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A SYSTEMS METHODOLOGY TO SOLVE ECONOMICAL-FINANCIAL PROBLEMS (SMEFP)

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Abstract. *As a result of a global economic system, financial markets impact to society throughout the world; therefore, it is necessary to face the new global financial market and to understand global future and sustainable development with a holistic viewpoint; it mixes hard and soft approaches for tackling problems of real-world systems. A general financial economical system includes many factors: goods and services, input costs, profit or loss, international trade (import and export), industrial productivity, output quantities, pricing level, employment rate, capital expenditure and financial market, wealth, expectation, consumption pattern, among others. In this system, both, corporate and public sectors are linked by financial markets to make fund flow from public to business. Financial markets are complex systems which have been analyzed under a hard system thinking; from a holistic view, it can be said that there are many critical issues unsolved in today's world; thus, it is necessary to develop and/or apply models where a whole system is considered by including all types of relationships among all participants. As a starting point of a new dimension of holistic thinking, to understand the dynamics of global financial market as well as its role in an economic system and to find new ways for analyzing them, it is proposed a system view to set the basis to identify and examine the dynamics of global financial and economical markets system and their relationships under a holistic, complex and soft view by introducing a new proposed methodology elaborated from Soft Systems Methodology. It is supposed this new methodology will analyze market systems and also general financial systems.*
Keywords: Economical system, Financial markets, Holistic, Systems

1. **Introduction.** A system designates every collection of independent and interrelated elements forming a complex whole in order to achieve a common purpose. This system includes the relations among its

elements and characteristics that bond them within the collection, in this way, the system's properties can be described as a whole and also its comprehension is possible when studying them in a holistic approach, so that, the relativities are its relations and the groups that emerge from them [1].

A subsystem (microsystem) is a small system within the big system. It has its own purpose and contributes to the purpose of the system. It has its own parts and components which are determined by the overall purpose of the system for which it is a part.

A suprasystem is a system that includes both the system and its subsystem, such as the political system, educational system, cultural system and economical system. A macrosystem is the largest system that includes all of them. The elements of a system work as a whole in an integrated or interrelated manner. When it is analyzed a specific system, it has to be considered System Boundaries, which determine what is to be included or excluded from the system. Any kind of system is always situated in an environment; when talking about companies, this is what surrounds the organization which includes the social, political, and economical factors that impinge on the organization.

Many organizations attempt to implement solutions such as software development, statistical analysis, mathematical optimization, among others, which are used hard or closed systems methodologies which the human factor is hardly referred to as an important agent, since one of the major barriers in the solution of a problem is the aversion to change that occurs in the individual. On the other hand, it is also regular to implement solutions without previous studies and without the application of any methodology causing greater uncertainty in the effectiveness of the solution and the costs [2]. Some other approaches in the systems research area are also proposed [3].

The general frame which develops an economical activity of a country constitutes its economical system, which is defined as "the collection of principles, institutions and regulations that lead the character of the economical organization in a particular society". From here it is followed that within the economical system there are interrelated the economical activity, the goods and services production and the distribution among its members; this system requires the acceptation of a collection of principles and the acceptation and adoption of a series of basic decisions; these include the definition of the rights to different agents above the things and the mechanisms to be considered adequated to assign the sources, the distribution of produced objects among the ones that participate in the productive process, or, without exhausting the relation, to whom corresponds the responsibility to tackle and solve the economical problems of the country or the supply of specific goods [4,5].

A healthy economic system depends on the efficient transfer of financial sources among the savers, investors, and people, companies or government that need money to promote the production and consumption. The majority of those transactions are done through financial institutions such as banks (commercial, investment, and develop), insurance companies, investment funds, finance companies or savings bank that work as intermediaries among users and suppliers of economic resources that integrate the financial system. The financial system is a dynamic complex system in a constantly evolution that covers generated financial instruments, markets where they develop and perform, intermediaries, financial companies and other institutions (such as monetary and financial authorities, regulatory institutions) whose purpose is to carry out financial decisions about people, companies or government in order to ease the emission and transaction of financial instruments.

The current economical financial system has a global reaching due to the markets and intermediaries are connected through a vast international communication net, and in such a form that the transfer payments and securities trading can be done in a continuously way. In this system funds flow from the agents that have a surplus or redundant of cash to the ones with a deficit, and the most of the times the cash flows occur through the financial intermediaries [4,5]. Table 1 illustrates the areas covered economics and finance and some of the most common problems that occur in these areas.

