

Tallaki, Mouhcine; Bracci, Enrico

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Article

Risk Perception, Accounting, and Resilience in Public Sector Organizations: A Case Study Analysis

Mouhcine Tallaki and Enrico Bracci *

Department of Economics and Management, University of Ferrara, 44121 Ferrara, Italy; tllmcn@unife.it

* Correspondence: enrico.bracci@unife.it

Abstract: There are various factors that can affect an organization's ability to overcome a crisis and the uncertainties that arise thereafter. Little is known about the process of organizational resilience and the factors that can help or prevent it. In this paper, we analyzed how public sector organizations build resilience/traits of risks awareness, and in doing that, we derived some elements that could affect the process of resilience. In particular, drawing on the conceptual framework proposed by Mallak we analyzed an in-depth case study in a public sector organization (PSO) identifying some contextual dimensions implicated in the process of building resilience. In our analysis, we identified two main elements that affect resilience: Risk perception and the use of accounting. Results shown how risk perception is perceived as a trigger, while accounting is considered as an enforcer in the process of building resilience capacity. The results also show the way accounting is implicated in the management of austerity programs and supporting the creation of a resilient public sector organization. In our case, the risk has become an opportunity for change. In the face of these budget cuts, management began refocusing the company's mission from infrastructure maintenance to providing services with a market-based logic.

Keywords: resilience capacity; cut-back management; crisis



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1. Introduction

The concept of resilience is holistic and complex as it is developed from several perspectives, i.e., organizational, information technology, industrial relation, engineering, business strategy, culture, organizational learning (Andersson et al. 2019). Organizational resilience is defined as the ability to build traits of risk awareness, preference for cooperation agility, and improvisation (Andersson et al. 2019). Organizational resilience is the ability to effectively absorb, develop specific responses to, and engage in transformative activities to capitalize on disruptive surprises that potentially threaten organization survival (Lengnick-Hall et al. 2011). Mainstream literature views resilience in terms of the ability to return to the previous state of perceived 'normality' (engineering perspective) or as the capacity for recovery from crisis by following the sequence of rescue, restoration of damaged infrastructure and then the rebuilding of markets (ecological perspective) (Barbera et al. 2017; Davoudi et al. 2012). According to the ecological perspective organizations could not only persist, but also adapt its structure under the new conditions, and this process implies gradual change as a new business concept may emerge (Dahles and Susilowati 2015). The ecological perspective recognizes the existence of multiple equilibria, and the possibility of systems to flip into alternative stability domains (Davoudi et al. 2012).

The concept of organizational resilience is based, therefore, on the notion that individuals, or a system, can withstand or recover its prior shape after shocks. This concept is described sometimes as a trait, a characteristic, or an outcome of the organization that faced adverse conditions (Carden et al. 2018). However, environmental conditions like financial crises or other external shocks are not sufficient to describe resilience in public sector

organizations. In the public sector, various studies have explored governmental responses to the crisis but fewer studies deal with the managerial consequences of such phenomena for public organizations (Barbera et al. 2017; Tallaki and Bracci 2020). Austerity measures in public sector have focused the role of resilience in the public sector (Barbera et al. 2017; Leslie and Canwell 2010). Nowadays, the main challenges for the public sector is to deliver services in an age of austerity (Bracci et al. 2015; Leslie and Canwell 2010). Boin and Lodge (2016) argue that the time has come for public administration scholars to incorporate crisis and disaster management into the main research agendas of the field. De Aquino and Cardoso (2017) analyze the pattern presented by four Brazilian municipalities at the beginning of a serious revenue downturn, and the authors show that the cases analyzed do not have an anticipatory capacity or long-term strategic planning. The same applied in Greece where it was shown that the municipalities did not demonstrate significant anticipatory capabilities (Cohen and Hlepas 2017). The resilience pattern could be different between municipalities, its depending on how the shock has been perceived (Du Boys 2017) or other characteristics like organizational features and capacities, as well as the characteristics of the external environment (Barbera et al. 2017, 2020). In fact, in other studies, municipalities appeared to be a common set of anticipatory and coping capacities (Jones 2017).

