

## Toward understanding the complexity of the COVID-19 crisis: a grounded theory approach

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**Abstract.** *The purpose of this paper is to investigate the complexity of the COVID-19 crisis by using the grounded theory approach. It is a new approach based on a data set constituted from published papers, reports delivered by official organizations or research institutes, working papers, and public information in media. Each of these documents presents data, information, knowledge, and ideas, usually from a single perspective. The present research uses the method of grounded theory and constructs an integrated model of analysis that explores the complexity of the global crisis induced by COVID-19. For the present research, the data were extracted from published papers focused on different aspects of the COVID-19 pandemic induced economic crisis. That means a meta-analysis of the initial quantitative data but performed from a semantic perspective. The findings show that COVID-19 induced economic crisis is a complex phenomenon that is influenced directly and indirectly by the health system crisis, governmental policies, and behavior of people. The integrated model we got can be used as a tool in a further investigation for a deeper understanding of the complexity of COVID-19. The originality of this paper comes from creating a meta-analysis with the grounded theory of different aspects investigated in a series of papers and constructing a dynamic model capable of approaching the complexity of this Black Swan phenomenon.*

**Keywords:** COVID-19 pandemic, grounded theory, health system crisis, economic crisis, people's behavior, qualitative research, codification.

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### Introduction

The COVID-19 pandemic is a *Black Swan* phenomenon by all characteristics defined by Taleb (2008). "First, it is an *outlier*, as it lies outside the realm of regular expectations because nothing in the past can convincingly point to its possibility. Second, it carries an extreme impact. Third, in spite of its outlier status, human nature makes us concoct explanations for its occurrence *after* the fact, making it explainable and predictable" (Taleb, 2008, pp. xvii-xviii). The logic of such a phenomenon is that it makes *the absence of knowledge* more relevant than the knowledge we have about epidemics.

The COVID-19 started as an epidemic in the City of Wuhan, Province of Hubei, China, in December 2019. The novel coronavirus belongs to the "*Coronaviridae* family and is widely distributed in humans and other mammals. The virus is responsible for a range of symptoms, including dry cough, fever, fatigue, breathing difficulty, and bilateral lung

infiltrations in severe cases" (Nadim et al., 2020, p. 25). However, there are some similarities with epidemics caused by SARS-CoV and MERS-CoV, the COVID-19 epidemic developed with unimaginable high speed and an unbelievable aggressiveness (Guang et al., 2020; Ho et al., 2020). Due to some antigenic mutations, people lack immunity to this new virus. According to the research performed on the epidemic dynamics in China, the average incubation period was 5.2 days, and the doubling time of the epidemic was 7.4 days. The rate of contagion was estimated to be 2.2-3.8 people, which says that each infected person can transmit the virus to the other 2.2-3.8 people on average (Zhou, 2020, p. 35). "All this is due to the highly contagious nature of the virus, and the inexorable implications of its explosive spread during the acceleration phase" (Baldwin & Di Mauro, 2020, p. 1). On 11 March 2020 COVID-19 has been declared a *pandemic* by the World Health Organization (WHO), as the number of infected people increased dramatically up to about 200,000 cases across 160 countries (Spinelli & Pellino, 2020).

COVID-19 created a crisis in all national health systems because the high contagion rate of the virus increased the number of infected individuals so dramatically that the treatment capacity of hospitals became overwhelmed in many countries, like Italy and Spain. Lack of knowledgeable people in such kind of infections, shortages of protection equipment and adequate technologies, and the inexistence of a necessary vaccine created a state of fear and stress both in the medical staff and in the general population (Aum et al., 2020; Chang & Velasco, 2020; Greenberg et al., 2020). Governments had different responses to the COVID-19 crisis in different countries. Their public policies ranged from ignoring the huge infectious potential of the novel coronavirus, like UK in the first stage of the epidemic, up to fast reaction to mitigate the virus diffusion by imposing emergency states, like South Korea and Japan. The government role became crucial in all the countries because only through coordinated public policies and application of specific legislation, it is possible to impose restrictions on the people behavior and business enterprises.