Researchers from different disciplines have been interested in marketing, entrepreneurship and the interface between them. These researchers have come with variety background information, such as business, economy, psychology and sociology, providing a

TABLE 1. Economics and finance

	Economy	Finance
Definition	Social science that studies the management of goods and services, including its production and consumption.	Science of managing assets taking into account the time and the potential for risk and return.
Areas	Macro and micro.	Corporate finance, personal finance and public finance.
Professionals	Economists can be hired as consultants or to advise the public or private sector.	Finances are managed by individuals in their families, businesses and banks and other financial institutions.
Approach	Focus on broader issues.	Focus on specific issues.
Study	The production, distribution and consumption of goods and services in a society.	The flow of money from individuals, corporations or states.
Tools	Methods used to calculate the value or interest of the different products on the market.	Those used to protect and secure the future capital.
Common problems	Financial resources limited High level of indebtedness Excessive PDL Increases in cost of raw material Low-level sales Lack of capital to invest Difficulty to acquire loans Lack of working capital Lack of financial control Lack of appropriate personnel No uniform accounting methods Incorrect accounting Errors in the budget Fraud Strategic plan Solvency Unemployment Lack of investment Inflation Lack of competition	Goods and services produced. Level of employment. Productive resources. Price behavior. Establish criteria and policy recommendations for positive effects on fiscal and monetary policies. To study the evolution of the price level and its factors. Study the rules on how a country is linked with others. To stabilize prices within a system of free. Achieve a level of full employment for the population. Analyze the mechanisms that establish prices for goods and services. Effect of different institutions variables. Market prices. Quantities traded. Benefits of businesses and consumers.

range of different research techniques which are similar among them and applied to the context of the interface. It has, without a doubt, expanded the investigation's nature at the field. Different methodologies have been adapted to fit the companies' nature and used in market research and their relation with the business activity [6].

It is difficult to identify the best method for a given problem; this may depend on the nature of the non-linearity, system's size, if the amount of control used or the time required for the method is important, and some other factors [7]. The economical-financial system is a complex system that has been analyzed under a hard system approach, however, due to the global character of the economical-financial system and social, economical and political decisions that are taken on the subject, it is necessary to study it, and as much

as possible, to model it by using soft system methodologies that allow to characterize the way its interacting elements are producing its global dynamic.

Since it is critical to find all actors involved in earlier phases to know the problem and its context, before using or developing a rigid methodology that generates data and information necessary to support in the decision-making of the human factor, in this paper, it is proposed a methodology to set and analyze different economical-financial problems under a soft systemic approach that helps to take better risk decisions in a holistic integrated form (Figure 1).

2. **Problem Statement and Preliminaries.** Although the methodology of economical-financial system was created from some stages of Checkland's Soft Systems Methodology (SSM) [8], it is difficult to consider it as a metamethodology, because the way it is proposed the implementation of the stages differs from the way Checkland mentions them. A metamethodology must combine ideas and procedures from a family of methodologies [9].

2.1. **Part 1. Epistemological thinking.** Epistemology is the discipline that studies knowledge's nature, its possibility, its essence and its origin. Epistemology considers three elements taking part of knowledge's process: cognitive subject, cognitive object and the image or mental representation of the cognitive object that emerges in the human being by means of functions and intellectual operations, so that abstraction, conceptualization, developing proposals, among others [10].

Scientific thinking came up from the human necessity to explain every natural phenomenon which was attributed to magic powers, at the same time, it came up from the Aristotelian theology, that refers that the whole is greater than the sum of its parts. Since Descartes, scientific method had progressed under two related assumptions: a system could be broken down into its individual components so that each component could be analyzed as an independent entity, and the components could be added in a linear way to describe the totality of the system [12]. Von Bertalanffy proposed that both assumptions were wrong; on the contrary, a system is characterized by the interactions of its components and the nonlinearity of those interactions.

Systems theory is a transdisciplinary study of systems, which integrates natural and social sciences that covers living and nonliving systems through isomorphism principles, leaving intact the inner interactions, studying the system as a whole and covering its complexity [13]. Systems' view was based on two fundamental ideas: first, all phenomena can be viewed as a web of interrelations among its elements. Second, all systems, whether electrical, biological, economical or social, have common patterns, behaviors, and properties that can be understood and used to develop greater insight into the behavior of complex phenomena and to move closer toward a unity of science. System philosophy, methodology and application are complementary to this science (Laszlo 1974 [11]). In systems science the term methodology means the creative approximation to understand the phenomena of reality [14]. Methodology sets the models, strategies, methods and tools that systems theory and philosophy use in order to set the basis of studying systems.

There have been developed several systemic methodologies, and the most of them are from qualitative models where fundamental importance is data interpretation under a hard system approach. However, when systems talk about people it is necessary to study them under soft methodologies.