Barbera et al. (2017) call for further studies about the internal and external determinant of resilience in public sector organizations, and in particular the role of accounting in supporting the development of resilience capacity. More recently, Barbera et al. (2020) argued on the need to further investigate how accounting can help public sector organization to change and adapt to crisis and risks. Moving from this gap in the literature, we analyzed how accounting technologies designed and used by public sector organizations can trigger the development of resilience/traits of risks awareness. In doing so, we draw on the conceptual framework defined by (Mallak 1998) and applied it in a case study conducted in a public sector organization (PSO). Results show how risk perception is perceived as a trigger, while accounting is considered as enforcer in the process of resilience. The results also shown the way accounting is implicated in the management of austerity programs and supporting the creation of a resilient organization. In our case, the risk has become an opportunity for change. In the face of these budget cuts, management began refocusing the company's mission from infrastructure maintenance to providing services with a market-based logic. Accounting played different roles in the construction of reality (Burchell et al. 1980; Hines 1988) and in managing uncertainty (Chong and Chong 1997). Accounting provided certain language and discourse that constitute a way of establishing legitimacy in highly ambiguous situations (Nahapiet 1988). We argue that accounting has a role in making public sector organizations more resilient, with relevant policy and managerial implications. To the best of our knowledge, this paper is one of the first attempting to investigate the relationship between accounting technologies, risk awareness, and the development of resilient capacities.

The remainder of the paper is structured as follows: Section 2 describes how to build resilience and the framework used. Section 3 reports the methodology. Section 4 describes the case study and the results emerging. The paper ends with a discussion and some final reflections to highlight the contributions of the paper as well as its limitations.

2. How to Build Resilience: Theoretical Framework

The resilience concept is multifaceted and depends on a variety of dimensions and characteristic (Linnenluecke 2017). In the process of containing external risks, i.e., resilience, organizations may activate three mechanisms (Powley 2009): Alteration of the formal relational structures and opening a temporal space for organization members to form and renew relationships (liminal suspension); awareness of community members of the needs of others (compassionate witnessing); and activation of relational networks across organizational and functional boundaries (relational redundancy). In the same way, organizations can absorb external risks by undergoing first-order change and single-loop learning (labelled resiliency), or they can adopt new practices through second-order change

and double-loop learning (labelled retention) (Meyer 1982). Accordingly, resilience can be planned (anticipatory) and adaptive (coping with). Planned resilience involves the use of existing, predetermined planning capabilities. Adaptive resilience emerges as response to a crisis or other emergent situations (Lee et al. 2013).

Various internal and external factors could therefore support public sector organizations to be resilient, also affecting the professional identity of managers and employees (Barbera et al. 2017). Identifying the determinants of resilience or those internal and external factors makes possible to understand how to make an organization more performant in terms of resilience. This is because, as highlighted by Fraser et al. (1999, p. 136), “If we can understand what helps some people to function well in the context of high adversity, we may be able to incorporate this knowledge into new practice strategies”. Accordingly, organizations need to understand their resilience strengths and weaknesses and must be able to evaluate the effectiveness of resilience strategies (Lee et al. 2013).

Carden et al. (2018) specify that a flexible workforce, not only in skills and job tasks, but also in mindsets could help organizations to survive. Biggs (2011) and Coutu (2002) highlight the importance of human capital, which takes in some of the features of innovation and collaboration, in developing organizational resilience. Meyer (1982) concludes that resilience is influenced by strategy and slacks in resources, ideologies, and by organizational structures. Sutcliffe and Vogus (2003) argue that resilience in organizations depends on broader information processing, loosening of control, and utilization of slack capabilities. Hamel and Välikangas (2003) suggest that innovation is the key for resilience. Another example of resilient organizations was presented by Gittell et al. (2006), whereby the authors highlight the importance of viable business model that allows financial reserves to build resilience in organizations.

In order to address our research question, we draw on Mallak (1998), who defined seven drivers of resilience, namely: Perceive experiences constructively, perform positive adaptive behavior, ensure external resources, expand decision-making boundaries, practice bricolage, develop tolerance for uncertainty, and build virtual rule system (Table 1). *Positive perception of experiences* is essential to the resilient individual because the individual is more likely to be able to solve the problem when he perceives experiences positively. In this case, individual takes an active approach, i.e., *positive adaptive behavior*, toward solving problems in the workplace.

