

AN INNOVATIVE PERSPECTIVE ON FINANCIAL DECISION-MAKING

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Abstract: *This paper presents a multidisciplinary research that brings together areas such as finance, behavioral economics, fractal theory and management. Each of them presents a specific methodology for quantifying and measuring the analyzed phenomena. The present paper uses the multidisciplinary approach to the results of applying specific methods in areas such as psychology or exact sciences in the field of managerial finance, areas that apparently have nothing to do with each other. The results obtained from this approach highlight new knowledge, approached from a different perspective. The development of managerial finance science, a field of high interest at the moment at the level of companies, is at the heart of its financial decision-making. The paper analyzes the financing decision of enterprises both from the perspective of listed companies on the capital market as well as of the non-listed companies, and the scientific relevance of this research lies in the various conceptual clarifications presented. The degree of novelty brought by this research is supported by the innovative approach of the financing decision by addressing some elements of fractal theory, behavioral finance and managerial finances. At the same time, the paper highlights the theoretical and practical aspects of innovations in financial decision making. The impact of research results lies in the ability of the models approached to be used by any manager of a company in taking a financing decision in the context of efficient and innovative quantification of risks and performance. The risk associated with a particular form of financing is analyzed and quantified according to the specificity of the selected form of financing. This paper analyzes the defining characteristics of the risks associated with the financing decision taken by the managers of projects inside companies, taking into account the objective characteristics but also the subjective ones. This paper analyzes the innovative elements brought by the modern theories like behavioral finance, game theory, mechanism design-theory, managerial finance and others that have an impact on the financial decision process both at the enterprise level and from the perspective of the decision-making subject.*

Keywords: *behavioral finance; expected value; fractals; project financing; decision model.*

JEL Classification: *G41; G32.*

1. Introduction

Financial science has undergone structural change along its crystallization process. In the classical vision economy was "driven" by an abstract force, the "invisible hand" as Adam Smith stated in his *Wealth of Nations* (1776) which was intended to "distribute limited resources to unlimited needs." Evolution of scientific research has

highlighted the fact that economy can become a battlefield in which various players share their resources. This latter view of the economy offers a much more realistic and humane picture in contrast to the traditional one. Today the economy is viewed both at macro and micro levels up to the individual one that of the economic agent whose role as "player" is defined by the effects of its decisions on the other "players". Current state of knowledge in the field of financial decision-making should begin on the origins, where the classical finances are characterized by the premises of strict rationality in the decision-making process. Over time, emergence of modern finances has been closely linked to the shift in research focus on factors such as human perception and personal expectations of the individual involved in financial decision. These elements, once taken into account, reveal the unpredictable nature of human nature and therefore of the effects resulting from the financial decisions taken by the individuals.

Modern finances analyze and define concepts such as uncertainty, coming from this subjective nature, in economic transactions and the associated risk. Subjective elements in defining risk come from the human perception of decision maker. The expected value, that is the one estimated by the subject prior to any financial decision and the market value of any financial decision taken is almost the same according to classical financial theory and this financial equilibrium situation describes the characteristics of the efficient financial market. Identifying the difference in the economic market between the market price and the "expected" value is the subject of modern finance research.

Why is this difference between the market price and the intrinsic value of a financial asset? Trying to find the right answer, this paper analyzes numerous theories and studies in order to find a suitable model in this regard. In order to accomplish this goal, this paper presents how the subjects of financial decisions integrate risk in achieving the "expected" return as high as possible. Utility is another concept used in economics to characterize human decision making. This is a trigger for the financial decision. The notion of "expected utility" thus captures the subjective factor of the financial decision. The existence of value differences between the various decision alternatives is in fact the "stimulus" triggering the decision-making mechanism at the level of the economic agent. That alternative that gives the decision maker the "expected marginal utility" is preferred by "homo oeconomicus." The fundamental hypothesis of classical finance is that of "homo oeconomicus", characterized by rational behavior, oriented to maximizing its usefulness. People make decisions depending on the context and on the basis of marginal values perceived by the subject by comparison (Tversky A. & Kahneman D., 1974). Differences in value perceived at the psychological level cause people to act. Value is not mobilizing unless it produces satisfaction for the subject (McFadden, 2000). These premises described above characterize the notion of economic value or profitability as it is used in economic theory.