STAGE 1: PROBLEM. A diverse number of methodologies have been submitted for supporting decision-making within organizations, trying to standardize and integrate data from organizations to exploit in a simple way, detail its representation and extract relevant knowledge. Nevertheless, if the appropriated tools are applied incorrectly, the

process to extract fundamental data is poor causing the entire system fails in its objective to provide a correct solution [15]. Consequently, it is important to identify financial problems generated in organizations, governmental institutions and private companies.

It is possible to consider that there is a financial problem when there are money loses due to different situations. This causes the necessity to develop tools to take decisions

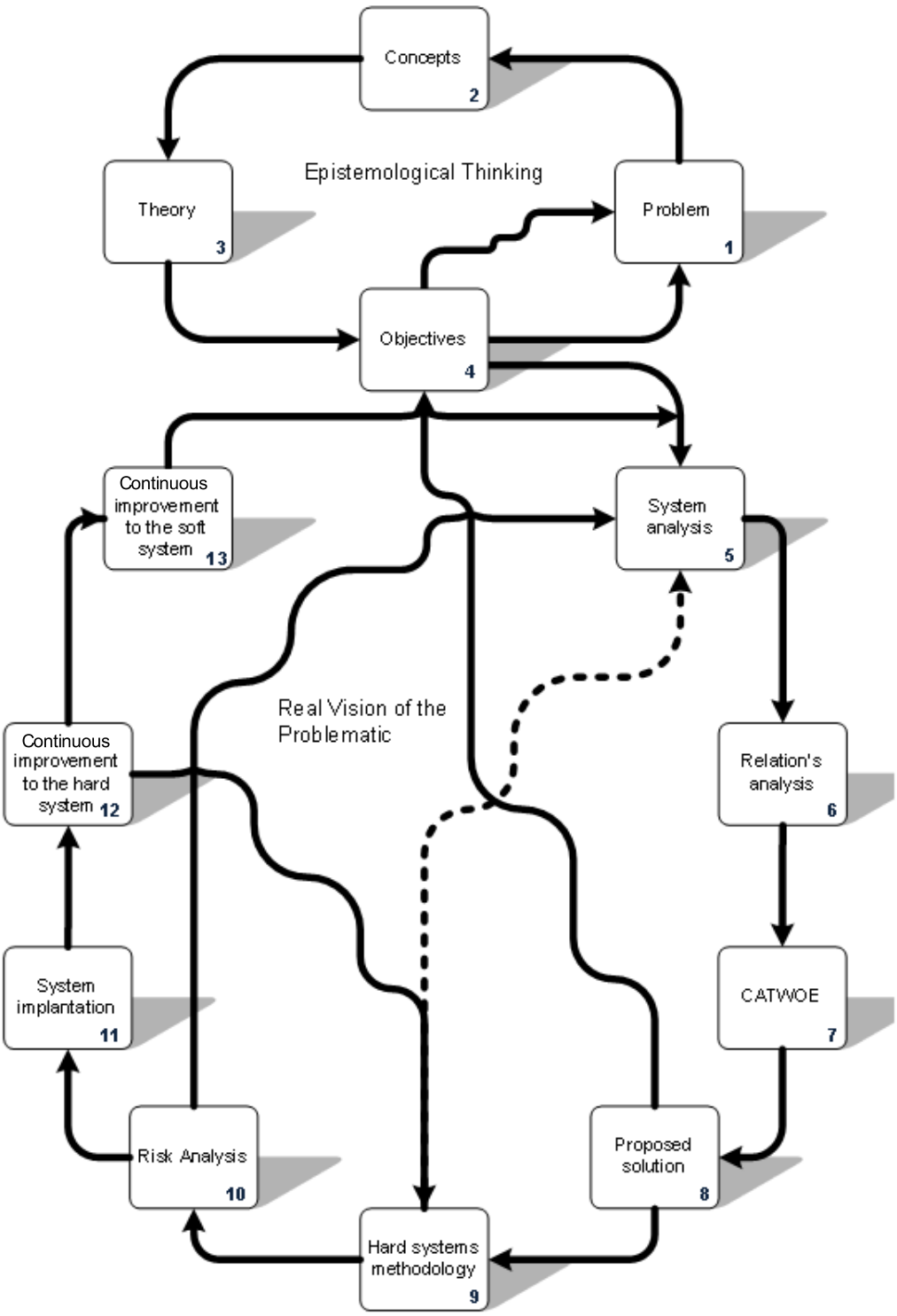


FIGURE 1. Systems methodology to solve economical-financial problems
Source: Compiled by authors

or to generate measures that contribute to solve the problem. However, frequently, the origin and the solution of the problem is not necessary where it is causing conflict. Due to this reason, the first stage of this methodology is to begin with a general analysis about what and why it is happening, locating the environment, the existing necessities, what is causing the problem and the difficulties belonging to the problem under study. It is important to mention that in this stage the expert's subject opinion is fundamental to understand the environment where the problematic situation is generated.

