IOSR Journal of Business and Management (IOSR-JBM)
e-ISSN: 2278-487X, p-ISSN: 2319-7668. Volume 22, Issue 7. Ser. VII (July 2020), PP 46-55
www.iosrjournals.org

The present situation of risk management implementationin Comorian small and medium-sized enterprises

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Abstract: *Enterprise Risk Management (ERM) designates a comprehensive risk management approach, which proposes that all the risks involved in a company's value creation process be systematically taken into consideration. In the case of Comorian's SEM we are yet to understand the difficulty of implementing this system, which handicap their development and the good decision making process of the managers. To resolve this problem inherent in traditional risk management methodologies in which many SME from developing countries operate, we investigated a set of difficulties for the implementation of risk management in small and medium-sized enterprises (SME) of Comoros. In this regard a set of 12 variables was presented and analyzed through SPSS by usingPrincipal Component Analysis (PCA) with the ultimate goal of designing a scales that will compute latent constructs with a main objective of determining the difficulty variables related to the implementation of risk management, and the result highlighted* ***theimplementation of suitable tools and process for risk management*** *and* ***The establishment of an adequate risk management culture*** *the 2 variables to focus on. This analysis also gives us insight into the awareness of the challenges that have an impact on the implementation of risk management in SMEs. It also contributed to the return of information on the risk management matter that was undiscovered in the scope of the Comorian SMEs.*

Key words: *Risk Management, Small and Medium-sized Enterprise, Risk Implementation, Decision making, Principal Component Analysis.*

Date of Submission: 13-07-2020 Date of Acceptance: 28-07-2020

I. Risk related to small and medium-sized enterprises

Although less complex to the investigation in big organization or large-scale projects, the environmental and social problems related to SME can be major. It mainly concerns the well-being of workers. These problems are not always rigorously monitor and the risks vary according to the magnitude of the company, its ability to manage environmental and social risks, its sector of activity and its location.

Risk management is gaining ground in SME. But the magnitude on the task still discourages some. Simple solutions however exist to better integrate this issue.

If the risk culture gradually tends to take hold in medium-sized Comorian companies, the room for improvement is still substantial, while disparities persist.

According to the literature, two third of SMEs say they do not fully control the dangers hanging over them. And for good reason: only 1 in 8 has integrated a global risk management approach. This is especially the case for companies with more than 50 employees and in the finance sector. For the little ones, the challenge is more difficult to take up. In the latter, the majority of decision-makers recognize the magnitude of the task to be accomplished and note that the culture of risk is not really rooted in their organization.

And yet, the majority of them consider risk management as a critical issue for their business. To them, it is even one of the main factors of competitiveness, on a par with innovation and R&D.

This discipline is more crucial since for the majority of respondents, the threats have stagnated or increased in the last few years. According to the barometer of emerging risks established by the "chamber de commerce", technological risk, which includes data loss and business interruptions due to a system failure, came first among the concerns of risk managers. Followed by two others: supply chain, finance and logistics risk, and regulatory and non-compliance risk. Lately, the sources of concern evolved. Among the main ones are human risks (accidents at work, illness, recruitment difficulties) and market risks (competition, pressure on margins), which remain the most feared.

Among the reasons for this discrepancy between ambition and taking action within SMEs, come first: lack of time and resources, the costs of implementing changes or improvements, the difficulty in passing on changes in the organization.

It must be said that it is not easy to incorporate a risk management strategy in the Organization. It is as costly as time consuming and requires reliable experience.

II. The need and adoptation of risk management in SME

Enterprise Risk Management's main aim is to build confidence and help develop value for the owners. To fulfill it, better understanding and utilization of company resources is needed. Risk management also assists in making decisions by identifying sectors that need more attention and propose mechanism structureto remedy them. Enterprise risk management is often intended to help create trust with customers by looking at the business processes of the enterprise to detect possible dysfunctions or sensitive activities in relation to key business objectives.

