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## **INVESTMENT PLANNING AS A CONTRIBUTOR TO RISK MANAGEMENT**

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***Abstract***

*In order for Risk Management to meet the requirements it has been given, it is joined by Controlling, that has become its fundamental service tool. Controlling has developed numerous tools that are being updated and improved on an everyday basis, together with the education of controllers.*

*Development is inevitable and it is the only response to the crisis of our global environment. Development requires investments, and not the „stranded“ ones, but the ones generating new jobs and added value, thus increasing wealth. Investments should be planned, and planning is a particular problem that transition economies face. Should one be investing in the times of crisis and how should one decide on whether to make an investment or not? If this is so, then how should he protect his investment from negative impacts? How should one make plans and carry out the planned investments? Those are the questions that require answers and this paper is an attempt in providing appropriate answers to those questions by explaining the connection between investment planning and risk management.*

*The condition of crisis has become a regular occurrence, where businessmen are forced to make do and to work in order to survive, and some of them are impelled to make the most of it and utilize it as a development opportunity. Being fast not only in making decisions, but in making successful decisions, is based on future projections and utilization of the said ability in achieving competitive advantage on the market. Risk Management has become a necessity, and is legally regulated in developed countries.*

***Key words: investment decision-making, investment planning, development, risk management, controlling***

## 1. INTRODUCTION

According to the principles of market planning, the planning issue, and investment planning in particular, is a novelty for the transition economy organizations. Following the breakup of the former socialist system in Europe, the so-called social, i.e. national planning decreased. In order for the transition economies to be able to complete the transition process, they need to accept the laws of market, as well as the planning regulations.

When discussing the planning, it is essential to integrate the goal into the plan. On the way towards the goal the time is set that brings dynamic changes, and the time together with a dynamic environment brings along inevitable risks. We often ask ourselves if the future is uncertain, and therefore the planning as well, then why make plans at all?

Still, the planning is necessary, since without it we would not know what path to take or how and when to get where we want.

The reality of running business in the times of crisis indicates the problem of development, that is the problem of insufficient investment. Therefore, as a subject matter of the paper we will present the market-directed investment planning, taking place in a dynamic and turbulent environment. The purpose of the paper is to point to the fundamental aspects of this issue, and our goal is to determine the steps to take in order to get from an idea to a successfully completed investment.

The paper consists of an introduction, a conclusion and six chapters. The intention of the research is to contribute to the extending of knowledge of the planning theory in Croatia that has been scarce, as well as to its practical application that requires an ever more intensive solutions for the process of planning in times of crisis.

## 2. INVESTMENT PLANNING

The investment decision-making process is basically the process of capital accumulation utilization decision-making. It is essential for this definition to emphasize that the decision-making regards the utilization of the capital accumulation, which means that a development decision-making is not considered an investment decision-making unless it implies capital expenditure.

### 2.1. Investment Planning and Risk

The basic characteristic of investment is that investment and capital expenditure do not bring benefits immediately, but after a certain period of time. Because of this, there is a shift between the investment period and the benefit period, and it is logical to conclude that the period of investment (expenditure) is the first to come, and afterwards the period of benefit. Taking into consideration the fact that the utilization of capital accumulation assumes the utilization of other production factors, we can as well define investment as a sacrifice of current production factors for the eventual increasing of benefits in the future. Due to the afore-mentioned time shift between the period of investment and the investment effectuation period, a problem occurs regarding the risk that the planned investment might not be effectuated. The risk can be defined as the knowledge of a state where each decision can cause a range of certain effects to take place. (Jurković, 1984., 218.) In so doing, each result can occur with a known probability. Therefore, the risk can be considered a quantitative measuring of a certain result (consequence) such as: profit, loss and other in a way that the probability of the result can be predicted. From this definition of the risk the fundamental feature of the term is generated, which is the measuring and prediction.

One of the most commonly used measures of risk is the standard deviation. As far as the risk is concerned, in theory and practice there are two different methods of determining the possible risk when making a certain business decision.

The first method of determining the risk is by means of deduction, that is *a priori*, with the second method being *a posteriori*, meaning that the risk is determined based on the empirical measuring and results obtained.