Modern financial theories like portfolio theory developed by Markowitz (1952) are built on models for estimating the cost of capital (Sharpe 1964, Jensen & Meckling, 1976; Fama & French, 1993; Estrada 2000), agency theory, mechanism design theory, prospects theory or game theory bring into question factors that affect human decision-making. This paper analyzes the innovative elements brought into question

by the modern theories which have an impact on the financial decision process both at the level of an enterprise and from the perspective of the decision-making subject.

2. Research methodology

This paper's research objectives refer to identification of those characteristics which are specific to decisional mechanism by analyzing the subjective factors, human factors of the subject involved in a profitable and risk - bearing activity, as well as of the objective ones. This research relevance lies in analyzing the relevant factors to the financial decision making mechanism in projects managed by enterprises bearing risk and uncertainty. Individual's decisions shape and structure current economy. It is impossible to separate the notion of "decision" from "economy" from the objective of understanding risk phenomenon accompanying decisions taken at both individual and project or organizational level. In another sense, investors or decision - makers in the economy are primarily humans and risks that are related to financial decisions are due to their unpredictable nature and will be analyzed during this work.

Research methodology used is direct observation and critical thinking and reasoning made to reveal similar or different aspects of the studied notions, as well as describing dominant characteristics with an impact on the research topic addressed. Economic analysis can be split into positive and normative analysis, depending on the purpose and method used. The first type of analysis refers to studying economic phenomena to discover the functioning of mechanisms and processes, to describe phenomena and to reveal new meanings. The second form of analysis relates to the use of the first method to substantiate the results or conclusions of value judgment on certain directions to be followed. The research method used refers to the use of positive analysis to understand and explain economic phenomena by presenting possible alternatives and assessing the advantages and costs involved in various alternatives implied by financial decision-making.

3. The issue of optimal allocation of resources in financial theory

3.1. In search of an epistemological reference model used in research

The attempt to find the perfect model that can accurately predict "who, what, and how" is an attempt that failed, at its beginnings. The studies made so far on the subject showed that models will predict the future in a more "predictable" way than the analyzed phenomena does in reality. Until now, no expert has been able to predict exactly what will happen in the medium and long term. In the short term, however, it is viable to use economic models to make predictions. Why? The aim of this paper is to reveal the optimal model that is able to take into account the degree of uncertainty specific to the real world and thus contribute to the clarification of the analyzed aspects, offering alternative solutions to the studied issues.

Financial theory is in a constant search for models from which society can benefit for a better life adapted to the new environmental challenges. Methods and technologies are sought to enhance the quality standards of human life both in urban and rural areas. The classical theory of economy uses notions such as the market with perfect

competition as a theoretical model, as well as the particular case of imperfect competition through monopoly or oligopoly (Romer, 1996). The market, in the classical view, appears at a macroeconomic level as being made up of similar economic actors, without taking into account their individual characteristics. The microeconomic approach views the individual behavior of an economic actor on the market in terms of transactions with other economic actors, but without taking into account their individual characteristics or mandate or representation relations between them (Samuels et al., 2003).

Analysis of the balance between supply and demand was the primary focus of economic research over the centuries. It starts with the analysis of the market equilibrium mechanism through price which is still the subject of the macroeconomic analysis and goes beyond the analysis of the agents' behavior allocation on limited resources to the level of the individual as a functional morphological unit of demand and supply. Economic research focuses on the analysis of human behavior and, in particular, how people make decisions in response to environmental stimuli. We recall in this sense the pioneering efforts of Herbert Simon (1978) in analyzing the decisional behavior of individuals at the level of an economic organization. Hayek (1945) is one of the first scientists to demonstrate the primary role of information in the decision-making process to optimally allocate public financial resources to private enterprises. It was therefore justified to develop a new model for resource allocation in an economy where price mechanism is not an effective allocation tool just by the means of using information taken from the actors of the market but who are willing to make it public with the right incentives. An alternative to the "invisible hand" of the classical economic model developed by Adam Smith (Smith, 1776) was needed. The classical model described the market with perfect competition as being characterized by a large number of participants from both the demand and supply side, presenting homogeneous characteristics so that the price of equilibrium was given by "meeting" between supply and demand on the market, without any intervention from outside. But since then, over more than 300 years, the structure of markets has changed dramatically so the mathematical model developed by Hurwicz - Maskin - Myerson (2007) provided a better model to describe the mechanism for allocating resources, describing in a more realistic manner the current markets allocation mechanism.