The COVID-19 pandemic is a very complex phenomenon because it generated unexpected crises in the national health systems, economic systems, educational systems, cultural systems, sports systems, and social systems. These crises are connected through people, and their evolution depends strongly on people's behavior and public policies in each country. However, lockdowns in many economic sectors and severe restrictions imposed on people's mobility, lead naturally to drastic consequences for international businesses. Closing down hotels, restaurants, international train and airplanes companies, global markets for tourism reached the bottom-line for survival.

Researchers all over the world studied many aspects of all these phenomena, but their analyses focused on very specific domains like health systems, economic systems, or educational ones. Their findings are interesting, but the question is how to integrate these findings such that we can reveal the complexity of the COVID-19 phenomenon. The purpose of this paper is to offer a possible answer by using the capacity of the *grounded theory* to investigate complex phenomena based on integrating qualitative data in a progressive way. The structure of the paper is the following: after this introductory part, we present the main features of the grounded theory method, and then we discuss the methodology adopted for the present research. It follows a section of results and discussions, some final conclusions, and the list of cited references.

## The grounded theory method

The pioneers of this theory are Barney G. Glaser and Anselm L. Strauss, who had the insight of creating a qualitative research method that allows the conceptual framework to emerge during the process of analyzing the collected data (Glaser & Strauss, 1967). Although there are some different interpretations of this pioneering work (Corbin & Strauss, 2015; Glaser & Strauss, 2017; Remenyi, 2014), the kernel of grounded theory “consists of systematic, yet flexible guidelines for collecting and analyzing qualitative data to construct theories ‘grounded’ in the data themselves” (Charmaz, 2006, p. 2).

While in quantitative research, we start with a research model in mind, and based on it, we formulate the research hypotheses and design the questionnaire, in grounded theory, we construct the conceptual framework during the processing the collected data. Instead of using dedicated statistical data analysis software like SPSS, STATA, or PLS\_SEM in order to confirm the initial hypotheses and to validate the research model, in grounded theory, we formulate hypotheses during our investigation and decide upon further and deeper investigation. In quantitative research, the number of respondents and their statistical distribution is very important, in grounded theory, our aim is to obtain significant qualitative data, regardless of the size of the sample. Thus, the effort of construction by following our intuition and imagination is the main feature of the qualitative investigation. As remarked by Maxwell (2013), “A conceptual framework for your research is something that is constructed, not found. It incorporates pieces that are borrowed from elsewhere, but the structure, the overall coherence, is something that you build, not something that exists ready-made” (p. 41).

Qualitative data used in grounded theory can be extracted from direct observations, personal research journals, interviews, technical and scientific reports, public policy documents, published papers, book chapters, books, historical documents, biographies and other sources which contain information of interest for the research topic (Charmaz, 2006; Corbin & Strauss, 2015). “One of the virtues of grounded theory studies and qualitative research in general is that there are many different sources of data” (Corbin & Strauss, 2015, p. 37). The method implies a constant comparison between data collected from different sources to establish similarities and differences, based on which to extract ideas and construct iterative levels of abstractions. Qualitative data collected from literature already represent the first level of statistical analysis of primary quantitative data done, usually with specialized computer codes (Bryman & Bell, 2007; Wagner, III, 2017). Thus, applying grounded theory for qualitative data extracted from papers published in research journals, research reports, and official documents prepared by national and international organizations means to perform a meta-analysis at a higher level of thinking, by using inductive and abduction methods. While when using *induction*, we start from analyzing individual cases and try to extrapolate the findings to a larger population, in *abduction*, we begin by examine the given data and try to find explanations for them and then form some hypotheses which follow to be tested dynamically in the meta-analysis process. The aim of this dynamic process is “to arrive at the most plausible interpretation of the observed data” (Charmaz, 2006, p. 186).

