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Rethinking the paradigmatic frameworks of performance measurement systems in the light of recurring globalized crises

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Abstract

Research question: Is the failure of performance measurement systems (PMS) due to the crisis in itself or to a radical change in the paradigm that governs the world that has caused a loss of momentum?

Motivation: In the era of recurrent/multiple crises, some researchers have signaled the inadequacy of the industrial economics paradigm and the managerial tools arising from them, and their inability to address the new characteristics of the environmental context. On this subject, we wonder whether the observed "malaise" of PMS is due to a possible paradigmatic obsolescence. If necessary, a redefinition of these systems should be considered so that the indicators regain their relevance.

Idea: In recent decades, crisis meant no more than a temporary disruption of an idealized situation. The recurrence of systemic natural, social, economic and other crises and the ensuing volatile, uncertain, complex and ambiguous business environment has become the rule and we need to reappraise the capacity for our tools to grasp the complex reality of our world.

Data/Tools: Building on complexity theory authors, the article aims to critically reflect on the paradigmatic foundations that give meaning (or not) to PMS.

Findings: The recurrence of crises reflects an obsolescence of the dominant economic and managerial paradigm advocating determinism, simplicity and certainty/predictability. PMS must be redefined in order to regain their relevance in line with the paradigm characterized by volatility, complexity, uncertainty and ambiguity.

Contribution: This paper makes two major contributions. First, we deconstruct the dominant model of performance assessment and measurement based on mechanistic industrial

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economics highlighting the limitations of traditional accounting methods in capturing the complex and dynamic nature of modern business environments. Second, we describe the main characteristics of the new business landscape and the original understanding of crisis to highlight the need to review traditional approaches to accounting indicators and performance measurement in this context of a complex, uncertain world.

Keywords: Performance Management Systems, Crises, Complexity, Managerial doxa

JEL codes: M40

1. Introduction

"We have created a world where a shock anywhere can turn into a disaster anywhere" (Gpmb, 2020: 3). This world characterized by a "globalization of crises" is shaken by economic and geopolitical flaws in the global economic and financial system (IMF, 2022). The basis of this system has been criticized by several economists and philosophers (e.g., Georgescu-Roegen, 1979; Boutang, 2008; Stiegler, 2020; Yunus, 2020; Latour, 2021). Are repeated crises not also testimony of a theoretical impasse that calls into question the legitimacy of the paradigm that governs current economic and managerial thought and practices? Performance and its measurement have become central elements of reflection since they can confine the action of managers to rigid frameworks of interpretation of an organizational reality.

Several researchers agree on the polysemy of the concept of performance and on the difficulty of defining it universally (Otley, 1980; Ford & Schellenberg, 1982). However, performance is often represented as "the achievement of organizational objectives" (Bourguignon, 1995: 65). In a competitive and rationalizing world, this definition is interpreted financially and therefore generates a performance measurement system focused on growth in the production and profitability of the company. Driven by major social demand, this system has integrated measures other than financial (quantitative, environmental, social, societal, etc.). However, it remains fundamentally technical and no longer responds to a paradoxical socio-economic-environmental reality. It is in this sense that numerous researchers have highlighted the paradigmatic crisis that "modern" managerial tools are facing (Marchesnay 2008; Beauvallet, 2009), criticizing the limits or even the paradoxical consequences of managerial practices based on this managerial doxa which is itself in crisis (Marchesnay, 2008). In this article, we question the relevance and therefore the paradigmatic legitimacy of measures in general and of performance measure systems in an environment of recurrent crises. This questioning becomes central, especially after the Covid-19 shock which, from now on, implies viewing the world in opposition to "the old" one.

This research is an analysis of "paradigmatic shift", a questioning of the founding principles of the predominant management doxa based on the paradigm of mechanistic industrial economics. It also highlights the abuses of the "blind" and "untimely" understanding of performance indicators that denote more of a fetishism of "counters", leading in many cases to "absurd" decision-making (Supiot, 2015; Beauvallet, 2009) where reality and its intended measurements are barely linked to organizational objectives. Moreover, and in line with Roux-Dufort (2007:110), we do not consider a crisis to be a one-off disruptive factor, rather, it signals a transition stage. In this case, "the event implies the transition from the before to the after, it bears the obsolescence of the past as well as the seeds of renewal". To this end, we propose a critical reflection on the paradigmatic foundation that gives meaning (or not) to performance measurement systems.