From these circumstances there are some questions that must be answered to identify clearly the problematic situation and afterwards to give it a good solution in next stages. Some of the key questions presented are:
Which is the problem to solve?
Where the biggest impact is presenting?
How this problem was originated?
What is causing this problem?
Who are the ones involved in this problem?

STAGE 2: CONCEPTS. Due to the proposed analysis under a systemic view, the concepts of systems theory must be used, just as the involved words in the system under study, to establish meanings and ideas in order to integrate new knowledge and experience with the previous one, it means, all the involved concepts are defined in the problematic, including necessary ideas to understand the situation and its solution which does not have a special name in the first language. Data are required to provide information about the system's operation, besides to forecast the environment in which the systems would operate in the future.

The necessary questions in this stage are:
Which are the essential concepts to analyze and to give solution to the problematic situation?
Is it necessary to create a new concept to satisfy a purpose?

STAGE 3: THEORY. As the second stage, systems theory is established as requisite to analyze the problematic situation. Afterwards, it is specified the subject of knowledge or application field that problematic situation is referred to, defining the important and necessary theories to proceed to the solution in next stages, deducing and stipulating other facts by means of rules and arguments form the basis to analyze the system and the solution.

The required questions in this case are:
In which theories are the concepts involved?
Which is the definition of the involved theories?
Which is the objective to use these involved theories?

STAGE 4: OBJECTIVES. After identifying the problem, there are set the characteristics of the environment within the system must operate and identify the necessities to be covered to proceed with the solution.

In the most cases, the objectives of a system present several conflicts, so it is recommend making a list of necessities of involved people or situations of the problem and, based on them to set the objectives.

There are several methodologies to set objectives; they can be used in this stage. If a specific methodology is unaviable, the proposed questions to set particular objectives are:
What is going to be done to solve the problematic situation?
How is the system solution going to be done?

What for is the system solution going to be done?
How long is the system solution going to take?

Based on the particular objectives it is essential to formulate a clear, real and specific general objective. The most accurate objectives are the easiest that would define a measure or indicator of the systems solution performance.

In this stage there is a feedback to the first one due to the most cases some considered necessities cannot be covered with the problem solution or emerge new necessities that were unconsidered.

2.2. **Part 2. Real vision of the problematic situation.** Business Economical and Strategic Direction requires research methodologies to analyze the complexity generated by the business phenomena. It is therefore essential the combination of different nature information: qualitative and quantitative, subjective and objective, both internal and external to the own studied phenomenon [16]. Throughout the second part of the methodology, it is proposed a qualitative analysis of the environment in which is presenting the problem and the involved actors, and then perform an analysis and quantitative development that generate fit results to solve the raised problems.

STAGE 5: SYSTEM ANALYSIS. Due to the structure of the financial systems, the problem is related with human activity causing untidy systems, so that, it is important to set the system with all its components: agents, subsystem, environment, suprasystem and macrosystem.

Step 1. People, institutions and other factors taking part of the problem must be set as involved agents. It is recommendable to make a chart to define all the agents by icons to represent them with its corresponding description (see Table 2).

Step 2. After defining agents, they are set within the context through holons, by identifying and enumerating the existing relations from subsystem up to macrosystem (rich vision); it is recommendable to make a chart (Table 2) to define all the agents with

Table 2. Agents

ICON	AGENT	DESCRIPTION
System		
1.		**Agent 1**
2.		**Agent 2**
3.		**Agent 3**
4.		**Agent 4**
5.		**Agent 5**
Environment		
6.		**Agent 6**
Suprasystem		
7.		**Agent 7**
Macrosystem		
8.		**Agent 8**
9.		**Agent 9**