In performing that meta-analysis, a researcher needs an adequate understanding of the theory of knowledge fields and knowledge dynamics (Bratianu & Bejinaru, 2019, 2020). In qualitative research, the researcher is part of the process, and objectivity implied in collecting and interpreting quantitative data cannot be obtained anymore. Moreover, the

researcher interprets the qualitative data through his rational, emotional, and spiritual mind. "The impact comes in the meaning given the data, the concepts used to stand for that meaning, the questions that are asked, and comparisons that are made" (Corbin & Strauss, 2015, p. 46). The researcher thinks through the lenses of a given education and culture, and no matter how much effort he makes to be objective, the method cannot eliminate the subjective dimension (Maxwell, 2013; Moustakas, 1990). Also, the researcher is using metaphorical thinking that makes use of both conscious and unconscious mind (Boroditsky, 2000; Casasanto & Jasmin, 2012; Lakoff & Johnson, 1980, 1999).

The next stage of grounded theory after collecting qualitative data is focused on the codification of selected data. The process of *codification* is done by segmenting the data and giving a name to each segment. Segmentation procedure depends on the type of data and the need for not losing from initial meanings because segmentation is inherently a linearization of the semantic field that is nonlinear. Linearization represents only an approximation of the initial semantic entity, and it must be done with minimum errors (Senge, 1990). This decomposition of the initial field of meanings into segments representing concepts, attributes, or relationships should not be done mechanically but with due attention to the semantics carried by the qualitative data. Codification introduces through labels some semantic categories, and thus it represents a categorization or classification process. It is followed by a conceptual structuring process that creates a framework for the emergent theory. As Charmaz (2006) underlines, "Coding is the pivotal link between collecting data and developing an emergent theory to explain these data. Through coding, you define what is happening in the data and begin to grapple with what it means" (p. 47).

There are several procedures for codification, from very simple like word-by-word to more sophisticated ones like axial coding and theoretical coding (Charmaz, 2006; Corbin & Strauss, 2015; Glaser & Strauss, 2017). The more advanced coding procedures increase the level of conceptual analysis by relating categories to subcategories and their specific properties. The codification process is an iterative and emergent process, aligned to the basic philosophy of grounded theory. During that process, unexpected ideas may emerge, and they should be integrated into the developing conceptual framework. Specific for grounded theory is the use of the integrated theory of knowledge fields and knowledge dynamics (Bratianu & Bejinaru, 2019, 2020). That means opening our interpretation to the emotional and spiritual dimensions of knowledge. "When doing analysis, it is important to bring emotions and feelings into the analysis. Emotions and feelings cue the analysis as to the meaning of events to persons" (Corbin & Strauss, 2015, p. 100). A good example is COVID-19 phenomenon that created a state of fear and pessimism in population, with negative consequences in people's behavior (Aum et al., 2020; Chang & Velasco, 2020; Greenberg et al., 2020).

The next stage in the grounded theory process is *memo-writing*. When writing these memos, we try to capture the possible connections between concepts and ideas identified during the codification phase. We may create conceptual maps and diagrams with these connections and analyze the logic behind the causal or structural connections. A very useful tool in visualizing these connections is to draw simple diagrams and flow-charts and to follow the flow of information. When things are not clear enough, we must formulate questions and go back to the initial qualitative data for a new interrogation of their meaning, and functional role in the whole assemble. "Qualitative analysis involves complex

and cumulative thinking that would be very difficult to keep track of without the use of memos and diagrams. Furthermore, thoughts change over time. Writing memos and doing diagrams enable researchers to keep a record of those changes and to see the progress or lack of progress in the analysis” (Corbin & Strauss, 2015, p. 118).

