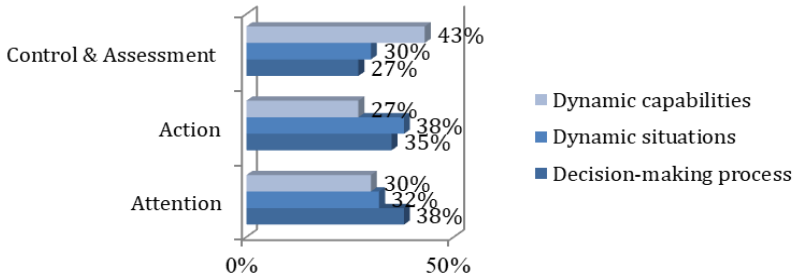


Figure 3. Strategic flexibility

The findings indicate that the attention indicator has positive values in the decision-making process (38%), dynamic situations (32%), and the use of dynamic capabilities (30%). Action indicator emphasizes actions taken by the organization in responding to active business situations. The highest value of this indicator was 38%. Control and assessment indicator, with a value of 43%, emphasizes controlling, assessing, and improving an organization's loss in the past. The value of this indicator proves the importance of DCs for strategic flexibility.

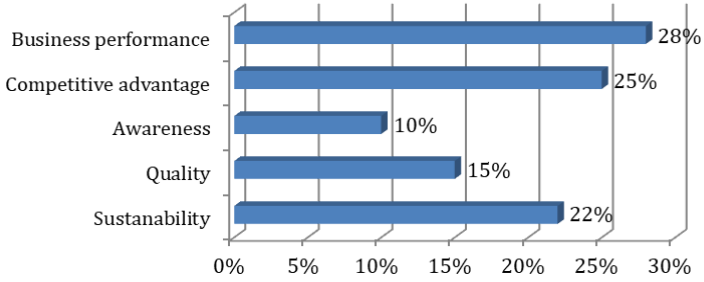


Figure 4. Benefits of using RO perspective

The respondents of the research considered that using ROA could be used in practice because it offered sustainability (22%), provided quality (15%) and awareness (10%), could be used for gaining competitive advantage (25%) and bringing business performance (28%).

Hypothesis testing

The examination of the hypotheses was based on measuring the t-statistic value. Table 1 shows the results of the hypothesis testing.

Table 1. Hypothesis testing

Hypothesis	*Standard deviation*	*T-statistic Values*	*Result*
H1: The greater the level of flexibility in the strategy development process, the greater decision-making freedom in implementation.	0,46758	4,218	Accepted

H2: The better the implementation of real options analysis, the better the decision-making process.	0,62538	3,822	Accepted
H3: The greater the organization's dynamic capabilities, the better its revenue dynamics.	0,47309	2,390	Accepted

As seen in table 1 (Hypothesis testing), all of the hypotheses are accepted.

Conclusion

The study followed the objectives and confirmed the hypotheses. The examination of the results shows that SF is correlated with the efficiency of the enterprises in a turbulent and volatile business environment. According to the results, it could be said that managers are interested in implementing the phases of SF in consequence of the turbulent business environment. The proposed perspective is valid.

Real Options Application

The research to test the influence of ROA was continued with an application. One IT company from Romania would like to introduce a new product on the market. The company had the option to continue the project or to abandon it. The IT enterprise used ROA in two cases, for volatilities of 10% and 25%, respectively, computed on logarithmic returns on the project's future cash flows. Suppose that the value of the underlying assets is 1,000 TEUR. The risk-free rate for the next five years is 3%. Using real options super lattice software, the analysis has the following steps (German, 2017).

Step I: The underlying asset lattice calculation

The value of the contraction calculation was realized utilizing a binominal lattice.

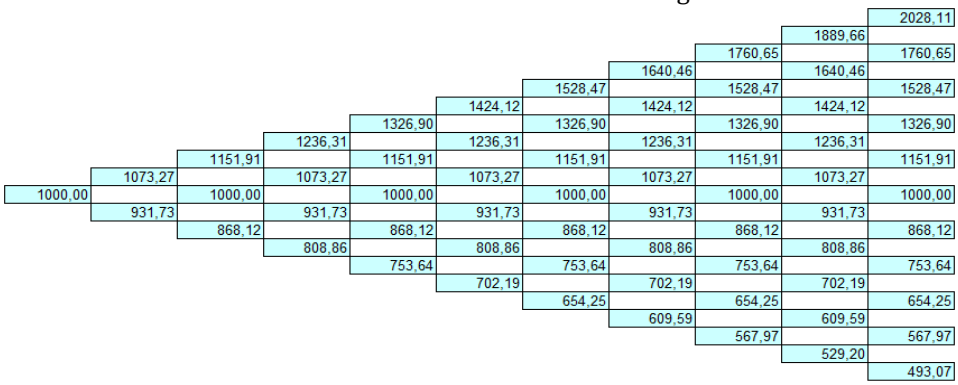


Figure 5. Underlying asset lattice – 10% volatility (Realized in Real options super lattice software)
(German, 2017)