A real risk management strategy provides some benefits for the organization. Nevertheless, according to the COSO report, the implementation of corporate risk management can bring a number of benefits. Risk management allows to identify "the overall level of risk a company agrees to take to fulfill its value creation objective." This risk tolerance has to be taken into consideration when determining the basic strategy as long as the outcome have is on the same direction as the risk inclination of the organization. Hence, the management of risk add value to the organization evaluation a plan that suits the risk profile of the company. A connection is therefore formed among the development, the risks and its outcome then lets the organization to define, evaluate and determine appropriate degrees' steadythroughout the objectives of the business. It means that managing risk is indeed going via a method of recognition but also a risk evaluation. As risks can be different, they can begrouped between financial, organizational, technical and regulatory. K. Lajili and D. Zéghal (2005) makes a distinction between several risks groups, and that when established, they have to be evaluated on 2 sets: likelihood of happening and the effect if one happens. The effect can then be measured by different factors: fiscal andsocial impact on company. Score is usually mostly utilized on a form scale: small / moderate / high. The arrangement of the standard "probability of occurrence" and the standard "impact" grants the risk being considered a given an overall ranking. Therefore, risk management gives a greatawareness and perception on the impact of risk in when occur. Afterward the identification and evaluation of risks, management should then implement an acceptable approach between the foregoing five techniques: avoidance, mitigation, impact reduction, allocating and risk acceptance. The selection of a strategy involves a quantification of the cost / benefit ratio of each alternative strategy. Thus risk management better guides the capital needs and their optimal distribution due to the accuracy of the knowledge that it provides. Both of these arguments are in favor of embracing advanced enterprise risk management.

Resulting from ISO 31000 (2009) and COSO (2004) rapport, both updated in 2018 and2017respectively, institutions now have a comprehensive guide to implementing and tailoring the risk management model. Under these principles, the former Enterprise Risk Management (ERM) model of COSO has been developed as a model that can be used in various environments around the world. The guidance demonstrated a cube-shaped model. Which was intended to illustrate the link between goals and components, representing what is required to reach those targets. The third dimension, that also reflects the units of the organization, highlights the model's ability to focus on both parts of the enterprise and the whole. While the latter describes a group of components promoting and sustaining risk management in an enterprise (ISO 31000,2018). To be more specific, it highlights six different areas that summarize the framework: *Leadership and communication, Integration, Design, Implementation, Evaluation and Improvement*. This framework comes with guidelines on risk management in the organization; its application can be customized to fit any type of enterprise and context. With a common approach to manage any type of risk throughout the life of the enterprise and help the decision-making at all levels.

III. Organizational framework for risk management

This move encompasses the organization's culture and heart, particularly with respect to credibility, moral values, and the manner all employees understand risks. This also calls for a specific description of the players' roles as well as the goals to be met so that management can recognize future incidents that will possibly impact their application. Finally, this phase foreseesa creation of the appropriate knowledge procedure that will allow the distribution of risk awareness on a hierarchical and transversal way internally.

Risk identification

It is the job of the organization to recognize both internally and externally incidents that are likely to impact achieving the set goals. Economic, social, environmental and political are probably the major external events, while internal accidents refer to a variety of factors like infrastructure, personnel, processes and technologies (COSO, 2004). Such events are inventoried on the foundation of numerous methods, specifically brainstorming, regular risk analysis or even the Delphi process. (Rodrigues-da-Silva & Crispim, 2014).

Risk analysis

Management continues to its analysis based on practical and theoretical approaches (quantitative and qualitative), after having defined the risks faced by the company. This analysis involves assessing the likelihood

of risk occurrence and its relative impacts, which could be fiscal, social, lawful or reputational. Executives then create then refine a risk chart in a form of occurrence matrix effect / likelihood. It displays the representation of its own load of the risks. The goal of this process is to allow managers generate ideas and make strategic decisions in order to effectively handle the defined risks and meet the organization's objectives.

Risk treatment

Once the risks have been identified and assessed, management is called upon to evaluate the treatment options suitable to the organization's risk specified tolerance and appetite baseline. Such treatment options are based according to COSO, on avoidance, mitigation, impact reduction, allocating and risk acceptance. Avoidance consists in stopping a risk-causing operation, precisely by cutting, stopping or slowing the scheduledoperation. Reduction allows for action and strategies putting in place measures to decrease it likelihood and effects. Allocating, on the other hand, includes risk transfer through the use of other strategies, in particular the procurement of insurance policies, liquidity operations and relocation of aplan. Lastly, while acceptance is to tolerate if the impact of managing the threat is not costly enough and forces a company to accept it and let it to alter its possibility or effect.