Grounded theory is an emerging process that implies an iterative approach and a circular conceptual motion. A researcher makes continuous comparisons between concepts and ideas and tries to integrate them into a dynamic picture. When things do not converge toward a coherent design, the researcher steps back and asks questions, and re-examine some of the previous concepts and correlations. Also, he continues by bringing in analysis new concepts and ideas based on *theoretical sampling* procedure. That is a selective way of searching for needed concepts and ideas valuable for the whole conceptual construction. Unlike the linear sequences of developing a quantitative study, in grounded theory, the researcher moves freely forward and backward until the conceptual framework gets a coherent structure and meaningful dynamics. This nonlinear and somehow random process continues until the researcher reaches a level of data *saturation* that is “usually explained in terms of when no new categories or relevant themes are emerging” (Corbin & Strauss, 2015, p. 139). Data saturation tells the researcher to stop adding new qualitative data and to focus on integrating all the concepts and ideas into an abstract *whole* that represents the *emerging grounded theory*.

## Methodology

The present research is based on *grounded theory* and the leading idea that COVID-19 is a complex phenomenon that cannot be deeply understood by using some procedural and rigid quantitative methods. By using quantitative research, we can find many interesting statistical correlations between the variables which describe only some aspects of the pandemic, but not the whole and its complexity (Baldwin & Di Mauro, 2020; Bryman & Bell, 2007; Frankfort-Nachmias & Nachmias, 2000; Maxwell, 2013).

Qualitative research is open to a more flexible approach and imaginative interpretation of facts and data. Regardless of the methods used, the investigation is based on the basic idea that subjectivity is part of the research and that the researcher becomes an actor in his research process. That allows him to evaluate the fitness of the method with respect to the needs to be investigated and to adjust his tools and interpretations continuously. Grounded theory is conceived as an emergent process based on iterations and a holistic approach. That allows the grounded theory to approach understanding *complexity* much better than any quantitative method that is focused on only a part or aspect of the COVID-19 pandemic, like health system crisis, economic crisis, educational crisis, people’s behavior, or public policies to mitigate the epidemiological curve. Approaching the complexity means to put together all of these aspects and to find the correlations between them, and the whole system of systems.

Discussing the complexity generated from simplicity, Bird (2003) shows that “The answer, as with so many things, lies in iteration. It is iteration that produces complexity out of a simple process” (p. 107). The holistic approach is based on systems thinking (Gharajedaghi, 2006; Senge, 1990) and a strategic perspective (Bratianu, 2015). In systems thinking, the focus is not on the components of the system, but on the relationships between them and on synergy created at the system level by their relative contributions. Managing complex systems is different from the well-known paradigm of command-and-

control of classical management. The new paradigm is based on entropic thinking, nonlinearity, and chaos theory (Bratianu, 2015; Gleick, 2008; Jackson, 2019; Stacey, 2001; Stacey et al., 2000).

The originality of the present research comes from the fact that we used as sources of qualitative data papers published in international journals, and official reports of the World Health Organization (WHO) and public policies issued by governments from different countries. Thus, instead of designing interviews, we searched in the wealth of articles and documents focusing on different aspects of COVID-19 pandemic. Because many of these qualitative data already represent a first phase of processing raw data, we perform a meta-analysis of these qualitative data extracted from significant published sources.

Understanding complexity means to consider COVID-19 pandemic manifesting in different forms and intensities in different countries as a result of different public policies and of different cultures, which play a fundamental role in people's behavior. Thus, considering the context is very important in understanding and interpreting the findings of grounded theory research (Corbin & Strauss, 2015; Charmaz, 2006). For instance, there are cultures built on the idea of discipline and respect for regulations, regardless of the level of their creation (i.e., organization, local public administration, government or parliament), and cultures where people ignore them usually in their daily activities. The best example during this COVID-19 pandemic is the rule of wearing a mask in closed spaces and of keeping a certain social distancing, rules that many people ignore, especially in Mediterranean cultures.

In the first phase of our research we were looking for published papers in the mainstream international journals, book chapters and books published in the most known databases and publishing houses like Web of Science, SCOPUS, Emerald, JSTOR, PROQUEST, De Gruyter, Springer, CEEOL, Oxford University Press, Cambridge University Press, Wiley online, London School of Economics and many others. Also, we were looking for official reports issued by the World Health Organization (WHO), European Commission, and public policy documents with specific measures for flattening the epidemiological curve in different countries. From that wealth of publications, we selected those papers which are significant, especially for four domains: health system crises, economic system crises, medicine, and people's behavior (i.e., psychology and sociology).

