

The Model of Managerial Decision-making on Investment in Medium-sized Enterprises

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Abstract. The paper focuses on the definition of the model for managerial decision-making on investment in the medium-sized enterprises. The model consists of activities such as the identification of the problem or an opportunity, definition of the objective and variants of the problem's solution, determination of criteria, appraisal, and the subsequent selection where this is based on the enterprise's strategy. The model includes also the factors affecting this process (market's development, customers, employees, enterprise's owners and their relationship to the process, and others) and the resources necessary for this process (personnel, knowledge, finance, time, and information). The whole process is designed based on the conducted research comparing the successful enterprises in relation to the investment with those less successful ones. Among the fundamental findings affecting the designed model belongs the importance of linking the enterprise's strategy with the process of decision-making on investment in the successful enterprises, focusing of these enterprises mainly on the non-financial criteria during the appraisal of variants (impacts of the investment on the products and internal processes, on employees, and the previous experience), preferring the traditional methods for the appraisal of the economic efficiency of investment projects, and the absence of assessment of the risk level of the investment projects mainly in the less successful enterprises.

Keywords: Managerial Decision-making, Investment, Medium-sized Enterprises.

1 Introduction

The managerial decision-making on investment in its substance links the theory and practice of enterprises' management with the field of investment appraisal which deals with the efficiency of investment according to the specific methods used here. These two fields meet in the process when the managers or the owners of enterprises need to make decisions related mainly to the acquisition of new items of the fixed tangible or intangible assets. The definitions of the decision-making process within the management of enterprises reflect the opinions of the authors and academics. Therefore, this process can encompass various numbers of consecutive steps, often with a feedback for the previous steps. Or the individual steps create a closed cycle which is periodically repeated. According to some opinions, the process of the decision making

in management is divided into several phases that include the particular activities. A brief overview and comparison of these opinions follows below. The investment appraisal theory and methods are used to assess the efficiency of the investment. The methods here are static or dynamic, depending on whether the time is being considered in the calculations. The results of the methods used within the investment appraisal serve as the guidelines for the decision-making process. However, they often only cover the strictly economic aspects of the matter. To make the decision-making process and the selection of the right investment project more complex, other aspects need to be taken into consideration as well.

The process of managerial decision-making can be found at all managerial levels. However, the decisions being made at the strategic level has a significant impact on the business success and further orientation of the whole enterprise. Therefore, the process of making decisions on the investment of enterprises needs to be studied in a thorough way. According to Simon [17], the decision-making process can be divided into four phases: analysis of the environment for the identification of the conditions triggering the need to make a decision, definition of possible solutions, selection of the variant which best fits the requirements, and the assessment of the benefits and fulfilment of the objectives. This process is described as cyclic since the assessment of results can initiate a new decision-making process. The cyclic character of the decision-making process is supported by the opinion of Fotr et al. [6]. According to these authors, the process has eight individual phases, but the last two actually represent a part of the investment project's realisation and its monitoring.

The division of the decision-making process into four phases can be found also in the work of Nutt [13]. Within the definition of the fundamental steps of the decision-making process itself, the opinion of Rue and Byers [16] is in concordance with the description done by Nelson and Quick [12]. Thus, the fundamental steps of the managerial decision-making include the identification of the problem or needs to make a decision, definition of the objective, identification of possible solutions to the problem defined, testing of the correctness and efficiency of individual variants, and the most important part consisting of the selection of the best solution.

According to Blažek, the process of decision-making has six phases [2]. It starts with the definition phase, where the emphasis lies in the defining of the desirable future state in the form of an objective. This is followed by the analysis phase consisting of the gathering and proper interpretation of the information needed for the decision-making. The phases of generating possible variants should reveal the possible ways of achievement of the objective defined earlier. Then, these variants are sorted, assessed, and, finally, the decision is made as a binding selection from the variants. The distinguishing of six phases or steps within the process of managerial decision-making can then be found also in the opinions of Gibcus [8] and Bazerman [1]. Bazerman specifically pays attention to the differentiation of the assessment criteria within the process based on their perceived importance in the form of weights that are assigned to them. Pike and Neale deals specifically with the decision-making process in relation to the financial decisions. [14]

All of the above-listed opinions and characterisations are in harmony with the point of view presented by Donnelly, Gibson and Ivancevich. However, these authors add

the perspective of benefits of the decision made for the individual stakeholder groups. This is an important issue to be included in the process of the managerial decision-making on investment. Essential is to clarify which stakeholder groups and their specific interests will be considered during the decision-making process. Adding too many different perspectives can make the process too complex. On the other hand, omitting an important perspective for a particular situation can lead to the selection of a variant that will not bring the desired results. [4]