Risk monitoring and control

its preform through ongoing or schedule assessments, it makes easier to analyze key risks and benefits lessons learnt from the organization's past experience. It also allows for guaranteeing that the different services the company needs have been successfully enforced. It also checks whether the dataneeded for the operationsseized and transmitted in a timeframe manner to permits everyone to accomplish their duties. Throughout this context, management demonstrates that risk management is not a linear mechanism where one task only impacts another. It is an adaptive mechanism in which each step ultimately affects the others (IFACI et al., 2005).

As a business owner or executive, we need to make sure that our employees and teams plan, execute, organize and control this steps and integrate EMR to their work. This is why creating, implementing and adjusting one or more processes is one of the biggest responsibilities.

IV. From the reflection to the evaluation of a process

This structure can be used as a simplified reference framework. A specific study is always necessary if we are to prioritize the various operations, describe, evaluate and optimize the operational processes.

From this model, it become easier to identify the operations which can be the object of a process and to integrate these possibilities naturally in the organization. This model can be applied to all companies regardless of industry.

If we do not adopt the idea of process in the organization, then entrepreneurs run the risk of unnecessary customization and too high operational costs, as well as longer lead times. All this will inevitably be reflected on the end customer of the company.Worse, they may not get the expected return on their investments (financial, human, time) because of the missed opportunities to increase productivity and responsiveness.During hours of interview and residence, entrepreneurs, managers and business owner highlight four phases that must be taking account during this process, sadly many of our local SMEs trend to skip them.

Reflection phase.

Identification of needs, establishment of operations inventory, analysis of possibilities for increasing productivity, improving customer service, and other opportunities to increase revenues.Documented processes are useful not only for creating operational excellence, but also for training new employees and integrating ways of doing things that would otherwise be lost through staff turnover.From experience, this initial phase offers excellent results when there is a priority approach focused on improving productivity, that is to say the ability to do more with the same resources. Efficiency, doing more with less (time, money, resources) is another positive consequence. This approach allows for a better distribution of resources, which indirectly improves customer service and therefore, revenue growth.The reflection on the various documents of the type "Business Case" and the proposals in the conduct of the business can give ideas allowing to implement new processes.If these initial reflections are made with a vision focused on the medium and long term, then the financial results are constant and predictable over the same time. However, for lasting results, the short term will have to be sacrificed.

Creation phase.

Based on planned or already existing workflows, establish the sequence of tasks, what can be done, by whom, when, where, under what conditions, and always provide exceptions to the process.Creating a process is not an objective in itself. All we need is a process that is easy to explain, easy to understand, logical and practical.Second, a process must be followed in a majority of situations, but that respect should not be

ridiculously rigid in the case of exceptional situations either. As paradoxical as it may seem, a well-designed process has the functionality and the criteria for not respecting it. This is the "agility" part even if the operational framework is well structured at the base.

In the end, an efficient process is not only a sequence of tasks to be executed, but also a very powerful tool that allows the optimization of operations and the various investments in time, resources and money.The need for a process is explained by the significant technological changes that initially appeared in the developpement phase. The economical transformation with the companies' emergence active mainly in the services or technology sector, may have wrongly led to believe that processes would no longer be necessary in the management of operations. However, even a local business needs well-designed processes in order to optimize the management of its operations.

In my opinion, the success of a business depends on operational excellence first, then on the ability to bring together the different types of technical skills, and real teamwork, even in the case where employees are located in distance. If a company wants to succeed in today's business world, then it will need to know how to work effectively. All of this can be achieved through a process.

Implementation phase.