We started to study paper by paper, and during the process of reading, we performed *codification* for the basic concepts and ideas found in these documents, after we coded each paper by using the family name of the first author. For example, the following paper: Greenberg, N., Docherty, M., Gnanapragasam, S. & Wessely, S. (2020). Managing mental health challenges faced by healthcare workers during COVID-19 pandemic. *The BMJ*, 368, m1211. DOI: 10.1136/m1211, was coded [Greenberg]. To illustrate the codification process, we shall consider the following phrase (Greenberg et al., 2020, p. 2): "Health staff are at increased risk of moral injury and mental health problems when dealing with challenges of COVID-19 pandemic." We synthesized the meaning and applied the code [risk of moral injury for healthcare staff]. This code helps us to classify the qualitative data in the category of "people's behavior".

Let us consider another example with the paper: McKibbin, W. & Fernando, R. (2020). The global macroeconomic impacts of COVID-19: seven scenarios. CAMA Working Paper 19/2020, February 2020. Centre for Applied Macroeconomic Analysis, Australian National University, Canberra, Australia. We applied the code [Kibbin]. Now, we illustrate

the coding of some phrases, with the following example (McKibbin & Fernando, 2020, p. 2): “Amidst the showing down of the Chinese economy with interruptions to productions, the fluctuating of global supply chains has been disrupted”. We applied for this phrase the code [COVID-19 created a global economic crisis], and we classified the item in the domain of “economic system crisis”. The first codes we applied are not definitive. They can be reformulated when we proceed to a backward iteration to match the new interpretations we get during our analysis. The codification process is an important tool for identifying the correlations between concepts and ideas, and for creating topical clusters.

We found a *saturation* level after analyzing in detail 31 documents, and then we stopped. We continued to search for data in some other documents but only for eliminating some ambiguities and getting more clarification on some aspects.

After codification, we started a meta-analysis of all the coded ideas trying to create comparisons and analogies to help us in understanding the correlations between them and based on these correlations to construct an integrated model. We prepared some memos and diagrams to help us in building up progressively an integrated view of the pandemic within the framework of dynamics between the health system crisis and the economic system crisis. Finally, we came up with an integrated model capable of explaining the complexity of the COVID-19 pandemic within the defined framework.

## Results and discussions

### *Health system crisis*

On 31 December 2019, WHO was alerted about an outbreak of pneumonia patients in Wuhan City, Hubei Province of China. On 7 January 2020, Chinese authorities announced that they identified a new coronavirus as the cause of that pneumonia, and proposed for that virus the provisory name of 2019-nCoV. On 3 February 2020 WHO elaborated a plan for strategic preparedness and response to stop further transmission of the new coronavirus (WHO, 3 February 2020, p. 8), containing the following main objectives:

- Limit human-to-human transmission of the coronavirus infection.
- Identify, isolate, and care for patients in specialized hospital sections.
- Address crucial unknowns regarding clinical severity, extent of epidemic, and treatment options.
- Minimize social and economic impact.

On 11 March 2020, WHO declared COVID-19 a *pandemic* based on the unexpected diffusion of coronavirus infection and the amplitude of this phenomenon (Baldwin & Di Mauro, 2020; Spinelli & Pellino, 2020; Zhou, 2020). In a recent *Situation Report* (WHO, 15 July 2020), it shown that globally the total number of infected with coronavirus cases increased up to 13 150 645, with 185 836 new cases reported in last 24 hours; the total number of deaths reported is 574 464, with 4 176 new cases reported in last 24 hours. It is a dramatic situation that generated health system crises in most of the countries all over the world. And the situation is worsening in many of them due to people's behavior and limited hospital capacity, insufficient specialized medical staff, lack of critical knowledge for an efficient treatment and the inexistence of a proven vaccine yet. “Given there are no 21<sup>st</sup> century tools to fight the virus, the key is to ‘flatten the epi curve’ to avoid bottlenecks in the health care system that result in suboptimal treatment (and thus more deaths)” (Baldwin & Di Mauro, 2020, 7). That cannot be done without the intervention of governments and a

series of public policies and concrete measures. *Thus, we reach an important correlation between the health system's crisis and government intervention.*