The first method of determining the possible risk is for the decisionmaker to be able to assess the probability of a result or an event with certainty, without having to refer to historical data. Therefore, this method relies on assumptions, providing the characteristics of each possible event

are known in advance. It is clear that this method of determining the risk is hardly useful and unreliable in practice, since there is a small likelihood of a probability *a priori*.

The second method of risk evaluation takes into consideration the past, i.e. historical events as the basis for the decision-making. This method, despite all its defects, has a much wider significance in making decisions in practice.

With bigger amount of relevant data at a decisionmaker's disposal, the assessment of risk is more reliable, and the decision made is of more quality, and therefore the modern business theory and practice require the application of the *a posteriori* approach to the business risk assessment. In order to have a high-quality application of this method, it is necessary to know the result frequency distribution parameters based on statistical measuring and assessment.

We can assume that each business decision is in itself an investment decision (not a speculative one), but an investment decision corresponding in meaning and definition to the one given by B. Graham in his famous book called *The Intelligent Investor* (Graham, 2006., 38.) - „an investment operation is one which, after thorough analysis, promises safety of principal and a satisfactory return.“

Therefore, it is important to determine the size of the risk for a business, i.e. an investment decision in failing to generate an expected return/profit.

Since the planning of an investment project is an extremely multidisciplinary activity that requires an adequate work organization, regardless of the fact that each individual investment undertaking is specific, there is a certain number of aspects of planning that are included as a form in the standard procedure of planning an investment undertaking. Within this kind of planning we can distinguish between two basic groups, such as: a) natural aspects (market analysis, geological analysis, technological analysis, location analysis, ecological analysis... etc.) and b) financial aspects preceded by the afore-mentioned natural aspects. Both groups of aspects need to be thoroughly examined in order for us to be able to obtain reliable answers to the fundamental questions of cost-effectiveness and sustainability of each investment undertaking.

A clearly defined conceptual decisions are the basis for the operationalization of a specific system of investment project planning. As inseparably linked to the process of growth and development, and defined as a consistent combination of the planned and analytical procedures, the system of investment project planning needs to present a norm that will standardize the practical behavior of all the business entities involved. The goal is the optimization of investment decisionmaking with the aim of reducing the characteristic discrepancy between „what should be“ and „what really is“, which is an investment reality. In the existing multilayered and complex business structures and under the specific Croatian circumstances, it is important to take into consideration the various aspects of the investment project planning system, with restricting of the role of its specific business entities.

## **2.2. Methodological Assumptions in Investment Project Planning**

Following the analysis given above, we can define the methodological assumptions for the investment undertaking operational planning. They also presuppose the requirements that the methodology of such planning is to meet in order to obtain a professionally and methodologically correct analysis of the investment project.

1. Time preferences of a development decision-maker. The sacrifices made as factors that affect development and the benefits arising from it occur in different periods of time, and development decision-makers have their time preferences. The costs and benefits closer to the present time have greater significance than those occurring further in future. Such an occurrence can be presented best by means of the Benefit – Cost Ratio (B/C Ratio) (Martić, 1980., 30.) which is mathematically defined as follows:

$$B / C \text{ ratio} = \frac{\sum_{k=0}^n \frac{B_k}{r^k}}{\sum_{k=0}^n \frac{C_k}{r^k}} \quad (1)$$

2. The alternative utilization of development factors. With regards to the limitations of the development factors, the analysis of their alternative or optional usages is required, with the aim of achieving the maximum possible effects. The analysis of this type is necessary so as to minimize the so-called opportunity costs the amount of which implies a better and more effective utilization of resources than the planned one.

3. The alternative utilization of previous flows. Development factors utilized in the previous time period can, but do not have to, have an alternative utilization. If such flows can be utilized for some other purposes, the economic value of such costs equals the benefit amount in the other utilization. However, if they cannot be utilized anywhere except in the investment project that is being planned, then their economic value equals zero.