What is financial decision-making and how it works is one of the questions that arise in the mind of any researcher in this field. Finance as a science is in a constant state of redefining its models and methods to help deciphering mysteries hanging over this area. Each science has its specificity, all have evolved over time and each one enriched its area of knowledge by working with other sciences. All have borrowed methods and techniques from each other in order to gain a deeper understanding of the phenomena that take place in the world around us. So new independent sciences appeared by merging one to another and an important number of "border" sciences have been born such as behavioral finance, game-theory, econophysics or others.

Another milestone for economic and financial theory were the 1800s, when researchers and scientists have turned their attention to issues regarding the study of national income produced by a country's economy developing models of

macroeconomic analysis like the price of supply-demand balance on the perfectly competitive and free market. The variables analyzed were quantifiable and related to linear functions that measured market demand and supply at economic aggregate level (Greene, 2003). The equilibrium price was created on the free market and was the one at which the supply of goods and services between supply and demand was made without the need for economic arbitrage measures (Dixit, 1990).

This is also the prospect of Adam Smith's classical theory. The balancing mechanism on this market was "naturally" realized by the "invisible hand". The problem that researchers were looking for a solution was referring to efficient allocation of natural resources that are limited. At that stage, however, the issue of arbitrage of resources between the market players was not discussed in the sense of their reallocation between them. The free and competitive market, which is the classical model of allocation resources through the "invisible hand" is a mechanism that efficiently allocates resources under perfect competition conditions and this affirmation applies to privately owned assets (Varian, 1992). But in the case of the public, the model of resource allocation described by the free market does not work. This justifies State's intervention to allocate resources to the free market for the purpose of regulating and delivering public goods. At the same time, the state acts on the market as a true economic actor, providing increased access to finance for private businesses, taking direct action by providing subsidies or money loans. The State also supports enterprises by financing investment or public utility services offered to private actors. The term public goods shall be used as a concept referring to public goods and services. To this end, the state intervenes in the free market by allocating a share of the public financial resources at its disposal to private enterprises to provide them with access to the necessary funding sources. At present, the state plays an important role in ensuring access to finance for private enterprises through the use of various flexible public - private financial tools. This form of access to public - private funding can only be materialized through the realization of projects in partnership between the state and enterprises, which share both human, material and financial resources.

The country's macroeconomic policies, starting from the crisis of the 1930s to the 1970s, were influenced by Keynes's ideas and addressed demand fluctuations, in the sense of stimulating it in times of recession by "printing and injecting" money into the economy translating into market demand and stimulate production in this way (Elvin, 2004). The rationale was well received by the governments of the states that have begun to practice large-scale excessive budget deficits from that date. Analysts were interested in measuring aggregate phenomena in the economy by the year 1970. With the work of Robert Lucas, scientist's interests turned at the microeconomic level. His ideas attracted the attention of scientists towards the fact that implementation of public policies translate into a number of decisions taken by people. Thus, the importance of decision-making at the enterprise level and the solution brought by project management for the achievement of organizational objectives appeared. The pioneering work of Robert Lucas the 1970s meant the introduction of micro-economic elements in the macroeconomic models and the unexpected influence people can have on macroeconomic variables. All in all,

economy and society is composed of individuals whose decisions influence the course of economic aggregates.

3.2. Behavioral elements in the modern financial decision-making model

"Homo oeconomicus" definition lies in its involvement in transactions having a purpose in mind and bearing at its disposal of a number of "tools" for achieving it. He is "limited" by "inputs" or by his resources and he is oriented towards "outcomes" to reach the proposed goal. In this sense, any human activity can be defined as a process- input and output - and a series of coordinated unique processes to a particular purpose results in a project. Economy as a whole is the sum of the results of all individual projects so that economy appears as a portfolio of projects.