Source: Compiled by authors

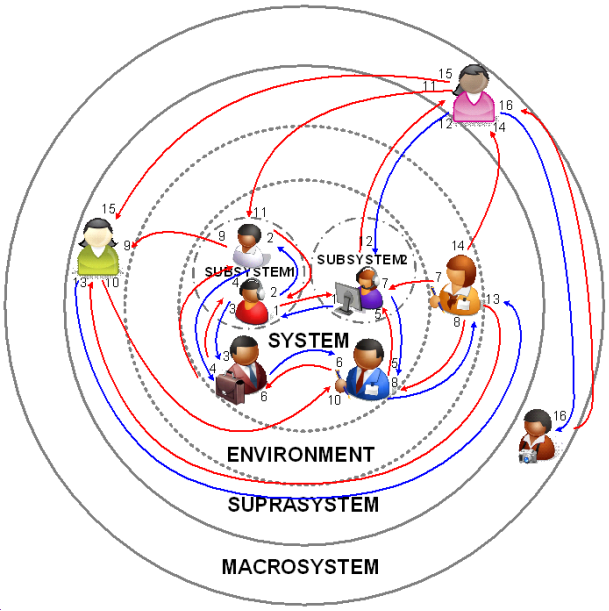


FIGURE 2. Rich vision
Source: Compiled by authors

the goal to use them in the rich vision of the system as it is shown in Figure 2, in order to understand much better how the system is composed and how it operates. It must be established the relations among the involved agents and observed emergent relations. Within the emergent relations it is important to take into account the negative feedback necessary to balance the system.

As it is observed in Figure 2 there are one-way and two-way relations that are represented by two arrows in opposed directions among the agents, depending on the interrelations they keep.

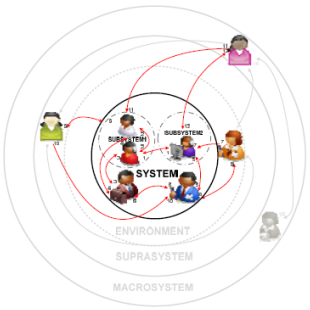
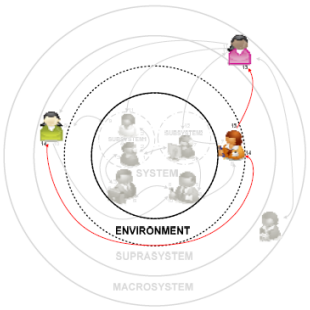
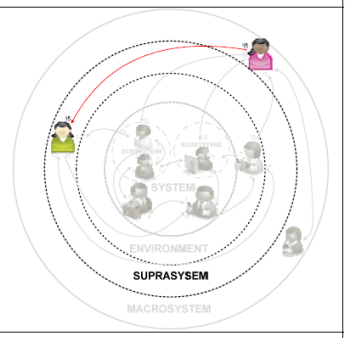
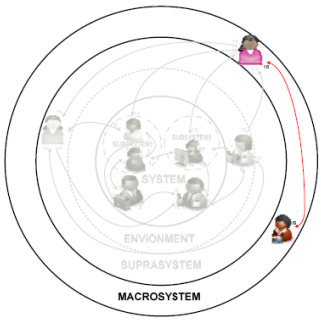
Next there are questions to be sure the diagram was well done.
Which is the system under study?
In which environment is the system operating?
Which are the subsystems?
How is the system interacting with the environment?
What are the connections among all components?
Is the system balanced or which are the emergent relation necessaries to balance it?

STAGE 6: RELATIONS' ANALYSIS. In this stage it must be identified the way the problem would be confronted by setting its necessities. It has to be analyzed one by one the represented relations in rich vision, with the purpose of identifying and understanding each one's operation and the conflict among the agents if exists. Table 4 shows an example of relations' analysis.

From analyzing relations among different agents it could be possible to notice that its response is different according to the necessities and objectives; so that, in this stage there are eliminated relations and agents that are irrelevant or essential to solve the problem. In Table 4 there were identified, by shading in, those relations that take part of the solution, so then, to restructure the new situation, as is shown in Figure 3.

The proposed questions to make a good analysis of the relations in this stage are:
How is the existing relation among the agents?
Is there a conflict in this relation?

TABLE 3. Rich vision

System	**System**	
	Environment	
	Suprasystem	
	Macrosystem	
Environment	**Environment**	
	Suprasystem	
	Macrosystem	
Suprasystem	**Suprasystem**	
	Macrosystem	
Macrosystem	**macrosystem**	

Source: Compiled by authors

Is this relation directly affecting the problematic situation?
Is this relation essential to solve the problematic situation?

STAGE 7: CATWOE. This stage is based on the third stage of Checkland's Soft System Methodology [8], [17] named root definitions of relevant systems; root definitions are done as sentences to make a transformation from different perspectives based on six elements summed up in the acronym CATWOE (Table 5).