Hence, this article makes two major contributions in the management accounting literature. First, we deconstruct the dominant model of performance assessment and measurement based on mechanistic industrial economics highlighting the limitations of traditional accounting methods in capturing the complex and dynamic nature of modern business environments. Second, we describe the main characteristics of the new business landscape and the original understanding of crisis to highlight the need to review traditional approaches to performance measurement and management in this context of a complex, uncertain world requiring a holistic approach. This goes beyond broadening the firm's focus to include a wider range of indicators, such as customer satisfaction, employee well-being, and environmental sustainability.

The article is structured as follows: Section 2 presents a critical analysis of contemporary performance measurement systems, highlighting their incongruity with an ostensibly outdated paradigm. In Section 3, the managerial implications of a paradigm shift that restores the relevance of performance measurement systems are discussed. Section 4 raises ontological questions concerning the origin of the paradigmatic crisis and the recurrence of such crises. Section 5 examines the conceptual underpinnings of performance measurement systems from a paradigmatic perspective and presents key findings. Finally, Section 6 draws conclusions regarding the primary arguments presented and suggests avenues for further research.

2. Outdated performance measurement systems

The logic of the instrumental approach is that more quantified impact data leads to better solutions to address all negative effects. The accounting approach is another manifestation of the use of numerical measurement intended to empower those who participate in economic life. The illusion of controlling the negative impacts of massification (production, consumption, education, health, etc.) through the use of management indicators has spread throughout the world, making the quantified

solution the only one that counts (as in the mantra "what is measured gets managed" that has been falsely attributed to Drucker).

2.1 Technical foundations of performance measurement systems

The literature reveals that the retained performance indicators are organized as performance measurement systems according to the economic and/or political instrumental logic of the organization. Indeed, under a classic economic conception of the organization - defined on the basis of Taylor, Ford and Fayol, among others, as a closed and scientifically organized production system - the shareholder dimension prevails, and performance measurement systems exclusively serve financial objectives. However, several researchers have described the limitations of these systems and propose technical adjustments to broaden the fields of indicators. Among the most cited writings, the book by Kaplan and Johnson published in 1987 "Relevance lost: the rise and fall of management accounting" questions the hegemony of financial indicators that are unable to embrace multiple internal and external variables at the same time. These can make management information less relevant in a context where technological changes are fast, and competitiveness is growing. In 1992, Kaplan and Norton offered what was a new tool at the time, namely "the Balanced Scorecard" that integrated non-financial indicators. Other researchers have constructed different hybrid systems such as the matrix of determinants and outcomes proposed by Fitzgerald *et al*. (1991) and the performance pyramid devised by Lynch and Cross (1991). Theoretically, there was a need for emancipation from financial hegemony while keeping the interests of shareholders at the center of a changing world. However, the industrial economy framework was not questioned.

From the 1980s, an array of new theories emerged, such as stakeholder theory (e.g., Freeman, 1984; Donaldson & Preston, 1995), which argues that the achievement of organizational objectives requires the management of the needs of the various stakeholders of the company. Freeman *et al.* (2003:481) explain that "managing for stakeholders involves attention to more than simply maximizing stakeholder wealth. Attention to the interests and well-being of those who can assist or hinder the achievement of the organization's objectives is the central admonition of the theory". Customers and employees are particularly privileged in this perspective. Several researchers have proposed performance measurement models based on stakeholder theory (Morin *et al*., 1996; Atkinson *et al*., 1997; Neely *et al.*, 2001). They argue that the achievement of better financial performance requires the management of different interests, which gives the organization its "organizational relevance". The latter is considered to be one of the dimensions of performance.

However, the latest crises are not mere changes in action variables. It is the very relevance of performance measurement systems that is being called into question. For example, several adaptations of the balanced scorecard have been proposed to

keep it relevant as a crisis management tool (Sarriegi *et al.,* 2012, Dam & Thang, 2021). Ying-Li (2018) studied the impact of the 2008 financial crisis on the causal links of the balanced scorecard, demonstrating the existence of a difference between before and after the financial crisis. This result shows that after a crisis, the normal course of events can never be "as it was before". The event instantly imposes a before and an after, akin to a point of no return (Roux-Dufort, 2007). Furthermore, Dam and Thang (2021) believe that the Covid-19 crisis has created an urgent need to identify relevant performance indicators for decision-making and to ensure survival in the face of exogenous shocks. They proposed a dashboard that covers the financial, customer, web, social media and crisis response axes that the company can use to manage its adaptability.