Table 1. Summary of resilience dimensions.

| Principle | Putting the Principle to Work |
|-------------------------------------|---|
| Perceive experiences constructively | Even if the experience causes pain, find the positive angle and move forward. |
| Perform positive adaptive behaviors | Perceive change as opportunity, not danger. Allow responses to adapt to the needs of the situation, rather than execute ineffective “programmed” responses. |
| Ensure adequate external resources | Ensure access to adequate resources to allow positive adaptive response to approach a wide variety of possible events. |
| Expand decision making boundaries | Provide greater decision making authority to support positive adaptive response and the use of resources to achieve the objective. |
| Practice bricolage | Develop the ability to create solutions on the spot using materials on hand. |
| Develop tolerance for uncertainty | Develop the ability to make decisions with less than the desired amount of information. |
| Build virtual role systems | In a team, individuals have a shared understanding of the team’s mission and can fill in wherever needed to ensure smooth functioning of the team. |

Source: Mallak (1998).

Adequate external resources include resources of advice, information, finances, emotional support, and practical help, and this principle works in concert with *expanded decision-making* boundaries to maximize the potential for positive adaptive responses. *Bricolage* is the ability to fashion a solution on the spot using materials on hand; to do that individuals need expanded decision-making authority and access to resources. Regarding *develop tolerance for uncertainty*, the latter refers to situations where the amount of information we need is greater than the information we have. Individuals with this capacity could make good decisions under conditions of uncertainty. *Virtual role* is identified as an advanced form of work team relationships. In this paper, we focused on the framework of [Mallak \(1998\)](#) to analyze, in particular, the role of accounting in supporting public sector organizations to develop risk awareness and become resilient.

3. Research Methodology

The paper adopts a qualitative approach with a longitudinal case study. In doing so, we also respond to the call for more qualitative analyses ([Vaivio 2008](#)) by developing a case study about PSO. We used a mix of primary and secondary sources. We interviewed managers and employees involved in the process under study. We did total of 18 interviews, the average duration of the interviews is equal to 1.44 h (Table 2). All interviews were taped and transcribed. The transcripts were sent to the interviewees to validate and confirm the adherence of the content with their thought and perception.

Table 2. Interviewees by position/duration.

| Interviewees' Role | Duration (In Hour) | Number of Interviews | Number of Interviewees |
|-----------------------------------|--------------------|----------------------|------------------------|
| Managing director | 3.0 h | 2 | 1 |
| CFO | 3.0 h | 2 | 1 |
| Management control manager | 1.5 h | 1 | 1 |
| Human resources manager | 1.2 h | 1 | 1 |
| Manager of strategical investment | 5.8 h | 4 | 4 |
| Maintenance manager | 3.0 h | 2 | 2 |
| Maintenance workers | 5.5 h | 4 | 4 |
| Quality manager | 1.5 h | 1 | 1 |
| Purchasing Manager | 1.5 h | 1 | 1 |
| Total | 26.0 h | 18 | 16 |

Thus, we analyzed and codified the interviews, highlighting the keywords that related to resilience and the way the company reacted to a financial crisis. One of the critical elements in qualitative data analysis is the systematic coding of interviews ([Miles et al. 2014](#)) as it attributes interpreted meaning to each datum that contains references to specific categories of information ([Saldaña 2013](#)). Given the research question and the explorative approach adopted, the code list was an inductive task, based on what respondents said ([Carey et al. 1996](#)).

The interviews were analyzed separately by the authors to reduce subjectivity, and results were compared and discussed to reach a common understanding of the meaning of the interviewees' responses. We also took detailed notes of several informal interviews. These informal interviews allowed us to go back to the original interviews to specify, clarify and ask for additional evidence. We also collected data through direct observation and participation in meetings. We first entered the site in 2014 and started the research in 2015, which allowed us to follow changes over time. We attended various board and management meetings. Furthermore, we had access to all internal and external documentation (minutes, budgets, guidelines, procedures, public documents concerning the sector's data, and the financial situation of the owner).

4. Analysis of Results

The subject of the case study is a PSO that deals with ordinary and extraordinary maintenance of regional government infrastructure and is 100% controlled by the regional government. The company employs some 250 people and has a budget around €19 million (in 2018). Its main source of income is an annual transfer made by the regional government for infrastructure maintenance. Over the last few years, public transfers have fallen by around 35%, or some €5.5 million. The cuts were incremental but the financial performance remained in line with the historical trend. This is because the company has managed to compensate the cut in resources with the development of a new business line.