Robbins and Coulter in their description of the process build on the approaches listed above and distinguish eight steps. These steps represent all the important activities, starting with the identification of the problem. This is followed by the determination of the criteria, assignment of the weights to these criteria, definition of solution's variants, analysis of the variants, selection of the best one, implementation of the decision, and, finally, by the assessment to the effectiveness. [15]

Despite the fact that the opinions of various authors on the individual steps and parts of the managerial decision-making process vary, the common features can be identified. The whole process can be divided into three substantial parts. The first one deals with the definition of the problem, the second one is focused on the core of the decision-making, and the last part includes the implementation of the decision (the selected variant of the problem's solution) together with the assessment of its effectiveness. This division of the process is depicted in Figure 1.

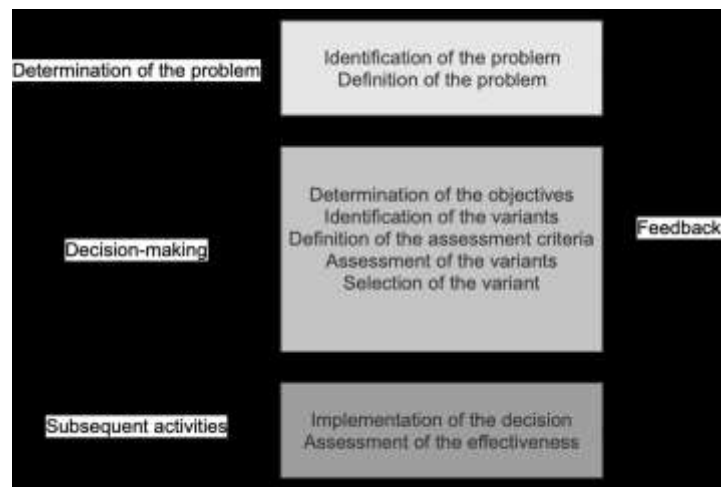


Fig. 1. The process of the managerial decision-making.

The theory and methods within the field of investment appraisal intersects with the topic of the managerial decision-making. The main intersection is represented by numerous methods for the calculation of the economic efficiency of the investment projects. This is an area that attracts the attention of many academics, researchers and other professionals. To follow the purpose of our paper, we will not present a complete overview of it. In general, the methods used here are divided into the static and dynamic ones regarding the fact whether they consider the present value of money and whether they try to incorporate the risk into the appraisal of the investment. In relation to this,

Lefley points out the existing disagreement between the academics and practitioners. Among these groups, mainly the net present value (NPV) and the internal rate of return (IRR) are being used. However, the author introduces the “marginal growth rate” (MGR). According to him the managers should use the NPV and the MGR. [10]

Espinoza suggests an alternative method for the appraisal of economic efficiency of investment as well. This is noted as the decoupled net present value (DNPV). The point is not to use the utility theory for decreasing the value of future cash flows, but to focus on the risk associated with the investment project [5]. As it was mentioned earlier, the methods of investment appraisal consider mostly only the economic criteria. However, the investment projects and their results could be assessed from many other perspectives. Weninger and Huemann put emphasis on the sustainable development. Except for the economic principles, the sustainable development includes the ecologic and social orientation. It is a value-based concept working with the values such as fairness, trust and transparency. Therefore, the investment projects could be assessed in terms of being socially responsible and ethical. [20]

2 The Methodology for Designing of the Model for the Managerial Decision-making on Investment

Based on the analysis of the theoretical background within the field of managerial decision-making and within the field of investment decision-making, a general model of the managerial decision-making on investment was designed. This model represented an input for the research focused on the verification of the individual activities of the process of decision-making on investment, identification of the substantial elements, tools and methods used in this process, relationships between them and the impact on the achievement of the right decisions via this process. The object of the quantitative research performed was the decision-making on investment in the medium-sized enterprises operating in the area of the Slovak Republic. The size of the enterprises was selected in relation to their relative independence in the decision-making on investment and the presence of the management (executive officers) in these enterprises separated from the enterprises' owners to a certain degree.