2.2 The determinism of PMSs in crisis

Rongier *et al.* (2013) claim that during a crisis, the main objective of a decision-maker is to re-stabilize the system. To this end, they propose a performance measurement model during the crisis response phase based on the study of the characteristics of the system affected by the crisis, the selection of the components of the system to be evaluated as a priority, the determination of performance dimensions to be retained and finally the production of performance indicators. This and much similar research confirms that deterministic theories, whether structural (e.g., Woodward, 1958; Burns & Stalker, 1961) or behavioral (e.g., Simon, 1976; Löning *et al.*, 2008), only induce an accumulation of new variables in performance measurement systems (qualitative, non-financial, CSR, etc.), but apparently no longer allow us to understand a crisis and its possible consequences.

The deterministic assumption makes a complex reading of systems difficult. Thus, a crisis is only viewed as an isolated, exceptional and disruptive event of an idealized mechanical order. In this regard, Roux-Dufort (2007:105) remarks that "crisis management is perceived as the management of exceptional or out-of-the-ordinary situations". Generally speaking, Boumrar (2010:5) points out that researchers consider the crisis as the result of a cumulative process of organizational dysfunctions. Referring to Pearson and Clair (1998), Roux-Dufort (2007: 106) notes that "crises are then often defined as abnormal events that disrupt the developmental trajectory of an organization at a specific time and in a specific place… the priority should mostly be to rectify the imbalance as quickly as possible before other imbalances further deteriorate the situation". Consequently, we believe that bringing a system back to its initial state of operation after a crisis without questioning the deep origins of its dysfunction would not be helping organizations to deal with new crises.

3. Reconsideration or readjustment of PMSs?

Financial, economic and climatic crises follow one another and become not only difficult to manage but also generate profound, global consequences, as was the case with Covid-19. This black swan, as Taleb (2010) puts it, reveals the organizational failures of several companies by placing them in situations of "reactive incapacity". This highlighted how ineffective traditional managerial tools and practices were becoming. In this regard, several researchers (Perrow, 1984; Roux-Dufort, 2007; Boumrar, 2010; Taleb, 2012) argue that unexpected events are not exceptional, they are normal and inevitable, and can even be a source of benefits for the organization. They are a feature of a world that is shifting from predictability to unpredictability and increasing complexity.

3.1 Revamped technicality

To embrace complexity, several studies recommend the creation of management information systems that take into account the environmental uncertainty perceived by the manager (e.g., Gordon & Narayanan, 1984; Gul & Chia, 1994). Navigating in an unpredictable world presents leaders with the problem of defining a long-term strategy. Decision-makers hence find themselves faced with the problem of questioning the time horizon of strategic planning. In a context of uncertainty, volatility and rapid changes, the traditional approach to strategic planning, which is based on the principle of "plan-and-execute", can no longer be relevant in the face of the unpredictable; doing so may result in making incorrect decisions (Ansoff, 1979; Weick & Sutcliffe, 2007; Martin, 2014; Walker, 2022). Thus, managers can only focus their attention on operations rather than strategy (Walker, 2022), and failing that, the performance indicator will come to lose its cognitive effectiveness.

According to Lorino (2001), it is a question of focusing the actor's attention on the main lines of analysis and work by selecting a limited number of indicators linked to the levers of action and objectives. It is nevertheless necessary to provide for non-priority axes, in the form of vigilance indicators, which is the principle of the "iceberg method". For example, in order for companies to respond to the Covid-19 crisis, several consulting firms have emphasized the priority of financial indicators to monitor financial results and cash ratios. Sanchez-Marquez *et al.* (2020:2) argue that it is important to "reduce the number of key performance indicators (KPIs) at the strategic level by selecting the main ones in order to make periodic performance analyzes easier and more effective". Weick and Sutcliffe (2007: 16) suggest that decisions in complex environments should be made by "the people with the most expertise, regardless of their rank". These partial and scattered results only impose a new truth: the inclusion of complexity leads to a reduction in the complexity of performance measurement systems in order to increase their cognitive effectiveness, especially in the event of urgent decision-making.