To classify the involved agents in the problematic situation, and to show the world view, letter W (Weltanchauung) from CATWOE, it is proposed to elaborate in Table

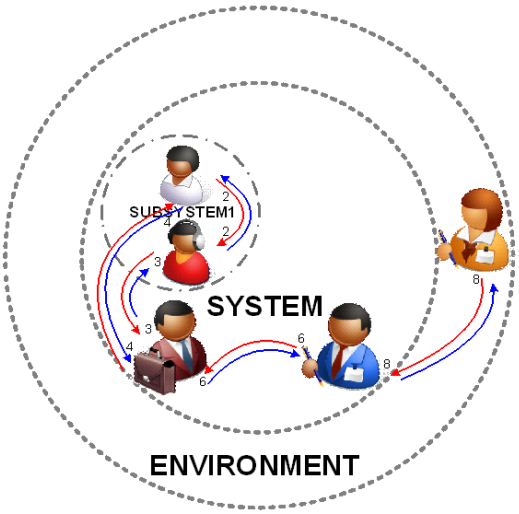


FIGURE 3. Rich vision
Source: Compiled by authors

6, in which split the positive vision and negative one from owner's versus customer's point of view. Figure 4 shows an example of a transformation in the methodology to solve economical-financial problems; in this transformation it is given a solution to a soft problem (it exists human activity) by using a hard system methodology.

STAGE 8: PROPOSED SOLUTION. After doing the qualitative analysis (stages 5, 6 and 7) it is proposed a suitable system implementation to the problematic solution (it is the solution system), taking into account the experts' opinion, the directly involved people for accepting the project and the users of the system's solution. In this stage there are new objectives to make the system solution, so that, it must exist a feedback to stage 3 (objectives of the system under study).

The way learners, readers, or researchers are attempting to establish whether the interventions proposed and implemented are beneficial or not, is by means of a process of scientific research, assessments or experimental studies in cases of study [18]. On the other hand, projects should have clearly defined the costs and benefits. Fact that emphasizes the importance of planning in a large number of assumptions about the project scope is needed to re-evaluate if the costs and benefits generated significant changes [19].

The proposed questions to select an appropriate system solution could be:
What is the experts' opinion?
In which area is the solution going to be implemented?
Which kind of information does the system have?
Which is the best way to present all the information?
What is the purpose of using the new system (forecast, create technological or regulating controls, investments, logistic or supply chain, among others)?
What type of infrastructure is it taken into account?
Is there another feasible solution to the proposal?
Are the benefits of the system solution significant to all the systems?

STAGE 9. HARD SYSTEM METHODOLOGY. After making the qualitative analysis and based on the proposed solution of stage 8, it is necessary to develop or to use a hard system methodology as a stage in the methodology for solving economical-financial problems. In this stage, the hard methodologies that use an implementation in one of its

Table 4. Rich vision

RELATION	ORIGIN – DESTINATION	CONFLICT
Conflicts of the System		
System – System		
1.	Agent 1 ↔ Agent 2	There are specified and described the conflicts of each relation among the involved agents with the purpose of emphasizing the ones which directly affect the problem.
2.	Agent 2 ↔ Agent 3	
3.	Agent 2 ↔ Agent 4	
4.	Agent 3 ↔ Agent 4	
5.	Agent 1 ↔ Agent 5	
6.	Agent 4 ↔ Agent 5	
System – Environment		
7.	Agent 1← Agent 6	
8.	Agent 5 ↔ Agent 6	
System – Suprasystem		
9.	Agent 1 → Agent 7	
10.	Agent 5 ← Agent 7	
System – Macrosystem		
11.	Agent 3 ← Agent 9	
12.	Agent 1 ↔ Agent 9	
Conflicts of the Environment		
Environment – Environment		
Inexistent		
Environment – Suprasystem		
13.	Agent 6 ↔ Agent 7	
Environment – Macrosystem		
14.	Agent 6 → Agent 8	
Conflicts of the Suprasystem		
Suprasystem – Suprasystem		
Inexistent		
Suprasystem – Macrosystem		
15.	Agent 7 ← Agent 8	
Conflicts of the Macrosystem		
Macrosystem – Macrosystem		
16.	Agent 8 ↔ Agent 9	

Source: Compiled by authors

steps must be simulated due to a risk analysis is proposed before implementing it in stage 11.

The proposed questions to select an appropriate hard systems methodology could be:
In which area is the solution going to be implemented?
Which type of solution is going to be implemented?
Which is the area that the solution system belongs to (technological or regulating controls, investments, logistic or supply chain, among others)?
Does the selected methodology perfectly fit the solution system?

STAGE 10: RISK ANALYSIS. Within financial conflicts risk analysis is an essential element to be considered. There are new methods of risk management that have been designed to benefit the interests of large institutions that operate in the financial markets.

Table 5. CATWOE

INITIAL	MEANING	DEFINITION
C	Customer	Involved agents who may gain benefits or disadvantages of a system.
A	Actor	All the agents that interfere into the system's transformation. They transform the inputs into outputs and they perform the activities defined in the system. They could be the customers and the owners.
T	Transformation process	The conversion that agents make to transform the inputs into outputs.
W	Weltanschauung	It refers to the point of view from the customers and owners perspectively, the positive or negative vision from the different roles to make the transformation process meaningful in context.
O	Owner	Each system has an owner who has the power to start and shut down the system (power of veto).
E	Environmental constraints	External elements that must be considered. They include organizational policies as well as legal and ethical matters.