4. Marginal effects of the project. The performance and effectuation of each investment have their positive and negative effects on the overall economic processes and economic growth and development. Those effects occur as marginal (boundary) effects, which are additional effects of an investment on the existing conditions. Such effects would not appear if there would be no investment project. Therefore, when planning an investment, it is necessary to analyze all the possible marginal effects of the investment. The analytical method most frequently used for that purpose is the comparison of the position with and without the project carried out, so as to be able to identify the marginal effects of the project. Such an approach is particularly represented when analyzing the structure and range of demand, placement and production.

5. External costs and savings. Some of the effects of the investment project are impossible to be expressed in the form of values, as they are not exchanged on the market. Since such effects affect the overall economic growth and development, it is necessary to integrate them into the investment project and express them in the qualitative form. It needs to be emphasized that the term „costs“ refers to the negative effects, and the term „savings“ refers to the positive effects.

6. The commercial and socioeconomic effectiveness. It is absolutely clear that the market cannot always and under all conditions affect the socioeconomic effectiveness, and sometimes a significant difference arises in the effectiveness of benefits from the aspect of the company (investor) and society. This is why it is essential to analyze both types of effectiveness when designing an investment project.

7. Risk and uncertainty. The planning of investment projects logically implies a future time, which we cannot predict precisely. Due to the extraordinary significance of this methodological assumption that regards risk and the measuring of risk in investment projects, we have elaborated on the subject in the previous chapter of the paper.

8. Investment life-cycle enclosure. The methodological approach to the planning of an investment project starts from the assumption that the overall production has been effectuated, and financial obligations fulfilled. It presupposes an enclosed life-cycle of specific phases of the investment project.

9. Reinvestment. When assessing the effectiveness of an investment undertaking, the capital accumulation of the project is measured, without analyzing further investments in the accumulation. It means that the matter of size, direction and time of reinvestment of the accumulated profit in an investment undertaking is subject to the business policy of the investor.

10. Methodological consistency and applicability. The methodology of planning the investment projects needs to correspond to the other parts of the economic system in the market economy, because in this way it can provide for a rational economic and social growth and development. The bond is set up by means of clearly defined limitations presented to the investor (company), and those limitations at the same time act as social parameters of planning investment projects. Since the investment project is an operational expression of the development concept, the planning methodology should be applicable in a concrete reality.

11. Interdisciplinary approach. The variety and depth of the issues arising while planning investment projects generates a need for a closer cooperation of experts in various fields. This is why teamwork is a prerequisite for a quality planning.

12. A single information system. The dynamics of the modern development process leads to fast changes in the context of investment undertaking, which is to be kept in mind constantly and recognized when planning an investment. Therefore, the building of a single and comprehensive information system is an unavoidable prerequisite for a rational decision-making in planning.

The above-mentioned and briefly described methodological assumptions represent the exposed operational methodology of planning and assessing of investment projects. A consistent application of the exposed methodology in the preparation and planning of investment enables a risk minimization (up to a feasible limit) to a minimum, and it provides the management structures with monitoring and timely interventions in investment processes, that is in making strategic decisions on the course and intensity of development, and in obtaining a clear answer to the questions such as: What?, How much?, When?, Where?, and How? in trying to reduce the risk interval that each development (investment) decision brings. Investment projects, as a concrete elaboration of possibilities and conditions of development activities to take, need to offer operational answers to the afore-stated questions.

Within the context of the previous analysis, we believe that it is necessary to bear in mind the quote made by J.M. Keynes, saying that: „there is nothing so disastrous as a rational investment policy in an irrational world“. (Damodaran, 2006. ix )

### **3. INVESTMENT PLANNING AS A CONTRIBUTOR TO DEVELOPMENT**

Decision analysis regarding new capital investments, as well as regarding disinvestments, includes a complex sequence of problems and selection possibilities that the management needs to address adequately. Since capital investment requires a long-term engagement, it has to be in line with the overall business strategy of a company. Thus, it needs to be evaluated from the aspect of the strategic development of a company.

The strategic development perspectives include the investing in land, equipment, buildings, natural resources, research departments and other assets developed for the purpose of a future economic benefit. Such perspectives are adopted by the management, but they are also periodically revised and evaluated by the management. The selection of an investment needs to correspond to the course the company is to take, taking into consideration the expected business conditions, perspectives of the company, and the position of the company within a specific sector, as well as regarding the competition.