The aim was to break from the procedural rationality approach defined by Simon (1976). This approach is based on the theory of action that assumes the use of the scenario system (Lorino, 2001) hence making it possible to solve foreseeable and routine problems by making programmable decisions (Marchesnay, 2011). With the increase in environmental uncertainty, the decision-maker is often led to make heuristic type decisions (Perrow, 1984). This point raises questions about the strategic and operational relevance of the performance measurement system based on this "if…then" causal logic. For example, the supposed causal links between the different dimensions of the Balanced Scorecard are controversial and unclear (Sanchez-Marquez *et al*., 2020).

Finally, and more recently, several researchers and practitioners have called on organizations to adopt resilient behavior, which according to Parmentier (2020) is a quality by which nature is distinguished. The latter explains that biomimicry as a method for inspiring the common good is based on an observation: the building of resilient systems is a part of nature, through principles of parsimony, cooperation, optimization and responsibility mobilized for the sustainability of ecosystems. Resilience is used to describe or assess the reaction of individuals, groups or systems to disruptive events (Marquis, 2018). It was the neuropsychiatrist Boris Cyrulnik (1999) who drew attention to the phenomenon of resilience, which he defines as the ability to succeed, to live and to develop in the face of adversity.

In its "Global Crisis Survey" published in 2021, the consulting firm PriceWaterhouseCoopers argues that the more organizations are prepared to manage shocks, the less they are at risk of suffering serious harm, and will become more resilient against future threats. But concretely, how can we be prepared to manage shocks if performance measurement systems continue to respond to ideological choices that, coupled with the power of management tools, lead to simplified evidence and individual and decontextualized performance choices?

Shocks are events that have become part of normal business activity and which, according to Perrow's (1984) theory, are normal and unavoidable accidents in a complex environment. Globalization is a strong example of this extended use of simplification. It gives substance to a unity manufactured by an inescapable standardization and centralization (top-down). Both become central drivers for a unique and possible expression of efficiency. Simplification does not make the elements of reality simpler; it risks disempowering and dehumanizing humans in their action on the world (Besnier, 2012).

3.2 From technicality to complexity

Stacey (2016:8) argues that the functioning of organizations derives from Newton's mechanistic model of the universe and Darwin's model of evolution by Natural

selection. He explains that "the Newtonian explanation of the behavior of inanimate systems uses linear approximations of admittedly nonlinear systems to predict the behavior of the system. The laws explain how the system works, nothing is left to chance, small errors of calculation yield small errors in prediction, and we humans can be 'in control' because we can predict the behavior of such perfectly deterministic systems". This cybernetic approach which views the organization as evolving in a stable and predictable environment obeys the objective-plan-action-control sequence, whereby forecasts can be established easily and controls can be applied to the results. In a complex world, Stacey (2016:10) asserts that "the links between our next actions and their long-term outcomes disappear so that no one can be 'in control'". In this context, some researchers propose that organizations should be conceived as "complex adaptive systems", or even "self-regulated systems", where decision-makers adopt a non-cybernetic control process (intuitive or by judgment). According to Hofstede (1981), the latter manifests itself in ambiguous and vague situations and no longer refers to norms. However, the current foundation of performance measurement systems still follows a cybernetic logic.

Again, several theoretical and technical approaches emerge. Newton-Lewis *et al.* (2021) designed a framework that attempts to situate performance management within complex adaptive systems. Furthermore, Lorino (2001) specifies that intellectual cooperation and collective judgment within the organization seem to enhance the relevance and coherence of performance measurement systems.

Nevertheless, all these conceptual and technical attempts to find the relevant tools have allowed organizations to avoid collective bankruptcies. Weick (1993: 633) points out that this bankruptcy is less financial than cognitive. He asserts that the "collapse of sensemaking occurs when people suddenly and deeply feel that the universe is no longer a rational, orderly system. What makes such an episode so shattering is that both the sense of what is occurring and the means to rebuild that sense collapse together". Decision-making based on traditional patterns of rationality is therefore at an impasse.