Source: Compiled by authors based on SSM.

Table 6. Weltanschauung

Agent	***Owner***		***Customer***	
	Positive	***Negative***	***Positive***	***Negative***
Agent 2				
Agent 3				
Agent 4				
Agent 6				
Agent 8				

Source: Compiled by authors based on SSM

It is impossible to reach a completely satisfactory solution to the posed problems for different reasons being aware the risk never disappears; it is only managed seeking to develop methods intuitively plausible and effective in practice, both in historical evidence and in the current market [20].

Before implementing the solution system it must be taken into account if the financial vulnerabilities are meaningfully reduced in order to avoid some of these ones would exploit because of a threat. There exist several methodologies to apply risk analysis which can be used in this stage; in this one, it is done a comparison with the obtained results in the fifth stage and the obtained information from the simulation in the eighth stage; here it is possible to feedback Stage 5 or to make the necessary modifications to the solution, or, in another case, to proceed to the implementation in Stage 10. For the comparison see Figure 5.

STAGE 11: SYSTEM'S IMPLEMENTATION. It can be observed in engineering and researching subjects that there are systems (such as the computational and artificial among others) where the major analysis is in the simulation step, and sometimes the implementation and simulation are in the same step. On the other hand companies have to adapt to the new communication technologies [21], taking as a result of cost and time

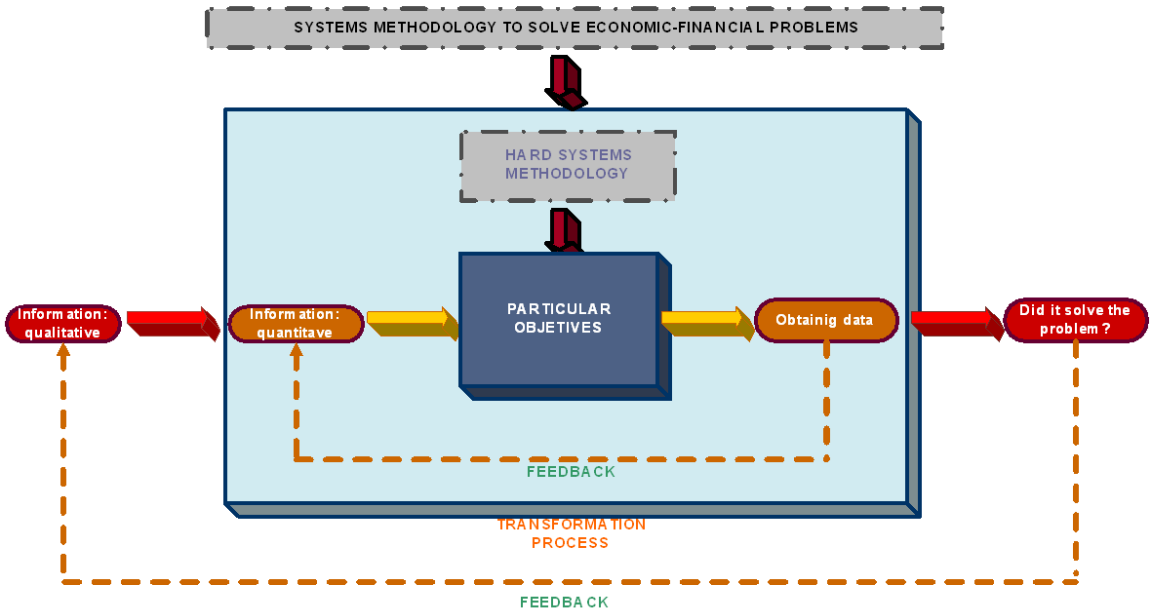


FIGURE 4. Transformation
Source: Compiled by authors

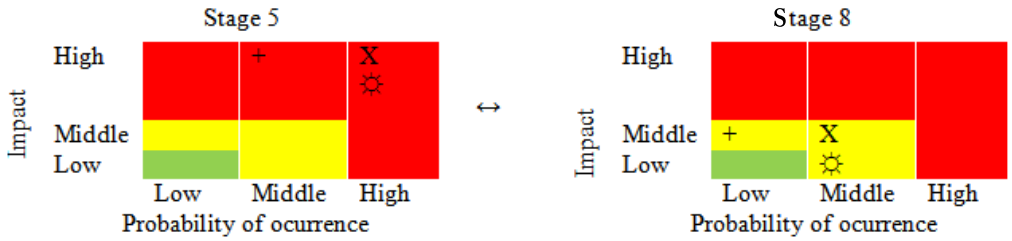


FIGURE 5. Risk matrix
Source: Compiled by authors

reduction in comparison with physical prototypes and experimentation [22], so that, in several economical-financial projects it is done a behavior analysis by computer simulation. For this reason, sometimes the implementation is done at the same time with applying the hard methodology system (Stage 9).