Companies usually have access to an infinite number of business investments to choose from. Thus, for example, a company can invest in a new plant for the purpose of increasing the capacity, relying on the fact that such an investment will generate profit and thus provide an economic justification for the investment. It can also invest in the replacement of obsolete and old plants for the purpose of increasing the efficiency, considering that it will reduce production costs, thus providing a justification for the investment. On the other hand, some business strategies assume the penetration onto the new markets, and as a consequence, investments in new plants or in the reconstruction of the existing plants. Some other strategies imply the construction of buildings and equipment designed for the research and development of new products, expecting they would contribute to the development of the company. Besides the above-mentioned, capital investments can include significant promotion investments with the purpose of increasing the market share and profit. These, as well as other options, arise in the process of strategic planning and setting realistic business goals.

The process that includes the selection, definition and analysis, as well as the selection among several capital investments is called investment planning (Helfert, 1991., 252.) The said process includes the entire area of decision-making from the very idea till the very economic analysis. It is clear that the investment plan of a company includes the acceptable group of investment projects that require for each one separately, as well as for all of them together to result in a satisfactory economic and financial effects. Business capital investment planning is in fact the

selection of those investments that bring an acceptable amount of economic benefit with an acceptable risk rate. (Helfert, 1991., 252.)

The selection among various investment options with limited resources also includes the so-called opportunity cost that presupposes the cost of the alternative utilization of the resources.

The capital investment planning is the investing and spending of resources for the purpose of future cash inflows or through the increase in profit or the capital market value. The analysis of the possible capital investments includes a significant prediction rate for predicting future conditions. To put it briefly, investment planning implies an as much rational as possible distribution of the limited resources in investment possibilities, in accordance with their expected results. At first glance, such a definition seems simple, but in practice some problems occur, as given below:

- While planning the capital investments, it is not possible to predict all the investment possibilities to take place in future, which creates a problem of having to change the planning horizon and appearing of new investment possibilities
- The capital investment plan is usually adopted once a year, meaning that one has to take into consideration the real time shifts that can postpone or even cancel the investment
- The economic and financial criteria (profitability rate, for example) are approximative values and they are not, nor they can be the only basis for adopting the decision on the concrete investment. When making a decision, one needs to bear in mind the market conditions, competition, management capabilities, risk, organizational conditions etc.

Therefore, it is clear that there is a generally valid model, that is an automatism in selecting the adequate investment. It is important to define the procedure of adopting investment decisions and to provide analytical tools utilized in the process of investment planning. An efficient analysis of capital investments requires some fundamental rules that provide the meaning and consistency to the investment decision-making, and we can define them in the following way:

- Defining the problem
- Determining the characteristics of the investment
- Assessing of future costs and profits
- Planning of capital flows growth
- The relevance of accounting data
- Cost deposit
- Time preference of money

The methods of analysis that take into consideration the said elements, although not evenly, establish the relation between the fundamental components, such as: net investment, money flows, economic life and the final value present the basic measures of investment analysis, and for the purpose of this paper we will elaborate more in detail the following three:

- a) Pay-beck period
- b) Net present value
- c) Internal rate of return

**a) Return period.** This is a very practical rule that puts into interrelation the assumed annual money inflow rate of the investment project and the necessary net amount of the investment. The result shows us the number of years that is necessary for our initial investment to return. However, the return of the invested capital is not enough, since the investor wants to make a profit on the investment during the investment period. This problem can be illustrated by means of a simple example of an investment of 100.000 Croatian kunas and the annual business cash flow of 25.000 Croatian kunas , assuming that the investment earns an average return of 10% of invested resources per year. Investment depreciation is presented in the Table below:

Table 1 : Investment depreciation plan

	1	2	3	4
Year	Initial state	Profit with 10%	Business activity cash flow	Final state
1	100.000	10.000	-25.000	85.000
2	85.000	8.500	-25.000	68.500
3	68.500	6.850	-25.000	50.350
4	50.350	5.035	-25.000	30.385
5	30.385	3.039	-25.000	8.424
6	8.424	842	-25.000	- 15.734

Resource: Helfert, 1991., 195.