Even though it inherently reduces reality, simplification promises to save time and money by cutting costs and making the environment more secure. Simplification tends to separate humans from the reality they are supposed to make through their decisions. Morin (1977) explains that simplification expresses the disjunction between separate and closed entities. It inherently drives towards reduction to a simple element and therefore the expulsion of what does not fit into the linear scheme. He adds that knowledge is blind when it is reduced to its sole quantitative dimension and when the economy and business are considered in such a compartmentalized manner.

4. Changing frames to see better?

Management research, and more particularly that relating to PMSs, focuses on the problem of building effective systems in times of crisis as a response to the urgency of the situation in terms of decision-making. The introduction of improvements to the characteristics of the systems representing a tool to make organizations more resilient (Woods, 2006; Graça & Camarinha-Matos, 2016), or even less fragile (Taleb, 2012; Ramezani & Camarinha-Matos, 2019) is also suggested. This focus on the event and its consequences deprives researchers and managers of the opportunity to study the deep origin of a crisis, and to question the functions of the organization that induced this crisis (Roux-Dufort, 2007). A crisis is not triggered by an unexpected event, which is described by Turner (1976) (cited by Roux-Dufort, 2007:108) as a precipitator. This implies that a crisis germinates well before the event, that it spreads over time and that it is dynamic (Roux-Dufort, 2007).

4.1 Revisiting the definition of a crisis

Roux-Dufour (2007:107) notes the lack of consensus on the definition of the concept of crisis due to the conceptual difficulties encountered by researchers within the framework of organization theory. He claims that "these conceptual difficulties are partly due to a monolithic methodological approach that drives researchers to privilege the accidental and dramatic event to understand and explain the crisis". It is this shared vision of the crisis that is privileged in management sciences. The managerial understanding of crisis focuses on the negative consequences of the triggering event, an interpretation which, as Roux-Dufort points out, stems from the very conception of crisis. From a sociological point of view, Mounguengui *et al.* (2011: 4) argue that "this common vision is only possible because the crisis is considered from only one perspective. It points out that something has happened. An unprecedented problematic situation is taking shape in the social universe and no knowledge available from the cultural stock can solve it."

Roux-Dufort (2007: 106) suggests considering the crisis as a sign of organizational transition from one period to another, marking the obsolescence of the past and the seeds of renewal: "being in transition means being simultaneously in the before and in the after". Through this approach to crisis, he reintroduces the largely abandoned complex perspective. The crisis is then perceived as "a process of accumulation of deficiencies and weaknesses rather than as a sudden and extraordinary irruption" (Roux-Dufort, 2007:107). In this same vein, the crisis then appears as "a process comprising elements of destabilization, of disturbances of a certain order (social, cultural, etc.) which tends towards a reorganization and a restructuring to emerge towards a different reality" (Mounguengui *et al*., 2011: 10). The triggering event of the crisis marks the end of one period and the beginning of a new one (Roux-Dufort, 2007). Considered thus, decision-makers can undertake a dynamic of

transformation, where the crisis then turns out to be “the fire that allows such a dynamic because it reveals to consciousness the need for a reinterpretation of the world” (Mounguengui *et al*., 2011: 10).

Hence, organizations directed their focus towards understanding the origin of the failures that led to a breakdown of the managerial tools following an unforeseen situation, where the solutions are unknown, jeopardizing the organizational objectives, in the face of which the power information systems in general and the performance measurement system in particular are altered. This cannot be achieved only internally, since the whole societal framework is not being questioned.

4.2 Rethinking ecology, economy and institution

“let's wake up! ” is how the French sociologist and philosopher Edgar Morin (2022) drew attention to the international community of the need for it to be aware of the challenges of the upheavals affecting the world. In this vein, the French philosopher Bruno Latour (2021), when questioned about the climate crisis, answered that “we are moving forward in a world that we do not know, we must therefore give ourselves the means, a device to describe it”.

As early as 1989, Guattari was denouncing the fact that environmental problems are only managed from their most technocratic aspects. For the French philosopher, environmental ecology cannot be decoupled from two other ecologies, social and mental (the socius and the psyche). The relationship that links the three of them is that of heterogenesis: they are of different natures, but their existence can only be thought of in a permanent relationship. Thus, in response to the scarcity of natural resources, it is essential to respond 'at the same time' to the scarcity of social resources (the capacity to ‘make’ society) and psychological resources (the capacity to think for oneself, to create, to project oneself into the future, etc.). Therefore, there is a need to reconsider the economy’s mission for society.