### ***Government public policies***

Without the Government intervention and implementing some public policies, the epidemic may develop exponentially, like a nuclear reaction, and create a dramatic situation for the population's health. The epidemiological curve shows that the acceleration phase of the infections follows almost an exponential evolution reaching very fast a level of infected persons over the capacity of hospitals and medical staff to treat them. The strategy of flattening the curve means drastic measures like declaring an *emergency state* for a limited period of time that is usually up to 30 days. During such an emergency state, the government introduces a series of restrictions concerning the mobility of people and of the functioning of different institutions and enterprises. For instance, restaurants, terraces, shopping centers, theaters, sports clubs, schools, universities, and many other businesses were closed down. Companies were requested to initiate new forms of working from home, and schools and universities to switch their educational programs online, by using specialized platforms for meetings and e-learning. All these efforts to flatten the epidemiologic curve reduce the economic activity dramatically (Coibion et al., 2020; McKibbin & Fernando, 2020; Surico & Galeatti, 2020). "The recession, so to speak, is a necessary public health measure. Keeping workers away from work and consumers away from consumption both reduce economic activity" (Baldwin & Di Mauro, 2020, p. 8). *Thus, we reach to another important correlation, that between the health system crisis and the economic system crisis.*

### ***Economic system crisis***

The emergency states, with its drastic measures of closing down many businesses, lead to a surge in the number of unemployed workers, or in keeping them home with only a part of their salaries. That situation increases the probability of organizational knowledge risk (Bratianu et al., 2020a). At the same time, most of the companies were requested to develop working programs from home by using information systems. Teleworking or working online by using special platforms supported by information technology proved to be the new trend in the knowledge economy (Dima et al., 2018, 2019; Kostin, 2018). In U.S. "the employment-to-population ratio (the fraction of the adult population reporting that they had a paid job) has declined by about 7.5 percentage points. With an adult U.S. population of 260 million, this corresponds to nearly 20 million jobs lost as of April 8, 2020" (Coibion et al., 2020, p. 3). Furthermore, reducing the mobility of people and introducing severe limitations of traveling, lead to a severe decrease in market demand, which caused a reduction in the production of products and services (Alvarez et al., 2020; Delaporte & Pena, 2020; Hasanat et al., 2020; Reeves et al., 2020).

One of the most affected business domains is the tourism and hospitality industry. Restaurants, bars, and terraces, hotels, and their associated services and sports clubs have been closed down with dramatic economic consequences. Many countries entering the red zone of COVID-19 pandemic closed their borders for international land, air, and water travels, and introduced quarantine measures for people coming from other red zones. During summer vacation, in countries with targeted tourism for seashores and leisure activities, the tourism industry opened but with restrictions and special measures for



keeping social distancing. For all of these problems, governments made great efforts to balance health effects with economic effects of the COVID-19 pandemic. Flattening the epidemiologic curve inevitably impacts the macroeconomic recession curve (Aum et al., 2020; Chang & Velasco, 2020; Gourinchas, 2020; Solnit, 2020). Dramatic effects have been produced in the economic sector of SMEs, due to their relative small intellectual capital (Handa et al., 2019; Vatamanescu et al., 2019). One of strategic solutions for SMEs is to become learning organizations (Bratianu et al., 2020b).