This simple example shows that the return period is 4 years, but with calculating the average profit on the invested resources of 10%, the depreciation is extended to 6 years, which is 2 years longer than the return period.

**b) Net present value.** Net present value of the investment presents the difference between the discounted future net cash flows of the investment and the initial investment. This measure indicates whether an investment brings the profit the rate of which is applied in the calculation. An important factor in this method of analysis and assessment is the discount rate, which represents the opportunity profit rate of an investment, and the norm which is commonly used is the total cost of capital of the company that comprises the business risk as well. This rate often reflects the goals of the management in achieving the bigger profitability than the minimum cost of capital.

Table 2: The analysis of the net present value with the 8% rate

	1	2	3	4	5
n	Investment	Benefits	Present value factor 8%	Present value	Cumulation of net present value
0	100.000		1,000	-100.000	-100.000
1		25.000	0,926	23.150	-76.850
2		25.000	0,857	21.450	-55.425
3		25.000	0,794	19.850	-35.575
4		25.000	0,735	18.375	-17.200
5		25.000	0,681	17.025	-175
6		25.000	0,630	15.750	15.600
$\Sigma$	<b>100.000</b>	<b>150.000</b>		<b>15.600</b>	

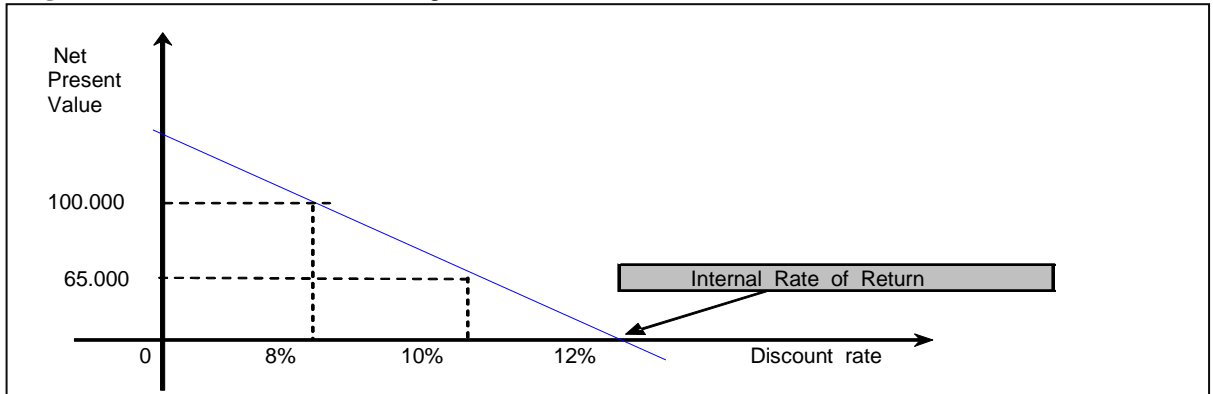
Resource: Helfert, 1991., 206.

The previous table shows that the investment worth 100.000 Croatian kunas, with six annual nominal inflows of 25.000 Croatian kunas each, assuming that the management of the company considers the 8% profit rate satisfactory, will result in a net present value of 15.600 Croatian kunas. The similarity of this method with the return period method is clearly visible, with a significant difference being that the net present value method contains in itself the required return rates. Therefore, the surplus presented by this method is an economic benefit that satisfies the set norms for profit.

**c) Internal rate of return.** This concept of analysis includes the real, i.e. maximum return that a specific investment makes. The internal rate of return is the average annual rate of obtaining interest on the invested sum within the investment effectuation period, assuming the profit is reinvested in the very investment project. The problem that arises when applying this method is how to determine the exact discount rate that satisfies the following requirement: Net present value

= 0. This problem can be solved in the simplest way by means of the approximative method of calculation of the veer value and its equating to zero, which is showed in the following diagram.