4.1. Risk Perception

Over the years, the company has managed to overcome the crisis by developing new business opportunities. The perception of risk, as the interviewees pointed out, following the cut of funds, was the trigger that led to a change in the business model. In fact, financial risk intensively affects business environment. Risk perception is linked to uncertainty. The latter is considered as risk when it becomes an object of management (Power 2007). Risk could be distinguished on the basis of the source of risk. Black (2005) reported that internal risks arise within the organization, external risks, instead, arise from the environment in which the organizations operate. The reduction of funds, considered as the source of risk, generated uncertainties regarding the future of the company, as the interviewees pointed out. Various operators said they are worried about the company's future.

Renn (2012) reported that organizations could deal with three different approaches to govern risk: Technocratic risk management approach that focuses on risk minimization; decisionistic risk management that extends the technocratic approach by opening debate to risk evaluation; and transparent risk governance considers the engagement with the nature, perceptions, and contested benefits of risk in complex situations. In the public sector, risk is usually related to technocratic/bureaucratic approach of risk (Brown and Osborne 2013; Power 2007). In our case, the risk has become an opportunity for change. In the face of these budget cuts, management began refocusing the company's mission from infrastructure maintenance to providing services with a market-based logic.

4.2. Building Resilience

In the following sections, we analyze the resilience process according to the various dimensions of Mallak (1998).

✓ Perceive experiences constructively

According to Mallak (1998), an individual is more likely to be able to solve his problem when he perceives experiences positively. Even if the experience causes pain, organizations have to find the positive angle and move forward. This positive perception of change was noted by researchers both in meetings held between various managers and in interviews conducted. Regarding these changes one of the managers of strategic investment said:

I saw the company change the type of mentality and approach to some problems or some processes that were not previously checked or held in particular consideration, this is positive for me . . . the change in mentality allows to go in parallel with market changes.

This orientation to change and the positive perception of changes was also noted by the human resources manager who said:

The desire for learning of the staff seems positive. I think it's a good thing. It also serves us to bring together people from different business realities in order to homogenize. This was done in particular for maintenance personnel of electrical installations and station managers who had different operating modes and sometimes did not understand each other.

The company had a strong predisposition to change and consequently it perceived experiences constructively. With the cutting of resources, the company found itself faced

with a significant financial risk. The proposed solution, and then introduced by the management, concerned the reconversion of the company's mission, that is, from an infrastructure maintenance to a production company with a more market logic. The first two years the cut was not significant and this allowed the company to experiment with the new logic. The adherence to the reconversion, by the staff, was voluntary. The staff involved in this conversion process seem satisfied, as pointed out one by of the maintenance operators: *For me it is a challenge, but the company never leaves you alone.* To motivate the staff involved, an additional production award was given. The accompaniment, the training, and the motivation have had positive results because the rate of adherence to the conversion process has increased through time.

To verify the sustainability of the new business idea the PSO developed a business plan. Various meetings in order to establish the operational objectives and in order to establish the production standards have been carried out. In addition, benchmarking was also done to understand the productivity of similar companies. All of this has been translated into various simulations that have led the company to set productivity goals. In a first phase, the company started with high-level uncertainty of both the objectives and the actions, because there were no clear management and operational objectives, the choice made to convert the staff without having an idea about productivity and therefore on the consequence of the action taken created uncertainty regarding actions. This emerged in the various meetings, in which the researchers also took part, where all responsible were skeptical of the future. However, there were no alternatives, as pointed out by the general manager in various occasions.

✓ *Perform positive adaptive behaviors*

The second principle of resilience defined by [Mallak \(1998\)](#) as the ability of organizations to respond in a positive and adaptive fashion to a wide range of events. Organizations that perform adaptive behaviors take an active approach toward solving problem in workplace. This principle is connected to the first principle of resilience. In fact, organizations that perceive constructively experiences adopt positive adaptive behaviors. This resilience principle focuses on adaptive as opposed to programmed responses. Over the years, the company has shown to have a mentality oriented towards adaptation and change. One of the respondents specified that:

In recent years we are transformed into a modern company. I mean a company with market orientation. A company that has active processes instead of an administrative bandwagon. Along with this, there was a staff rejuvenation process, a very high training process on which a lot was invested. Also, because here there were patchy skills, that is, there were those who knew a lot and those who knew very little. And those who knew did not share information with others.

He added:

The offices were deserted and everything was improvised. Instead, we started hiring young people, people who have a certain kind of vision and preparation. Now there has been a significant change in the management approach.

The company in recent years reviewed all the processes in order to improve their functioning and to reduce inefficiencies in time and costs. The revision of the process has allowed the company to adapt and direct the behavior of the operators in order to obtain the necessary information. The quality manager said that:

We have transformed what were historical procedures not even described in formalized procedures; now we no longer use procedures related to the experience of those who managed but linked to an idea that was translated into a procedure regardless of who was responsible.