Lin and Meissner (2020) make a synthesis of many ways in which the present pandemic impacts economy: “reductions in people’s willingness to work, dislocations in consumption patterns and lower consumption, added stress on the financial system, and greater uncertainty leading to lower investment. These are respectively referred to as (labor) supply shocks, demand shocks, financial shocks and uncertainty shocks” (p. 86). *Another conclusion we get is that the health system crisis impacts the government special public policies and concrete measures to flatten the epidemiologic curve, which impact in turn, the economic system crisis.*

### ***People's behavior***

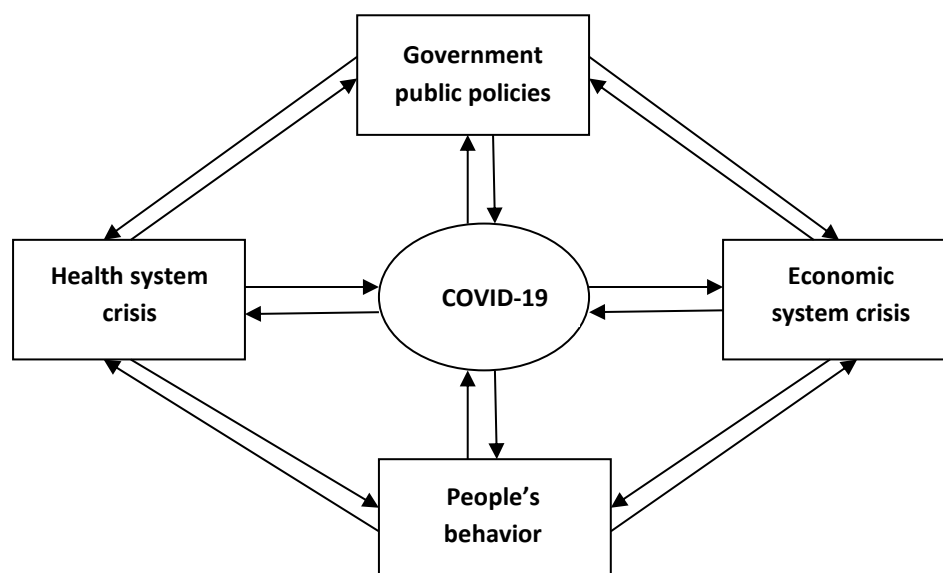
The key element in all these crises is people's behavior because human nature is not fully rational. Emotions, personal experiences, beliefs, and values are dominated by the unconscious cognitive processes, and thus it is very hard to understand the psychology of decision-making adequately, especially in time of crises, when the irrational aspects are more important than the rational ones (Ariely, 2011; Baron, 2000; Blake, 2008; Kahneman, 2011; Sutherland, 2013).

The COVID-19 generated a high level of *uncertainty* about what is happening due to the absence of critical knowledge to understand and to fight against it (Chang & Velasco, 2020; McKibbin & Fernando, 2020; Surico & Galeatti, 2020). The uncertainty is also about what will happen after the pandemic because all of these economic and social disruptions produced by COVID-19 are *irreversible*. “The current disruption will change how we eat, work, shop, exercise, manage our health, socialize, and spend our free time at an unprecedented rate of change” (Mey & Ridders, 2020, p. 2). After this pandemic, there is no way to return to the old way of living and working. There will be a 'new normal' life, with a new way of thinking. Many people do not realize it, but the most dramatic change generated by this pandemic is in our way of thinking. We will open our mind to the probabilistic and chaotic way of thinking, and we will accept that in real life nothing is certain, and the future is not an extrapolation of the continuous present but an emergent world populated with probable events and phenomena.

Stay home and working from home created also a new behavior and way of doing things and communicate. The knowledge dynamics changed by reducing the emotional contribution and increasing the rational role (Bratianu & Bejinaru, 2020). Business education should change to keep the rhythm with this changing environment. Teaching and learning will include more online activities and will focus on developing new needed competences (Bratianu et al., 2020). Learning should be integrating with unlearning to reduce inertial thinking and increase the absorptive capacity for new knowledge at individual and organizational levels (Bratianu et al., 2011; Cegarra-Navarro & Wensley, 2019). An important role may play intergenerational learning (Bratianu, 2014).