The data garnering was conducted via the inquiry using a questionnaire and also via the semi-structured interviews in the selected enterprises in 2016. The questionnaires and the interviews were composed of 7 parts that were focused on the characteristics of the enterprises, the beginning of the process of the managerial decision-making on investment (the triggers of the process), the ways of identification of the investment variants, the appraisal criteria, the factors influencing the process, methods of the appraisal of the economic efficiency of the investment and the evaluation of the risk. There were 147 enterprises participating in this survey. The interviews were conducted in 10 of them. The questionnaires were addressed mainly to the decision-makers, thus primarily to the managers, owners or the company economists.

To identify the differences in the process of the decision-making on investment among the enterprises, these were divided into the so-called “successful” and “unsuccessful” ones. To create this division, there were specific questions in the

questionnaire pertaining to the assessment of the economic situation of the enterprises based on the revenues, profit and the return on equity as an indicator comparing the profit of the enterprises with the capital invested. The enterprises also had to realise investment projects during the previous 5 years. Therefore, the dividing of enterprises into the successful and unsuccessful ones was also influenced by the satisfaction of the managers or owners with the realisation of these investment projects during the previous 5 years. Based on these criteria, 71 enterprises were identified as the successful ones and 39 enterprises as the unsuccessful ones. The comparison was performed within the individual activities of the researched process, as well as the appraisal criteria of the successful and unsuccessful enterprises, the methods used for the appraisal of economic efficiency, and the attitude of the enterprises towards the risk.

3 Research Results on Investment Decision-making

Based on the conducted research, the following findings were identified that serve as the basic inputs for the design of the model for the managerial decision-making on investment in the medium-sized enterprises:

- up to 64% of the unsuccessful enterprises do not have the strategy defined at all, or they do not have it defined in a particular document, whereas on the other hand, 59% of the successful enterprises have the strategy clearly defined in the form of a specific document. The personal interviews also revealed that the enterprises that have the strategy defined, follow it when making decisions on investment.
- in relation to the determination of the reasons for the beginning of the process of decision-making on investment, it was revealed that a huge part of the unsuccessful enterprises selected the necessity of renewal of the fixed assets (51%) and the identification of shortages within the enterprise (46%) as the most frequent reasons. The successful enterprises consider the seizing of the opportunity in the market (34%) to be the most frequent reason.
- in the current form of the decision-making on investment process, especially the owners of the enterprises are involved, together with the managers. The owners are involved in the process in up to 73% of the successful enterprises and the managers are involved in the process in 67% of the successful enterprises. In the unsuccessful enterprises, the owners are involved in the process in up to 79% and the managers are involved only in 46% of these enterprises. It was also found out that in the unsuccessful enterprises, the most frequent position involved in the process is the owner himself, whereas in the successful enterprises it is the owner accompanied by the manager.
- when determining the possibilities for the investment, the successful enterprises mainly base this on the solutions of their competitors (62%) and on the intuitive ideas generated via the brainstorming (62%). The most frequently used way of unsuccessful enterprises is the analysis of the competitors' solutions (46%), too. However, in contrast with the successful enterprises, only 23% of the unsuccessful ones use the brainstorming. Another finding is that the enterprises use the term

“brainstorming”, but they do not respect all its principles. Therefore, we can rather talk about creative meetings.

- when assessing the investment variants, the successful as well as the unsuccessful enterprises, focus primarily on the amount of the investment (the amount of funds needed) and its payback period. Significant differences within the comparison of the successful and unsuccessful enterprises were identified for the criteria such as the impacts of the investment on the employees, enterprise’s reputation, corporate social responsibility and the previous experience. These criteria are much more important for the successful enterprises than for the unsuccessful ones. On the contrary, the risk of the investment and the difficulty of gathering the funds needed for the investment were much more important for the unsuccessful enterprises. It was also revealed that the successful enterprises can accept an investment which does not have a very favourable amount (the funds needed) and the payback period, but its realization has a significant positive impact on the enterprise.
- during the definition of the impact of factors on the process of the decision-making on investment in the enterprises, it was revealed that the unsuccessful enterprises put much less emphasis on the internal and external factors than the successful enterprises. Considerable differences were identified mainly within the factors such as new technology, the level of information available, market’s development, customers, corporate climate and the owners’ requirements. The acceptance and recognition of the impact of these factors can significantly influence the success the enterprises can achieve.
- the successful, as well as the unsuccessful enterprises, use mainly the static methods such as the indicators of return and the investment’s payback period during the appraisal of the investment’s economic efficiency. The dynamic methods of the appraisal are being used less often in the enterprises. However, when comparing the successful and the unsuccessful enterprises, a considerable difference was identified in the use of the Net Present Value and the Profitability Index. These methods were used by the successful enterprises much more often than by the unsuccessful ones. Based on the personal interviews, it was also revealed that the enterprises do not often use the dynamic methods because they consider them to be difficult and the static methods are sufficient for them.
- in the process of decision-making, the risk needs to be analysed as well. The decision on the investment and the realization of the investment itself represent a relatively high level of risk. The researched enterprises prefer the verbal characteristics when defining the risk (79% of the successful and 42% of the unsuccessful enterprises) and the numeric characteristics (54% of the successful and 41% of the unsuccessful enterprises). Then, to perform the risk analysis the enterprises mainly use the scenarios that are linked with the verbal characteristics mentioned earlier. This technique is used by 45% of successful and 28% of unsuccessful enterprises. The successful enterprises often use sensitivity analysis (40% of these enterprises) too. An interesting finding is that up to 46% of the unsuccessful enterprises do not analyse the risk. This means that they only define the level of the risk verbally. For a comparison, this is the case of only 18% of the successful enterprises.