In this process, the organizational chart was also revised and new employees were identified as responsible, most of them young or recently employed. This has allowed the company to obtain a logic of responsibility that aimed to direct the behavior of the various

operators. The choice of new younger managers has made it possible to overcome some resistance, in particular among some older ones, as one manager of strategical investment emphasized.

Even at an individual level, the operators try to be adaptable to any problem and to find unplanned solutions. In the event that, for some reason, the material is missing, the maintenance operators do not block the work and try to recover the material from some other abandoned plant. Sometimes even at the last minute the operators change the work program because there is a delay in the delivery of the materials by the suppliers trying to do another activity that does not require the material or for which the material is available. The change in the type of activity was made, for example, even during rainy days. There are activities that must be done outside the company and others that can be done within the company, in the case of bad weather conditions even at the last moment in order to not block and slow down the work operators change program and try to carry out activities within the company. This adaptive behavior to the conditions of the context was also noticed during the working meetings. In one case, for example, of a design error, the project manager identified the error and also highlighted the solution without addressing to external designers. These adaptive behaviors on an individual level have been made in particular to avoid blocking work and respecting company objectives.

✓ *Ensure adequate external resources*

According to [Mallak \(1998\)](#) external resource encompasses resources such as advice, information, finances, emotional support, and practical help. In these years, the company has succeeded in guaranteeing the necessary resources for both the maintenance and the renewal of the railway network. With the cuts in resources, the company was able to convert part of the maintenance staff to carry out the renovation of the railway network. This activity was previously outsourced. The training and the accompaniment with external consultants has allowed the company to have the necessary skills in order to reconvert the staff. This was also possible thanks to the acquisition of the know-how of other companies in the sector (through agreements) or the involvement of external consultants with extensive experience in the sector. This ability to attract and guarantee external resources in terms of advice, information, emotional support, and practical help was accompanied by the adoption of an accounting system that allowed the production of the data necessary for the purpose of formulating to formulate advice, information, emotional support, and practical help. Accounting contributed to formulate advice, information, emotional support, and practical help, and therefore to reduce the uncertainties, i.e., to undertake actions that are no longer inspired but calculated and based on various simulations. In this sense, accounting played a role of “ammunition machine” providing the general manager or other manager with the information needed to support a specific decision.

✓ *Expand decision-making boundaries*

Another principle of resilience is the expansion of decision-making boundaries. According to [Mallak \(1998\)](#) resilient individuals need the ability and authority to make decisions on the spot in a variety of situations. The formalized procedures introduced by the company helped to establish the responsibilities and the flow of authorization with respect to the various activities. In addition, the company monitors the results monthly and every month at least two meetings are held to discuss operational problems. This made it possible to have a shared timeline decision-making system and to expand decision-making boundaries. The presence of a director with managerial and technical skills helped to strengthen decision-making autonomy. As underlined by one manager of strategical investment:

The general director is always present, technically prepared, more oriented to share decisions making and to give the necessary autonomy; He is good manager for this company and other large private companies because he has a mentality that he evaluates you based on what you are doing. Precisely for this reason, I find myself very well.

Furthermore, the sharing of operational objectives, as well as the almost daily support with external consultants, have allowed all operators to be involved and participate in the various decisions making. Their involvement in the decision-making phase allowed the company to make them aware regarding the economic impact. Their involvement has also allowed the reduction of uncertainties with respect to the consequences of the choices made. One of the operators said that:

In my opinion, the new mode of objectives definition has brought much more order. Before, I was not aware of the company objectives. It was a negotiation among executives.

He added:

Now we are strictly interconnected . . . everyone is involved...sharing goals was one of the causes that accelerate this process.

This favored a sense of inter-dependency, dialogue, mutual understanding, and trust. In fact, involving people along the decision-making process allows to sensitize people and to accelerate the decision-making process.

✓ *Practice bricolage*

Bricolage is the ability to fashion a solution on the spot using materials on hand, it refers to the practice of creating order out of whatever materials were available at the time (Mallak 1998). From the analysis of the procedures followed by the operators it has been noticed that in some cases, some operators introduced different tools or procedures that aimed to control or to improve activities. As pointed out by one of the maintenance operators:

Instead of using rag and brush, losing time, I sprayed food degreaser and in the meantime I waited I could do voltage measurement tests. This avoided waste of time and then cleaning the system improves the functionality of the system, other teams did not use food degreaser and therefore lost more time.