According to Stiegler and Montévil (2019), a critique of contemporary political economy, that is to say of modern-day capitalism, involves a conceptual rearming of the economy around what Longo and Montévil (2014) call anti-entropy. There, we are not simply dealing with living things, but with organized inorganic matter. According to them, the key lies in reconsidering the knowledge that has become largely diluted into information that is “thoroughly computable and intrinsically entropic” (p.6). Various criticisms addressed at the (neo)liberal economic model, financial capitalism, related to financialization, and the appearance of new forms of capitalism such as cognitive capitalism (Boutang, 2008) testify this evolutionary dynamism that reflects the metamorphosis that the economy is going through, and which has consequences on the behavior of organizations.

Likewise, Yunus (2020), by qualifying the world before Covid 19 as harmful, recalls how the economy is above all "a tool that we must constantly think and rethink until it leads us to the greatest possible common well-being". As such, the evolutionary economist and philosopher Georgescu-Roegen (1979) questions Western economic thought in his work on entropy and thermodynamic theory. He explains that the supporters of this school of thought, whether orthodox or Marxist, describe the economic process as a mechanical movement back and forth between production and consumption in a closed system. However, they obscure the bio-geophysical dimensions of human activity as well as the biosphere on which we depend (Grinevald & Rens, 1995). Moreover, Schumacher (1973) demonstrated that the problem of production from an economic point of view is not solved until economists come to view natural resources as exhaustible. Grinevald and Rens (1995) argue that the bioeconomic perspective is significantly close to the natural philosophy of Gaia theory. Starik (1995) (cited by Ballet & Bazin, 2004) used Latour's concept of "Gaia" and "living planetary system" in proposing an extension of stakeholder theory to non-human participants from a biocentric perspective.

Institutional questioning is also important. The symbolic power of numbers may be greater than that of letters, numbers being considered less polysemous and therefore more universal (Supiot, 2015). They thus created the institutionalization of quantification in so-called modern societies. Indeed, the human being is still trapped in this relationship to the body through counting. The number transforms all qualities into quantities and this is so in all senses of these terms because comparability becomes important in competitive logic. Finally, the quantification of Nature makes it possible to develop specific policies and to intervene in our ecosystems from often distant and externalized "computing centers", which has vast, often unforeseen implications for those who are quantified and metered, and also has a perverse effect on the meters themselves (Mehrpouya, 2021).

5. Discussion

In this paper, our aim was to question and discuss the relevance and paradigmatic legitimacy of traditional PMS and their capacity to grasp the realities of a world characterized by a continuous series of crises. Boyer (2020: 21) highlights the inadequacy of traditional management in the volatile, uncertain, complex and ambiguous world. He explains that "the foundations of traditional management consist of (i) defining a medium or long-term strategy, which has become illusory due to volatility, (ii) controlling risks, which is incompatible with uncertainty, (iii) organize themselves in silos and entrust decisions to hierarchical authority, with the risks to be incurred by entrusting decisions to a single person given the complexity and (iv) adopt a Manichaean, rational and logical mode of reasoning that is unsuitable for ambiguity". Thus, as Libois (2018) points out, reality is, by definition, multifaceted and made up of identities in construction (in Deleuze's sense). Reality can no longer be built on dual conceptions, such as good or bad, right or wrong, positive or negative.

The complexity of the world and organizations and the evolution of thinking today implies the need to work with multiple paradoxes. Morin (1977) insists that simplification does mutilate thoughts and thus leads to mutilating actions. Simplification has also helped to separate the organization from the natural world, which is exclusively viewed as a bundle of natural resources. Unable to act in a certain, simple and linear world, as managers have done until now, there is an urgent need to learn to integrate elements of uncertainty and complexity into managerial systems and therefore performance measurement.

Organizations can no longer conceptualize realities in linear models and then optimize them without embracing the (hidden) externalities and the long-term perspective. Re-learning the land (in Latour's sense) and taking into account the living will help to bridge the gap between awareness and action (Pelluchon, 2020). Massi *et al.* (2018) confirm that stability/certainty are unhelpful for learning. Thus, learning uncertainty and complexity means first of all learning to spot the moments when thinking shuts down, when it falls into dogmatism, into addiction to certainties. This may begin with a shift away from the simplistic linearity of management models towards the repositioning of living beings as central values of managerial action. Morin (1977) shows that knowledge of complexity requires a new approach and a reform of thinking. He presents complex thinking as an understanding of a world that is no longer merely complex but is also made more complex by the layers of interactions created by modern, connected societies.