4 The Model of Managerial Decision-making on Investment in Medium-sized Enterprises

Based on the conclusions from the research, the model for the managerial decision-making on investment in medium-sized enterprises (see Fig. 2) was designed. The design of this model takes into account the basic elements related to the decision-making process, such as the goal of the decision-making, the criteria of appraisal, the subject and object, variants for the decision-making and their consequences, and the risk situations. The model of the managerial decision-making on investment specifies the phases and activities of the process of the managerial decision-making on investment, starting with the identification of the problem as the trigger of the whole process, and ending with the decision itself and its subsequent implementation. The whole process is divided into three phases: the analytical one, the designing one, and the appraisal one.

The first phase is the analytical one, encompassing the trigger of the process of the managerial decision-making on investment. This trigger is represented by the identification of the problem or by the identification of an investment opportunity in the market. This activity should follow the business strategy and it should be in harmony with it. The strategy is directly related to the achievement of the strategic goals of the enterprise. These goals follow the enterprise's vision, philosophy and mission. In the research, it was revealed that the successful enterprises that have the strategy defined and captured in the form of a particular document strive for obeying it, thus they make such investment decisions that are related to the fulfilment of the strategic goals. This phase is a prerequisite for the performing of the managerial decision-making on investment itself.

Another activity following the problem identified within the process is the definition of the process's objective. This represents a state that shall be achieved via the solution of the problem identified. When determining the investment objectives, it is necessary to separate main objectives and supportive, which serve to achieve them.

The purpose of the next phase (the designing one) is the identification of the ways of solving the problem determined, serving for the achievement of the objective defined. In this phase, the investment variants are being identified. The quality of the investment decision depends on the determined possibilities of the solutions to the decision-making problem. Therefore, it is necessary to pay attention to the identification of appropriate variants. This activity starts with the recognition of the variants of the solution to the problem by the team of people solving it. If the team of people solving the problem do not know the variants of the solution beforehand, we can talk about a specific problem that will require the designing of new variants of solutions via the methods applicable for the determination of variants. If the team of people solving the problem know the variants of the solution to the problem, it is necessary to focus on the analysis of the information pertaining to the new solutions, and to find out whether it is possible to design new ways of the solution. It is probable, that the situation in the external environment or inside the enterprise has changed. Or, the people solving the problem could gain additional pieces of information. The reason is that the phase of analysis and information gathering are being performed simultaneously. Then, based

on the additional pieces of information, it is still possible to identify other variants of the solution, and the appraisal follows only after that.