The objective of these tools, according to the operators, is to find immediate and inexpensive solutions to some operational or control aspects and to respect the times of work. Another aspect related to this aspect of resilience is for example the reuse and recycling of maintenance material. Once a plant is decommissioned, the operators do not throw away all the material, all the material that can be recovered is put into storage. In these years, for example, with the cutting of resources and personnel reconversion, the company has continued to recover and use the material from the decommissioned plants, this on the one hand has guaranteed financial resources for company and on the one hand has allowed the operation as that material has long delivery times. As pointed out, the objective of using the material recovered from abandoned plants is to speed up the work, solving the practical problems, and therefore to achieve the objectives shared at the company level.

✓ *Develop tolerance for uncertainty*

Uncertainty refers to situations where the amount of information we need is greater than the information we have, and resilient individual has the capacity to make good decisions under these conditions (Mallak 1998). Until a few years ago, the company had public transfers that guaranteed both the ordinary maintenance and the modernization of the network. The uncertainties were almost null because the necessary resources were guaranteed by public transfers. With the cutting of financial resources, the company has started living in an uncertain environment. Currently, most of the revenue (37%) is no longer guaranteed by transfers but depends on the work of the staff. The director says:

It is a challenge that we must face, our survival depends on what we can do; Certainly we do not have the tools to evaluate what will happen in the future but better to prove that stay still waiting the end.

At the company level, from management to operators, the uncertainty of the future has become the order of the day. The planning and monitoring of the results for the purpose of survival has entered everyone's mindset. The use of accounting, as highlighted by various respondents, helped to reduce and manage uncertainty. To verify the sustainability of the new business idea, the PSO developed business plan. To do that, the company carried out an in-depth analysis with respect to the needs and availability of the skills able to accompany the company. This allowed the company to understand the availability of the administrative and technical skills needed to carry out the work and therefore the feasibility of the operation. In this phase, the business plan contributed to rationalize the process and thus reduce uncertainty. Considering the high level of uncertainty, the decision was made in some way by inspiration. Various simulations made allowed first of all to rationalize the process and secondly to legitimize the choice towards the public partner. Then, the business plan gave an appearance of feasibility of the new activity. Referring to the business plan, the management control manager stated that:

We knew that objectives of the business plan were challenging ... The business plan made us believe we could make it.

At the same time, the budget role and function changed significantly, from a traditional public sector approach, where the budget is commitment based, with a high degree of certainty in particular for the revenues, to a managerial approach with uncertainty of revenues. As such, the accounting system, on the one hand, has rationalized and legitimized the process of resilience.

✓ *Build virtual role systems*

The virtual role system refers to an advanced form of work team relationships. Resilient individual can operate in a virtual role systems environment; when many people in the organization are effective in this systems, the organization becomes more resilient. The virtual role system provides a work environment where the team can continue in the absence of one or more members (Mallak 1998). The review of the various processes and of the formalization of the various procedures allowed the creation of a coordinated system among the various company structures. The introduction of a new ERP helped to unify both the procedures and the language between the operators. The review of the organization chart, the assignment of responsibilities, and the implementation of a performance-based incentive system contributed to involve all stakeholders in the change process. Moreover, the training, also technical for the administrators, allowed the staff to have a broader vision with respect to the company. Having written and formalized the various activities and roles and having introduced ERP that gives a cross-sectional view of the whole company, the roles have become interchangeable and consequently the team can continue in the absence of one or more members. The various activities were mapped, described, and standard working times were defined. In the mapping of the various operational activities, the company has given an overall view to the various operators regarding the work to be done helping to complete the virtual system. This virtual system was also concretized at the operational level, getting the operators to alternate with respect to the activities. With this logic, the company has created workers with a broad vision and has been able to create a virtual system that has served in subsequent years.

5. Discussion

Barbera et al. (2017) highlighted that organizations could respond by self-regulation, by constrained or reactive adaptation, or by contented or powerless fatalism. Renn (2012) reported that organizations could deal with three different approaches to govern risk: Technocratic risk management, decisionistic risk management, and transparent risk governance. In our case, the perception of risk has become an opportunity for change. In the face of these budget cuts, management began refocusing the company's mission from infrastructure maintenance to providing services with a market-based logic. In the case analyzed, the management adopted the transparent risk approach (Renn 2012), and in doing that, they

adopted the reactive approach of resilience (Barbera et al. 2017) by generating benefits from the situation.