Figure 5 shows the lattice transformation of the underlying using a volatility of 10%. Based on the binominal approach with ten time-steps was calculated the value of the contraction options.

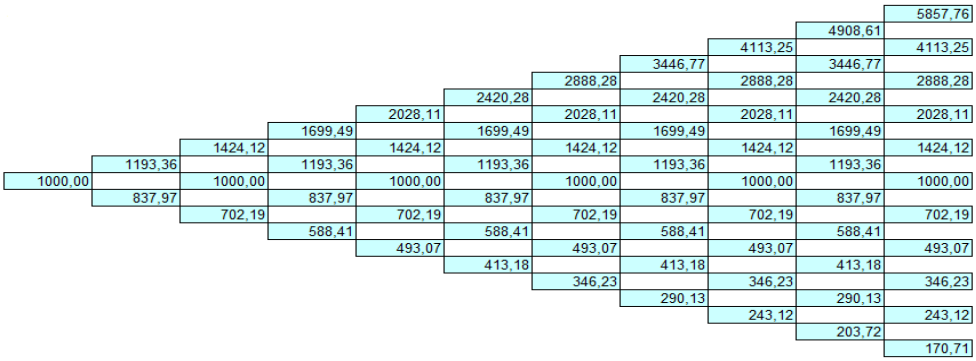


Figure 6. Underlying asset lattice – 25% volatility (Realized in Real options super lattice software)
(German, 2017)

Figure 6 demonstrates the lattice evolution in ten time-steps of the underlying based on 25% volatility.

Step II. Sensitivity determination

According to the inputs, the results are presented using Tornado charts. They determine the sensitivity analysis that compares the relative importance of variables using Real options super lattice software.

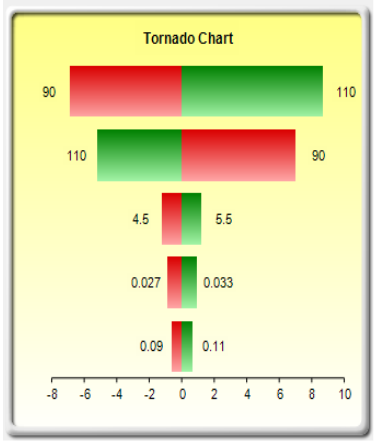


Figure 7. Tornado Chart – 10% volatility (German, 2017)

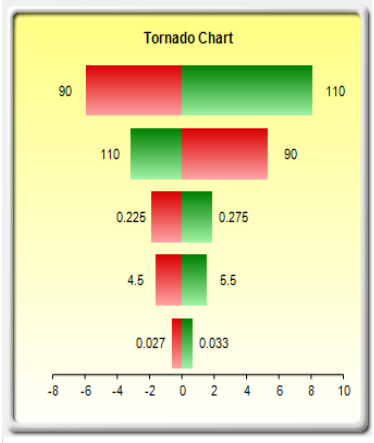
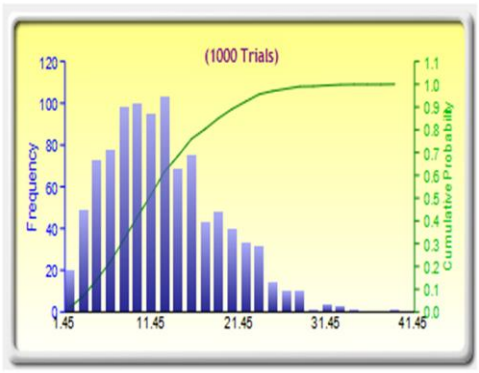


Figure 8. Tornado Chart – 25% volatility (German, 2017)

Figure 7 shows a good convergence at the volatility of 10% and it showed the variables with the greatest influence in the variability model. Also, Figure 8 shows a good convergence at a volatility of 25%.