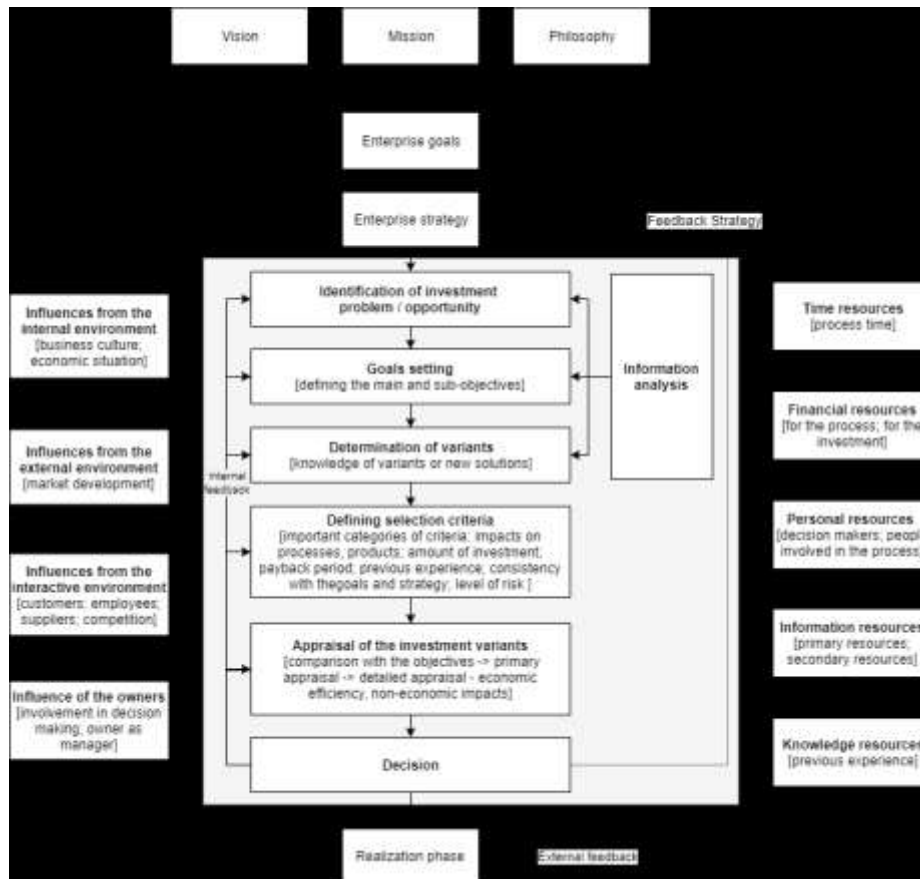


Fig. 2. The process of managerial decision-making on investment.

If it is necessary to determine the variants in relation to the existence of other possible ways of solving the problem, the enterprises should use the methods serving for their identification. The research showed that the enterprises often use a certain way of application of intuitive methods similar to brainstorming during the solving of the investment problems. However, the term brainstorming cannot be fully applied here since the enterprises do not respect the substantial elements of this method. A recommendation for the enterprises in relation to the brainstorming is to focus on the correct application of this method or to try other methods, such as the Gordon's method.

After the identification of the investment variants it is possible to start with the appraisal phase. The first activity in this phase is the definition of the selection criteria. This activity serves for the determination of the appraisal criteria, weights of these

criteria, ways of the measurement, and other important elements of the appraisal using which it will be possible to appraise the individual investment variants and to compare them. Based on the research, it was revealed that the successful enterprises prefer the non-financial criteria during the investment appraisal to a greater extent than the unsuccessful enterprises. An exception is represented by the amount of investment which is considered important by both groups of enterprises. With regard to the results of the research, in cooperation with 3 managers of enterprises the list of criteria groups for the appraisal of the investment variants was created. Here, the most important criteria are the impacts on the processes and products of the enterprise, the amount of investment and the payback period, the previous experience, consistency with the goals and strategy, and the level of risk.

The second activity is the appraisal of the investment variants. For the appraisal, the process consisting of the following steps was designed: examination of variants in relation to the defined objective of the process, primary appraisal of variants focused on the economic efficiency using the traditional methods of the appraisal, which serves for the identification of the absolutely inefficient variants. Then, the investment variants are being appraised more thoroughly from the perspective of the economic efficiency of investment via the dynamic methods of the appraisal and from the perspective of the non-economic impacts via the multicriterial assessment.

The last activity in the process is the decision itself, which means the selection of the investment variant that achieved the best results in the appraisal of the determined criteria. The selected investment project then enters the process of its implementation.

In the model, also the resources needed for the managerial decision-making on investment are depicted, either those from the external or from the internal environment. These can significantly influence the process of the managerial decision-making on investment in the enterprises. The model includes also three types of feedback. The first one is the internal feedback that provides the check within the process of the managerial decision-making on investment between the individual activities. Then the feedback coming from the last activity of the process is defined. Here, the best investment variant is selected, so its concordance with the enterprise's strategy shall be checked. The last feedback relates to the realisation phase. The information gained here can be compared with planned state and with the presumptions used within the process of the managerial decision-making on investment.

The final form of the model for managerial decision-making on investment was verified at first via the comparison with the theoretical models of managerial and investment decision-making created by various authors. It was necessary to check whether the created model includes all the important elements of the managerial decision-making process and the substantial elements of the investment process. The model was supplemented with the tools, techniques and methods characteristic for the process of the managerial decision-making on investment that shall contribute to a better result of the decision-making process and to a faster and less costly implementation of the process.