The case portrays a vivid picture of the role of accounting in supporting the development of resilient capacities. In particular, the adoption of tools like a business plan, budget, and other accounting technologies creates a particular realm of calculation with which judgements and decisions were made. In this sense, accounting rationalized and legitimized the process of resilience. Accounting contributed to formulate advice, information, emotional support, and practical help and therefore to reduce the uncertainties. Accordingly, accounting has given the company the basis for decisions ((Hopwood 1990, 1992; Miller and O'Leary 2019). Decision making and judgement requires ability to interpret the context.

Accounting practices offered a way of making things real, constructing seemingly objective and neutral records for abstract and complex (Hopwood 1990, 1992; Miller and O'Leary 2019), and this helped the case-organization to develop resilient capacities. It also helped to encourage interaction between various company areas and allowed to create a common language and favor the interaction between participants who do not usually operate in the same context (Lai et al. 2014). This is because accounting can influence perceptions, change language, and infuse dialogue (Hopwood 1990). In fact, the way in which the objectives were defined and checked made it possible to create communication channels between various operators. This certainly helped create interconnections and common language between the various structures and contributed to make the company resilient.

Another role of accounting in the resilience process has concerned the reduction of uncertainty to developing tolerance for uncertainty. The information perceived to be important by decision-makers are related to perceived environmental uncertainty (Gordon and Narayanan 1984). Accounting helped the management to reduce uncertainty and to improve decision making (Gul and Chia 1994). Our study shows how the development of resilient capacity goes through the management risk awareness supported by the existing and newly designed accounting systems. As observed above, in the case-organization the business plan, as an example of newly developed accounting tool, supported the formalization of risks and the management of the opportunities of the changing environment to anticipate and cope with the external shock.

6. Conclusions

In this paper, we investigate the process of building resilience capacities. We highlighted how risk perception could be the trigger for this process, and the role of accounting. Organizations facing financial crisis could respond differently. In particular, drawing on Mallak (1998), we investigated the linkages between risk perceptions, accounting, and the emergence of resilience capacities.

The paper contributions are two-fold. Firstly, our analysis reveals that Mallak's framework is adequate in order to understand how resilience is built, and can therefore represent a point of reference for future studies. Second, the paper is one of the first attempting to show how accounting is implicated in making public sector organization resilient and its relationship with the risk awareness. During financial shock, public sector organizations face high level of uncertainties, both in terms of objectives to be pursued and the means through which achieve them. As the case shows, accounting in such contexts can support the organizational resilience by providing the legitimation of choices, thanks to the rational representation of uncertain objects. Furthermore, accounting support adaptive behavior by providing knowledge and ready to use answers. During financial shocks, the role of accounting need to be understood in a dynamic perspective. Whereas at the beginning of the financial shock, accounting plays a role as rationalization machine, during the implementation process of the solutions to cope or exploit the crisis, the accounting technologies' role change, supporting the organization more as an answer machine (Burchell et al. 1980). This conclusion is supportive of Mouritsen and Kreiner (2016) view that accounting sup-

port decisions not by solidifying decision but with a continuous process of decision “from causality to effectuation and from solutions to generation of alternatives” (p. 21). As such, a resilient organization is supported by accounting assuming multifaceted role not for the search of a new equilibrium but to continuously adapt to the uncertain internal and external environment (Barbera et al. 2020).

The results have both policy and managerial implications. From a policy perspectives, austerity and cut-back policy measures need to be planned supporting public sector organizations to develop resilient capacities. As we have shown in the case study, budget cut-back triggered organizational innovation and change, mobilizing the resilient capacities available. From a managerial perspective, public managers need to pay attention to the way accounting technologies are used throughout the organization. Accounting can play several roles, but that will be dependent on the way accounting is designed and developed. Future studies may be interested in studying the role of accounting versus other dimensions of resilience and understanding how accounting can affect performance in a resilience process.

This study is not without limitations. First and foremost, we based our analysis on one in-depth case study, therefore the results cannot be generalized in different contexts. Second, we observed the case analysis during a discrete point of time. As the development of resilient capacities takes time, a more longitudinal study would help in understanding more clearly the dynamics of resilience. Future studies can address the above limitations by extending the depth and length of analysis to corroborate, extend and amend our findings.

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