Current context in which organizations operate involves a large number of forces, each of which has its own specific interest. We refer here to the forces of the external environment, such as the market, customers, suppliers, investors, business partners and also to the internal environment of the company's management and employees. All these stakeholders want to get some value for the resources invested within the organization. But this value has a different content for each of them and takes the form of divergent interests. Depending on how the organization will be able to coordinate all these divergent forces in order to achieve its purpose depends on its success in the market thus gaining a comparative advantage over competitors. This comparative advantage actually translates into that added value for all stakeholders in the organization. The way managers strive to find the most appropriate solutions to the ever-diversified requirements of customers, suppliers or investors that will decide its survival on the market.

The question that both managers and financial science have tried to answer is "How do we add value?" Scientific research and also managers in the business tried to find answers to this question by turning their attention to the study of economic reality in order to exploit domestic resources for the benefit of the organization in order to create added value for those who bear an interest in that organization.

According to microeconomic theory, the balance in a market with imperfect competition and in which information is distributed asymmetrically among the participants is achieved by the "chance" encounter between demand and supply on the market. But the "invisible hand" or the "incidental" equilibrium effect on the market is not an efficient mechanism in allocating limited market resources so that to minimizing losses, nor maximizing earnings due to the reality of markets characterized by the presence of asymmetric information distributed among the participants and by imperfect competition.

The economy as a whole is a sum of individuals interacting bearing different interests. This interaction is an exchange of a material or immaterial nature. The exchange between individuals is generated by the purposes or interests of the people, who thus enter into relationships with each other. Transactions between people in the economy are financially supported. This creates an intrinsic link between the notions of project financing and the objectives followed. The project determines how divergent forces between individuals are convergent directed, in that they share a common and unanimously accepted goal. Even though the directions in which the forces are directed are found in different planes and angles, their result

will come in one single point. Enterprises create both the environment and the factor for change and progress of the human being. The "internal kitchen" of each organization creates prerequisites for innovation but also the ways in which they come in to influence in an increasingly deeper manner the lives of individuals.

Organization is an environment for the transmission of information in order to guide the work of people to achieve the goals for which it exists and has been created. At the same time, the organization is also a means by which managers carry out their goals, whether private or public. Private-public differentiation departs from the characteristics of the interests or mobiles that stand behind these goals. They can belong to a single person or group acting in their own name, and then the organizations are privately owned. Among the theorists of this vision of organizations, viewed as economic entities oriented towards the achievement of goals, one can mention the contribution of Friedrich von Hayek (1974). His ideas were continued by Professors Leonid Hurwicz, Eric Maskin and Roger Myerson (2007) who built a model entitled mechanism design theory and it is a decision model. The theory that lies behind the model refers to the fact that it was necessary to develop a mechanism that would support organizational decision-making in order to optimally allocate the value added expected by the participants. Professor Maskin explains that the essence of the developed mechanism starts from the goals and interests of the participants who interact and has discovered the "revealing principle" that describes all the possible solutions that represent the balance of repetitive games, coordinated by an external mediator. Professor Myerson explains why resource allocation is no longer a current theory, and taking Hayek's theory (1945) and developing it has shown how individual ownership of private information can create hidden motivations for participants or agents to send false messages to partners to manipulate the results of the transactions between them. Thus, their mechanism integrates the notions of moral hazard and adverse selection (Myerson, 2007). Bringing together elements from game theory they have built a decisional model describing the mechanism of optimal allocation of the surplus value resulting from the transactions between them. The mechanism is built on a non-cooperative gaming system where participants have incomplete information about each other and the equilibrium is repetitively achieved. The model is currently widely used in auctioning, political choices, or paying taxes or duties in public and private organizations. The mechanism of this model refers to the realization of the best possible variant, from the one existing at the moment of taking a collective decision, which implies the simultaneous satisfaction of a large number of individual needs. The model uses mathematical elements and game theory to match the resources with the recipients they will be assigned, whether public or private. The goal is to minimize "loss of value" and to help maximize the partners involved in a transaction on a market where private information is heterogeneous and asymmetric distributed between participants.