People's behavior is a nonlinear phenomenon that is difficult caught in mathematical modeling. That explains why mathematical models develop to explore the evolution of the COVID-19 crisis could not predict the explosion of the number of infected people in the period following the state of emergency. The drastic regulations and restrictions for people's behavior during the emergency state created stress and psychological pressure, which had a natural tendency of relaxation and ignoring the basic need of social distancing and avoiding agglomerations of people. Coupling this emotional state with the time of vacation induced an irrational behavior and an explosion of coronavirus infections in many countries in Europe, Asia, and America. The government had to find new ways of flattening the epidemiological curve, but without returning to the emergency state due to social pressure. *As a new conclusion, we may say that people's behavior is strongly correlated with the health system crisis, economic system crisis, and government public policies and regulations.*

Integrating all these aspects discussed above concerning the interdependencies between the health system, economic system and government public policies, we get a conceptual model that can be illustrated as in Figure 1.



*Figure 1. An integrated model of the COVID-19 pandemic dynamics concerning the health and economic systems*  
 Source: Author's own research

## Conclusions

The purpose of this paper is to find a new approach for understanding the complexity of the COVID-19 pandemic. There are many papers which present different aspects of the pandemic, but very few trying to integrate these aspects and to reveal the correlations between them. Although the COVID-19 started as an epidemic in the City of Wuhan, in the Province Hubei of China last December, it had an unexpected contagion rate and intensity

becoming very fast a pandemic, as declared by the World Health Organization in March 2020. The difficulty of understanding the evolution of this *Black Swan* phenomenon comes primarily from its complexity and from the irrational component of people's behavior.

The present research is based on *grounded theory*, a qualitative investigation method that allows an iterative construction of the conceptual model capable of incorporating all the aspects into an organic whole. The originality of this paper comes from using as sources for qualitative data papers published in journals and official reports concerning COVID-19 pandemic and its impact on economics and social life. Thus, instead of designing interviews for collecting qualitative data, we searched for papers and reports addressing different aspects of that pandemic and selecting out of them the most significant qualitative data. Unlike a review process of papers dedicated to a certain topic, in the present research we did not introduce filters for the selection of the mainstream journals. We were looking for the significance of data with respect to the correlations between the health system crises and economic system crises in different countries all over the world. Because the qualitative data selected were already a result of a primary analysis process, we performed a meta-analysis of these data by using the ideas of grounded theory. We codified the papers and the qualitative data, and we started to construct a conceptual framework based on them. We adopted an iterative and nonlinear process of integrating data that allowed us to go backward and forward any time we needed it for clarifying some aspects and deepening our understanding. We continued searching and analyzing papers until we reached a level of saturation from a novelty point of view. In other words, we stopped our analysis when the new papers contained no new data for the conceptual framework.

The focus of the present research is the correlation between the COVID-19 crisis created in the health system and the induced crisis in the economic system, considering the interventions of government through specific public policies and regulations. The most dramatic stage of the pandemic from this point of view was introducing a state of emergency in many countries. The purpose of that special and restrictive state of emergency was forced by the need of flattening the epidemiological curve and to eliminate the bottlenecks created in the health systems due to the explosion of coronavirus contagion.

All the correlations between the crises created in the health and economic system depend on people's behavior in the new pandemic conditions, under a high level of uncertainty and fear. Also, the requirement of staying home and working from home for millions of people changed the economic landscape and their emotional and spiritual knowledge dynamics completely. Learning and unlearning developed together in a new paradigm for survival and new living and working conditions.

Integrating all aspects together into an organic whole, we got a conceptual framework illustrated by five basic concepts and all possible correlations between them. The basic concepts are: COVID-19, health system crisis, economic system crisis, government public policies, and people behavior. Correlations act in all possible directions with different force and intensity, showing the complexity of the COVID-19 pandemic.

The limitations of the present research come from the fact that we considered only the health and economic systems and ignored many other systems like education, culture, sport, and religion. In a larger perspective, all these systems should be integrated and analyzed together in order to approach the unimaginable complexity of such a pandemic. Also, a limitation may be considered using only one qualitative research method, but we should emphasize its complexity and integrative approach.

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