Subsequently, the model was tested for its applicability in the business practice based on the interviews with the managers of enterprises that participated in the research. The verification here lied in the comparison of the current procedure for the implementation of the decision-making on investment process in the successful enterprises and the

designed model for the managerial decision-making on investment. The biggest problem perceived by the managers was the application of the dynamic method for the investment appraisal since they had been using it scarcely in the past or they had not been using it at all. In the majority of cases, the indicators of profitability sufficed for them. Also, the managers consider the dynamic methods of the appraisal as relatively difficult. Therefore, we designed a certain way of the calculation of the net present value for the enterprises using the MS Excel. Here, the managers can easily try this method and compare the value of the investment variants even with a certain change of the risk, using the sensitivity analysis.

5 Discussion

The whole process of the managerial decision-making on investment could be viewed as a suitable object for the principles of the project management. However, this requires the existence of a competent project team. In relation to this, Lefley [11] researched the conflict in teams performing the appraisal of the capital investment in large UK enterprises. Professional collaboration of people from various departments can enhance the decision-making process. The author calls this the “departmental conflict”. If this is approached the right way, it improves the performance of the team of the decision-makers solving an investment problem. The application of this approach in the medium-sized enterprises that were studied in our research would be complicated, because these enterprises do not have that kind of differentiated professionals available to create a whole team of decision-makers.

Other researchers focus on applicable methods that could improve the process of decision-making on investment. Here belong, e.g., the research of Shvetsova et al. [18], Costantino et al. [3], and Fotr et al. [7]. Shvetsova et al. recommend using multi-criteria decision-making methods and combine them with interval preferences for the process pertaining to the investment [18]. However, the application of this approach requires rather complicated calculations. Costantino et al. [3] uses the perspective of the project critical success factors used as the criteria in the decision-making process. This includes the strategic objective, experience of managers, and the indicators describing the competition in the market. The author suggests the application of a decision support system in the form of an artificial neural network that would work with the defined criteria. Fotr et al. [7] deals with a particular risk mitigation approach known as the scenario approach. The team of authors describe the steps of this approach and consider it a suitable tool for the management of the risk associated with the investment, and even for the improvement of the strategic planning itself. The problem with more sophisticated and more intricate approaches for the decision-making process is their applicability for the conditions and limitations of the medium-sized enterprises. These do not have all the required resources – whether it’s the technology and software for the calculations and predictions, or the personnel with this kind of skills and knowledge, thus the human capital.

Finally, researchers also deal with specific types of investment. Kauffman et al. focus on the investment in information technology [9]. The authors point out various specifics of this type of investment, such as the changes they elicit in the performance

or the market conditions in the future. Therefore, they state that the traditional methods or the previous experience of the decision-makers do not suffice here. Smyth and Lecoivre researched the specifics of marketing investment [19]. These authors revealed that the short-term criteria related to the financial (economic) part of the issue were not aligned with the long-term orientation. The specifics of particular types of investment surely influence the whole process of the decision-making on investment, but enterprises (and especially the medium-sized ones) firstly need to pay attention to the process of the managerial decision-making on investment as a whole. They need solid and practical foundations they can later adjust for the specific needs of a particular situation. And this was the purpose of our research presented in this paper.

The whole research was conducted within the conditions of the Slovak Republic, therefore the designed model of the managerial decision making on investment is applicable in the environment of the Slovak enterprises. The researched enterprises had the commercial nature and the application of the model for the state administration would not necessarily bring the expected benefits regarding the specific characteristics here. Since all the research activities were focused on the medium-sized enterprises, the general model for managerial decision-making on investment can be applied only in this type of enterprises. Large enterprises have thorough and complex procedures related to the investment decision-making and the process of managerial decision-making is often performed outside the Slovak Republic in the parent companies. On the other hand, small enterprises are being managed mainly by their owners, so they are the performers of the whole process. The owners do not feel the need to define the procedure of activities within the process of decision-making on investment and they act upon their own experience, opinions and attitudes. Therefore, the medium-sized enterprises represent a suitable environment for the application of the designed model for managerial decision-making on investment.

6 Conclusion

The aim of this paper was to present the results of the research focused on the managerial decision making on investment. Based on the main findings gained from the literature review and quantitative data gathered via a questionnaire survey, we designed a model describing the process of managerial decision-making on investment. Subsequently, we tested its applicability in the operation of enterprises via interviews with managers participating in the research. The model we designed will help the managers or the owners of enterprises to build solid foundations for the support of the process of decision-making on various investment projects that affect their success, performance and the position among the competitors.

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