**Diagram 1:** An overview of determining the internal rate of return



Resource: I.Šperanda (calculations made by the Author)

This method is superior to the previous ones in ranking the investments, but it contains two significant problems. The first one occurs due to the mathematical probability stating that complex projects with substantially different cash inflows and outflows basically generate two different internal rates of return. This happens due to different models and time of occurrence of cash inflows and outflows and it poses a rather big problem during the analysis. The other problem, probably more significant than the first one, is the problem of the practical choice between the investments that have considerably different net investment expenditures and their internal rate of return is contrary to the size of the project. Namely, if the internal rate of return on the investment of 100.000 Croatian kunas amounts to 15%, and on the investment of 500.000 Croatian kunas it amounts to 12%, and if the rate of return required by the management amounts to 10%, then we face a dilemma whether to choose bigger absolute returns with a lower rate of return, or vice versa: to have smaller absolute returns with a higher internal rate of return.

#### 4. RISK MANAGEMENT IN A DYNAMIC ENVIRONMENT

We define the risk in general as a probability of damage (Hagstrom, 2008.,181.), loss or threat. To be under the risk means to be an entity subject to damage generated by a process or an activity, and the degree of risk presents the probability of occurrence of such a negative event.

Since we are interested in business risks in the area of investment, we speak of the financial risk of an investment. The financial risk of an investment presents the risk of failing to cover the fixed costs, that is it poses a doubt that the achieved financial result will not cover the interest rate on the liabilities of a company, i.e. it will not cover the basic fixed costs. Therefore, the risky investment points to the certainty of the absence of the Guarantee contribution 1., which is not acceptable (Luković-Lebefrom,2013.,208.) Certainly, the very occurrence of the financial risk creates an aversion towards the risk, since from the aspect of the investor, the increasing of risk has a diminishing utility. A number of issues arise here requiring an answer. Whether or not to get into an investment and take the risk is the central issue to which the investor requires a reply. This issue appertains to the area of the tasks of a controller, and therefore we will explain in what way we have obtained an answer to this issue.

Running a business in a turbulent environment imposes the acceptance of taking risk as a business fact. Each economic activity bears in itself a degree of risk, each business decision is risky, which means that the risk of business conditions is to be accepted. The very fact promotes the development of Risk Management and the existance of business operation at all levels. The success of Risk Management depends on a variety of factors, which are as follows:

- a) Predicting future risk – a quality prediction provides a possibility of preparation, selection of an adequate strategy for mitigating the impacts of the negative event, and the company thus acquires the competitive advantage.



- b) Identifying and analysing the quality of risk – the type of risk is to be clearly recognized, and the analysis is to be carried out in order to identify its structure.
- c) Risk quantification – determining the force of the negative event, as well as the area, which is a prerequisite for the preparing and selecting of activities designed to reduce it to an acceptable level.
- d) Risk response – if the three previous phases have been completed, the management can design adequate activities necessary to reduce the impact of the negative event to an acceptable level.
- e) Risk monitoring and control– the control and monitoring of risk leads to its gradual elimination, that is the resuming of a successful running of business despite the presence of a negative event.

By a timely knowledge of the forthcoming negative event, it is possible not only to prepare for minimizing the damage to the company, but to turn the situation to our advantage as well. For example, by means of a timely prediction of the crisis in the construction sector, for capable investors this can mean a good opportunity for development. In what way? The crisis in the construction sector, as seen from the aspect of the placement of buildings, such as apartments, is decreasing, as well as the price per square meter. The cost of labor is also decreasing, and in order to come out of the crisis, the previous construction cost calculation requires a reduction in the price of all the involved subcontractors. It also means that the one who has the money determines the price, which brings about significant savings. Therefore, it is beneficial to predict the crisis, wait for it, and when it comes start an investment. This is particularly true in the planning of new investments. Another case is when an adverse event has not been predicted on time, or the investment is underway, and therefore it is necessary to solve this problem. Therefore, the negative event, and the upcoming financial risks are related to the changes in market prices. In this very segment the classical doctrine of "pricing policy" in terms of growth and price reduction changes. Each change in the prices causes a war on the market in which many get hurt, that is the change in price under the influence of the global market is a sign of the beginning of a crisis. Yet, how should one decide on the investment under the current environment conditions?