It is necessary that all the proposed system would be well implemented in order to be useful. When having the final solution it must emphasize specific proposals to take decisions. It is important to take into account that the implementation stage of the designed system is a part of the global design of the system, so that the results must be simple, direct and logic to show a precise plan to implant the system.

The recommended questions to the implementation are:
Is there an agreement to implement the proposal design?
Is there a plan to implement the proposal design?
Does every involved person understand the proposal?
Are the procedures and the required sources well detailed to implement the proposal design?

STAGE 12: CONTINUOUS IMPROVEMENT TO THE HARD SYSTEM.
It must be detected the changes that are possible to make to the implemented hard system

in order to improve it, if the feedback shows its perform which is not the expected one and all the factors must be reviewed. Therefore, in this stage there is a cycle of continuous conceptualization and changes to feedback Stage 8, always to improve the hard system.

The proposed questions to this stage are:
What kind of control system is necessary to achieve and maintain the optimal operation conditions?
Where is the system's operation going to be controlled?
Are all the involved people's responsibilities clear and well defined?
Are the users convinced that it is possible to operate the designed system?
Is the system working as it is expected? If not, what is causing a problem? How is the system failing?
Do some aspects of operation need special attention after the implementation?
Does the system need to be re-designed? If yes, how is it going to be?
Finally: is the result appropriate to the correct function of the system?

STAGE 13: CONTINUOUS IMPROVEMENT TO THE SOFT SYSTEM. As the previous stage it is necessary to detect possible changes in the general system in order to continuously improve the system's perform; it is possible to find some important parameters to be changeable in the system design from the operation's system. In this stage there is a feedback to fifth stage to represent the continuous conceptualization and changes to the soft system.

The questions in this stage are the same as previous ones focusing on soft systems.

3. **Main Results.** Some of the cases where the proposed approach has been applied are:

1. MexDer case, a model is proposed to predict the future trend of the Mexican Derivatives Exchange (MexDer) by using Artificial Neural Networks developed in Step 9 using hard methodologies [23].

2. Afore case. A case of study on fund managers for Retirement (Afore), building, optimizing and covering (against market risk by volatility in the prices of various financial assets) a portfolio of investments that will reduce the loss of developed workers' savings for their future resources [24].

4. **Conclusions.** A Systems Methodology to Solve Economical-Financial Problems (SM EFP) and its development was proposed and presented. While the application of the methodology described systems can result in extensive design process, resulting in an exploration of system requirements and system designed to adapt to these requirements.

The proposed methodology is based on some stages of MSS Checkland but specifically focused on the financial and economic area, which is why according to the implementation that comes to fill in Step 3 can sometimes considered metamethodology, causing the MSPEF adaptable to any financial or economic system since some steps can be carried out jointly.

There are many benefits of using a hard systems methodology together with a methodology of soft systems in economic and financial problems, because the system is considered complex cultural and social. To build and develop a systematic methodology to troubleshoot and being able to adapt to any system of that area can make a correct and appropriate solution to issues raised with respect to risk, time, capital and processes.

From systemic analysis you can get a broader and richer vision of addressing this problematic that, according to the cases made, the 13 stages meet the identified needs. However there are some advantages and disadvantages that should be mentioned. See Table 7.

TABLE 7. Advantages and disadvantages of SMEFP

	Advantages	Disadvantages
PART 1. Epistemological Thought	Known concepts and theories involved are studied in the area to be analyzed. Reliable data is specified with the problem at hand. Specific objectives are established and individuals to solve the problem.	Involves insight into the theories to be used. Time is extended to collect information theories.
Stage 1. Problems		
Stage 2. Concepts		
Stage 3. Theory		
Stage 4. Objectives		
PART 2. Real Vision Problems	There is a general and specific vision of each of the agents involved in the problem. Quantitatively and qualitatively analyze systems. Fit any statistical method to complement the methodology. There is a section on risk analysis which can be substituted by any other method, for the hard area of methodology.	The system analysis is large, covering the view of every element of the system.
Stage 5. Systemic Analysis		
Stage 6. Analyze Relations		
Stage 7. CATWOE		
Stage 8. Proposed Solution		
Stage 9. Hard Methodology		
Stage 10. Risk Analysis		
Stage 11. System's Implementation		
Stage 12. Continuous Improvement of Hard System		
Stage 13. Continuous Improvement of Soft System		

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