3.3. Economy and enterprise seen as a portfolio of projects

The external environment plays a fundamental role in the dynamics of the organization, influencing its shape and nature. How does this explain? First in that all input - sites used by organizations come from the environment (raw materials,

energy, labor, equipment, etc.), then output - the organization appears on a given market that is also a part of the environment. Also, many aspects of the process of transformation of inputs into outputs are constrained or regulated to environmental factors (legal or administrative regulations).

A project implemented by an enterprise that pursues its goals in this way plays the role of agent through the project manager. The agent theory tells us that there is a series of temporal conflicts between the agent and the owner of the enterprise on behalf of which the action takes place between the short-term goals of people due to their human and long-term nature of the organization they belong to (Kahneman & Tversky, 1974).

Herbert Simon, Nobel Laureate for Economics in 1978, said that the organization was not an "individual entity," but a sum of divergent "forces" deriving from the different interests of the groups within it. Finding the "middle line" between the multitudes of objectives does not have a single "optimal" path of realization, but diversity (H. Simon, 1978). Daniel Kahneman reflects on the differences in time perspective of the managers, at the organizational level, between long-term and short-term objectives. Managers make decisions on behalf of the company they run (Kahneman, 2009). Robert Aumann discovered that at the individual decision-making level there is a disconnection between the clear and logical rules they establish before acting on and the irrational state of mind they find themselves when acting (Aumann, 2004).

At the same time, the goal pursued by an organization that can be defined as the goal of an individual or a group of individuals. It can be seen the interconnection of concepts such as individual, goal and project. The organization of human activity generally has a complex structure, that resembles the "Sierpinski triangle" a geometric figure present in fractal theory. This is a geometric shape that has a fractal structure, because the closer you look at it, you notice the identical "copies" of all that are actually its components, only their size is the only difference. The closer you look at the fractal figure, you can see in the composition of the object an infinity of copies identical to the whole in terms of structure but different in size. Similarly structured looks and the enterprise from the point of view of the organization of human activity aimed at achieving a goal. The company consists of projects that match the objectives of human activity, as well as individuals interconnected to each other through - a network of projects. Economy and the financial market is a network of structured projects for a specific purpose. One can thus talk about a country's economy as a complex project. Its subcomponents are the projects of the administrative - territorial units subdivided into the projects of the various organizations that make up the local community. Continuing with this reasoning, each individual's projects are reached. All projects that make up the economy are interconnected and look like a network of fractal nature. The fractal structure of the economy finds various applications, ranging from the social sphere, to the public finance system, to the private financial system.

4. Conclusions

Why are the subjects and the enterprise at the heart of this paper? The answer is simple: individuals are the ones who decide at organizational level and thereby they assume financial risks that impact their decisions. Financing decision on allocating resources on enterprise level depends on factors such as risk and return of a financial decision outcome. The incidence of risk associated with the financing of project management inside companies is an innovative approach to measuring risk as it analyzes the impact factors on the decision-making subject both globally, at macroeconomic and microeconomic level and at enterprise or project level to the decision-making subject. Current research also provides a theoretical contribution to knowledge and understanding of the financing mechanism of projects managed by enterprises revealing modern financing decision models that built on classical financing sources to more complex ones from the capital market.

The financing of a private enterprise, irrespective of the number of its owners or shareholders or its turnover, is analyzed as an integrated concept in the financial market. The concept of financial market, in the present study, refers to all the sources of funding that are currently available to organizations. Market sources of funding in the current context are either private, governmental, public or both. This integrated approach is necessary because money flows are moving in and from public to private and vice versa. The overall outlook on the entire financial market can provide a better understanding of the phenomenon of money multiplier in the economy and also on the financial mechanism needed to secure the money resources necessary to achieve the organizational objectives using the different forms of financing existing on the market. All these phenomena are conditioned by the evolution of the political and legal environment, all of them being approached in a complex integrated structure of projects, objectives and resources needed. Studying the mechanism of financing an enterprise's objectives through projects is the motivation of the present paper and involves reflections on the different patterns of resource allocation in the economy during the stages of economic theory, from classical to modern.

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