Several 21st century economists are considering uncertainty and are advocating for shifting away from neoclassical theory, whose models are failing to encapsulate the complex reality. Their attempts are essentially based on two key concepts: regeneration and contribution. Regeneration refers to the idea that economic systems are not static but rather dynamic and constantly evolving. Stiegler (2022)'s concept of regeneration is based on the idea that human beings are fundamentally different from other animals in that they are able to create and transmit knowledge and culture across generations. This ability to transmit knowledge and culture allows humans to accumulate knowledge and build upon the achievements of previous generations, which leads to the development of increasingly complex societies and technologies. Regeneration emphasizes the importance of understanding the underlying processes and mechanisms that would give societies the alternative of the relentless pursuit of profit and growth in capitalist economies. Contribution, on the other hand, emphasizes the role of social and cultural factors in shaping economic behaviour. Economists who focus on contribution argue that economic activity is not just a matter of individual choice but is also shaped by broader social norms, values, and institutions. This perspective highlights the importance of understanding complexity.

According to Morin (2018), complex thinking puts the human back at the heart of a community of destiny ("Homeland Earth") that has been abandoned by the selfish

individual. To increase wealth, global capitalism has operated on the basis of global standardization and conformity, and this has permeated all human activity, including research and positivist epistemologies. Western development in the past two centuries has evolved as a hegemonic model of progress where rationality and science are central values.

Among many other critical scholars, Santos *et al.* (2007: 27) has presented alternative forms of sociability, arguing that "Southern thought confronts the monoculture of modern science with the ecology of knowledges. It is an ecology, because it is based on the recognition of the plurality of heterogeneous knowledge (one of them being modern science) and on the sustained and dynamic interconnections between them without compromising their autonomy". Such an ecology would make it possible to develop innovative, localized theories and concepts on which to base new managerial doxas.

6. Conclusion

Building on the authors of complexity theory (e.g., Morin, 1977; Neely *et al*., 2003; Santos *et al*., 2007; Libois, 2018; Boyer, 2020), we argue, in this article, that a "paradigmatic shift" is necessary to address the challenges of modern societies. Our analysis emphasizes the importance of the third axis of performance measurement, which is cognitive, and calls for a shift away from linear models towards more complex, nuanced approaches. By highlighting the plurality of knowledge systems and the need to integrate living beings at the center of values, we call for performance systems that can overcome the manager's bridles and embrace the complexity of transitioning states.

This article makes two primary contributions. Firstly, it challenges the conventional model of performance assessment and measurement, which is based on mechanistic industrial economics. Secondly, it emphasizes the need to reconsider traditional approaches to performance measurement and management in light of the complex and uncertain nature of the contemporary business landscape, where crises are recurrent and new characteristics are emerging. Overall, our paper calls on performance measurement experts and accounting and finance scholars to question traditional assumptions and to consider more holistic and more innovative approaches to performance measurement and management. For example, it may require them to be more open to diverse perspectives and to collaborate more closely with stakeholders who have different values and priorities. It may also require them to develop new metrics and tools that are better suited to capturing the complexity of economic activity and that prioritize the well-being of individuals and communities.

Artificial Intelligence (AI) can play a significant role in this process. For example, AI can be used to develop new metrics and tools that are better suited to capturing the complexity of economic activity and that prioritize the well-being of individuals and communities. One way that AI can be used in this regard is by analysing large and complex data sets to identify patterns and relationships that may not be apparent to human analysts. This can help to reveal new insights into the factors that drive economic activity and to identify areas where performance can be improved. AI-powered collaboration platforms can also help to connect stakeholders from different sectors and disciplines, allowing them to share knowledge and ideas and to develop shared goals and priorities.

However, there are also limits to what managers can achieve in this regard. For example, they may face constraints imposed by existing organizational structures and cultures, as well as by broader economic and political systems. They may also face resistance from stakeholders who are invested in maintaining the status quo or who do not share their values and priorities. Of course, AI may reinforce existing biases and inequalities if not designed and implemented according to strong value systems.

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