## **5. RISK MANAGEMENT OR HAZARD?**

Each entry in a risky investment for which the incoming negative impact has not been assessed, is an unreasonable acceptance of risk that is a hazard. In which case we can say that it is reasonable to accept the risk and in which one that it is unreasonable? There are two basic levels of capital investment decision-making that need to be observed :a) National - commercial level, and b) Corporate – commercial level. Each of them is to be addressed. The national-commercial level of knowledge about the degree of risk is particularly present at the present time. However, regardless of the globalization, each investment is carried out within certain national terms and regulations that bear high risk. The national risk is recognized by the credit risk assessment agencies, which is a risk assessment of an investment. Investment risk presents trust in the environment where the investment is to be implemented. The question is how to solve this issue, and how to obtain trust from the potential investors. At the global level, the Thurow's Theory of Punctuated Equilibrium is confirmed, which means that we should expect a further development of economies in transition (Thurow, 1996th, 279) Many factors suggest that this is realistic to expect that, but the fact that there is a high degree of uncertainty at the national level repels potential investors. How can we solve it? Angela Merkel said: "Look at us, but do not copy us" (Fidler, 2012., 4) What does it mean? In this time of crisis Germany has showed the strength of its economy and of its economic and political system . The present strength of Germany's economy, as seen from the national-commercial aspect, lies in its establishing a system that gives the investor a high degree of security. It is a system that has managed to prevent corruption, protect creditors' legal rights, the system that is not familiar with the term "not settled claims", and most importantly, it protects the investment. There is a series of state laws that provide investors

with a refund in case the investment fails, and his investment is greater than 1 million EUR, or he participates in the investment with more than 5%. Many other laws, behavior patterns, compulsory control and monitoring of investments, as well as the obligation to organize a quality Risk Management, are unknown to the economies in transition. Standardization is also one of the forms of investor protection and obtaining a quality investment. Standards are established at all levels, such as international, continental, national, group level and company level, that give them market prestige. Germany has special laws and standards that determine Risk Management, as well as the operation conditions, procedures and organization, and control is implemented without exception. The same is with the USA, where the American companies have adopted safety standards for planning in Risk Management as ISP / IEC 27001:2005, which is the standard for the Security Information Management System (ISMS) (Encyclopedia of Management, 2009, 117) Standards implemented within an organization provide the organization with a competitive advantage. For example, Mercedes-Benz has its own quality standards that guarantee high quality brand cars to their customers. In support of Risk Management, we can say that all the companies in Germany, as well as their public administration have introduced both Risk Management and Controlling. Controlling contributes to the following: (1) forecasting of upcoming negative events, (2) scanning of the risk structure, (3) assessment of its impact, as well as of the areas of negative impact, and what is more important, it helps in decision-making and planning in risk conditions. At the same time, Controlling is developing new methods and tools designed to calculate the level of risk, and thus making decision-making a success, not a hazard. Those exact conditions of the activity of Controlling in the domain of Risk Management help the management in making sound decisions within the limits of acceptable risk, distinguishing it from the hazard. Therefore, the financial risk is a part of our everyday life and it is a factor of every decision made in the investment process. The question of how to treat and manage investments in time of crisis still remains unresolved. Firstly, after recognizing the emerging negative events and determining the risk structure, it is necessary to make an investment decision, and then to set up an investment plan with a clear objective.

## 6. INVESTMENT DECISION-MAKING IN A RISKY ENVIRONMENT

Besides the common standard deviation as a risk measure, we can also carry out the analysis of sensitivity that basically replies to the question: what if? Therefore, it states what will happen if some of the parameters change for specific values.

If we start with a simple definition:

$$R = \frac{((CxV) - T)}{I}$$

(2)

Where:

R=result of an undertaking

I=investment in the undertaking

V=volume of impacts of the undertaking

T=total costs of the undertaking

C=impact unit price

If for a given I value the other values are completely determined, i.e. each one has only one possible value and r, that is the final result of a business undertaking is completely determined. However, it is improbable, if not impossible for all the presented parameters to have only one

value. It is far more probable that each of the said values can be presented by means of probability distribution.

The said analysis of sensitivity is applied in case all the variables have more final values, i.e. this method is used in order to determine the degree of accuracy for each data with the aim of achieving the real optimum.

Let us assume that for a certain investment in an undertaking (I) there are „ $V_i$ “ probabilities of impact volumes, for „ $i$ “ of 1...n.