Step III. Simulation method

The method takes into account variables such as the present value, the costs of the implementation, and the volatility.



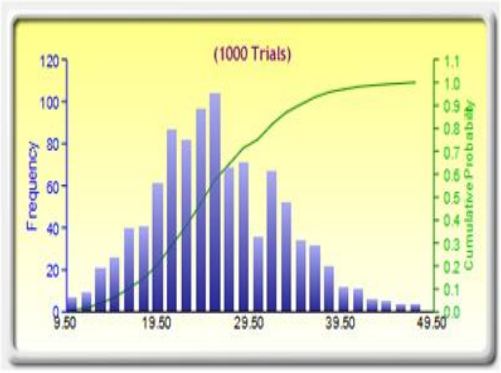


Figure 9. Simulation process –10% volatility ***Figure 10. Simulation process – 25% volatility (Realized in Real options super lattice software)***
(German, 2017)

Figure 9 illustrates that at 1000 trials, 10% volatility, the mean was 17.92; the standard deviation was 9.90 and the range was 60.44. Figure 10 indicates that at 1000 trials, with 25% volatility, the mean was 28.65; the standard deviation was 8.63 and the range was 47.18.

In conclusion, the project to develop a new IT product in a new market could be implemented.

Conclusion and further research

Strategic elements such as RBV, KBV, DC influence an enterprises' performance. Strategic flexibility should be a decisive element for decision-makers because of the rapidly changing business environment. Real options represent an instrument useful in the finance, economic, and management field because they represent an opportunity for managers to integrate and value flexibility in an uncertain environment [19, 27]. Real options present advantages in a dynamic business environment. The underlying variables used in the ROA are cash flows that are conducted by requirement and competition. RO grows the value of a strategic option by flexibility; the strategic option value is driven by market and competition.

The study presented a literature review about different aspects of some strategic management elements. The paper suggested a real options business view, which was tested in the market using quantitative research and a real options application. The paper contained a theoretical part based on complex literature research, quantitative research, an original mathematical model and an application realized on an IT enterprise. The paper follows the structure: introduction, literature review, quantitative research, real options application, and conclusion.

The perspective proposed for the enterprises was based on an analysis of their needs. The study proved that for enterprises, facing uncertain and rapidly changing business environments, developing flexible strategies and dynamic capabilities was difficult. In addition, decision-makers need to use their appropriate organization`s resources. They should anticipate the competitors' reactions, use their capabilities and resources, and focus on strategic leadership. A ROA application was made on a real IT enterprise from Romania. The results prove that ROA is a good instrument in practice not only in theory. The findings of the research are useful in practice for enterprises, but they are also useful in the academic field for students. "Although the academic literature on real option has grown enormously over past three decades, the adoption of formal real option valuation models by practitioners appears to be lagging" (Lambrecht 2017, p. 166). The findings of the research prove that real options represent a beneficial instrument for managers to allocate their company's capital and maximize their profit by dealing with uncertainty and reducing risk. The present COVID-19 pandemic is associated with uncertainty about the future. In addition, the findings of the research could represent a tool for managers in their decision-making process. The paper used elements from literature and market, quantitative research, a case study on real enterprises to realize a complex, original and useful tool for enterprises in a dynamic business environment. The paper offered originality, a complex literature framework, and useful perspectives to be applied in markets characterized by an uncertain, volatile, and dynamic environment. Often managers are not familiar with how to create an investment project involving options as potential choices.

The research investigated the benefits of using real options in the context of making decisions under uncertainty. First, unlike past research, that concentrates on specific real option areas (R&D decisions, international expansion, etc.), the current paper focuses on areas encompassed in management research during the actual period in Romania, Second, the paper is based on detailed quantitative research, which presents the perspective of Romanian managers regarding real options. It demonstrates that companies present interest in RO. With quantitative information about merging companies and real option variables, the strategic decision process could get more transparent. Third, the paper presents an original mathematical formula, created by the authors, for the value of an option. The model helps decision-makers to calculate the time needed to recover the investments in options and capabilities. Fourth, the application presents in detail the steps between the different phases of the real options decision process in the case of a company. This research contributes to bridging the real options approach with a dynamic capabilities' potential and demonstrates that ROA could be applied not only in the IT industry. It is suitable for environmental changes. In addition, it helps maximize market value-added.

Further research can extend the theoretical structure proposed here by injecting other elements in a network model and focusing on developing strategies for digital business. In addition, further research can continue by consulting and developing dynamic capabilities measurement indicators.

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