Each „ $V_i$ “ has one price distribution „ $C_{ij}$ “ which is related to them by „ $j$ “ of 1...m, and it has one total cost distribution „ $T_{ik}$ “ with „ $k$ “ of 1...p.

Each „ $V_i$ “ has one value „ $v_i$ “, and it is  $\sum_{i=1}^n V_i = 1$

(3) Each unit price „ $C_{ij}$ “ has the value „ $v_{ij}$ “, which

results in  $\sum_{j=1}^m C_{ij} = 1$  (4)

It is logical that each „ $T_{ik}$ “ has one value for „ $v_{ij}$ “ so that it is  $\sum_{k=1}^p T_{ik} = 1$

(5)

In this way we can calculate the pure result at each level of volume of impacts for any amount of cost and price that are related to that level of impacts, so that for a certain level of „ $i$ “ and „ $jik$ “ we have:

$$R_{ijk} = \frac{(V_i C_{ij})}{I}$$

(6)

The probability of „ $R_{ijk}$ “ is  $V_i P_{ij} C_{ijk}$ , so that out of all the possible results of an undertaking we can establish a single distribution and assess the probability of each result.

After analyzing of the concept of risk as a key element in planning and monitoring of investment projects, the fundamental methodological assumptions for the operational planning of investment projects can be established. Those assumptions are also the prerequisites that the methodology of such a planning needs to meet in order to enable a professional and adequate investment analysis. Drafting of analytical and synthetical studies within the comprehensive investment research requires a certain organization of work with the procedures explained, as well as with their sequencing and the subjects participating in the process. In order to enable an adequate implementation of organizing in the investment project planning process, that is in order for the sequence of procedures to be able to reflect the logic, principles and criteria of the planning, it is necessary to assign the experts within the workgroup who will draft the investment study. From the afore-mentioned, it is clear that the investment as an integral process of planning, implementation and control is seen as interdisciplinary, which presupposes teamwork. It is not possible to enumerate all the professionals and professional fields that should participate in the planning of an investment project, because it depends on the specific features of each individual investment undertaking. However, regardless of the specific features occurring in practice, the experience shows that in the process of planning and implementation of an investment undertaking there are often some issues that arise from the following areas of expertise, such as: social, technical, economic and legal area.

It needs to be emphasized that beside the above-mentioned issues, some issues from the other areas of expertise can arise, which shows that it is essential to involve the experts from those

areas, as well. Therefore, the specific features of each investment undertaking determine the selection and combination of experts engaged on the planning of an investment undertaking, and in this case only the interest of a proper planning can be applicable.

The investment planning is carried out for the purpose of a future undertaking, which shows that when budgeting one is to take into consideration the allocation of costs, i.e. the costs that an investment has incurred or not with regards to its regular business. Thereby, the phase of investment decision-making is essential. The role of a Controller in making an investment decision is major. His calculations offer answers to a range of questions that keep arising, and if we avoid them we are close to the decision-making under risk.

## 7. CONCLUSION

Today business decisions are made under conditions of uncertainty and high risk rate. Since these two concepts are often confused, it needs to be emphasized that risk is a state in which the possible outcomes of making a certain decision are known, and the probability of the event can be assessed. On the other hand, uncertainty is the state where as a result of a certain decision an entire array of various outcomes can occur, and the probability of which is completely unknown. Therefore, we can say that the uncertainty is rather a subjective phenomenon, while the risk is an objective phenomenon that assumes a relevant knowledge of the alternatives.

Thus, it is essential to determine the level of risk that, as a measurable and manageable category a business decision, that is an investment decision will fail to achieve the expected return/profit. In the same way we can consider the planning of an investment as an important part of the business process and an essential part of the management process within an organization. In order to achieve an adequate planning it is important to have as much trustworthy and quality input data as possible. With respect to its character and consequences, the investment planning process, i.e. the drafting of investment studies and assessment of a specific investment is so wide and comprehensive that it is necessarily interdisciplinary, and it relies on the Controlling function of each organization.

A detailed, realistic and professional investment planning and its continuous control and improvement reduce business risks significantly, but unfortunately they cannot remove them completely.

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