Adjustments are always necessary during the implementation phase and the next evolutionary phase. These patches are an integral part of the standard operating process with the best compliance, adoption and success rates. The ideal time to do this is not sequential, just after the creation phase. Ideally, doing the implementation in parallel with the creation and the next phase of adjustment to realities on the ground is recommended.The greatest benefits are obtained by starting as soon as possible, as soon as the moment is felt, but it is not too late if you can clarify, formalize and document the various ways of doing things that already exist.The implementation of a process is no longer reserved for senior executives or directors.

It is important to understand that even mid-level employees can propose and implement new ways of working that are part of their overall business strategy.Likewise, even the smallest level of collaborator can bring a lot if they have the ability to understand how their work interacts with other departments and fits into the whole company. Such a collaborator can help create something bigger than the sum of each individual job.

The diverse collaborators of a company can also come up with new ideas, rather than only carrying out what is given to them by the higher hierarchical levels.In my opinion, companies should develop this listening capacity, whether through meetings, unscheduled visits, conversations, data analysis or even out consultence.

This ability should not be limited to a few hierarchical levels and pompous titles. It is enough to overcome the natural fear of "losing power". Besides, a real leader, and not the self-proclaimed one, encourages and accompanies all good initiatives, even those coming from a lower hierarchical level than his.The companies that manage to survive in a changing economy like today's are precisely those that accept that all employees have a role to play and have the capacity to solve operational or process problems that they have been able to identify at their level.

Evolutionary phase.

A process evolves and adapts to needs. Any new data and experience can add elements to improve the initial process. Eliminating waste must remain a constant priority. More and more customers are choosing companies that can provide a predictable and satisfying customer experience, even when there is a problem. This is why the basic processes must guarantee that the majority of situations are covered as soon as possible and at the fair price for both the company and the customer. For example, if the payment for a service or product is not done correctly, a process would identify and correct it quickly. In the case of a defective product or insufficient service, the customer expects a quick resolution of his problem. Any manufacturing or delivery problems must be communicated and corrected.

A case-by-case management of these types of situations would not be effective, because for the end customer, there is nothing worse than a company that panics and multiplies errors. Even with a well-designed and beautifully implemented process, there will still be the need for individual management for non-standard cases. Depending on the case, any new experience can add elements to improve the initial process. The management of these process changes must ensure that any additions have a real justification, are well documented, and that they do not add unnecessary complexity. Likewise, eliminating waste (resources, steps, tasks) must remain a constant priority. This optimization can be done with methods like "lean" or "six sigma". These methods are not limited to the manufacturing sector alone, but also to services. A process, through its scalable capacity, not only increases the quality of operations and the well-being of teams, but also reduces time and costs, while delivering a superior customer experience. In the end, everyone wins: the company, the employees, the customers.

V. Methodology and Analysis

Although SMEs represent the large part of companies in Comoros, rare are studies on entrepreneurship and SMEs, and nearly none are studies that target the implementation of managing risk on SMEs. In addition, the heterogeneity of the work poses a considerable problem. The results are obtained on different scales of analysis (for example, the region, the island) using quantitative or qualitative approaches. It's therefore problematic to study the different results of previous Comorian and international research. More than that, insufficient cases study or a limited research area limits the comparison and the validity of the results. The main reason, mentioned with the lack of literature, is the lack of statistical sources in most Comorian industrialists. Paradoxically, even if public statistical sources produced by the government and private party exist in the Comoros, there is only a very limited number of quantitative, empirical works, which are interested in risk management in SMEs. This highlights the strong need and motivation for study on this subject. The subject of this work is crossed by the concern for studying the importance and role of risk management in SMEs in the Comoros, in particular with regard to the factors linked to facilitate its implementation.

Methodological framework

During this research a mixed method was use, with the purpose to identify key difficulties in the implementation of risk management in SMEs in Comoros. The results of this study can then be used to establish a new measuring method to improve risk management for small and medium sized businesses. Due the inefficiency of neither quantitative nor qualitative method alone, the study was conducted on the mixed of quantitative and qualitative method through a literature review, questionnaire and semi-interviews.

To achieve the desired objective in this study, one requires to follow a methodology framework. Therefor this study was carry out via a survey through these specificities.

- ✓ Questionnaire development process
- ✓ Formulation of the questions
- ✓ Questionnaire administration mode
- ✓ Questionnaire content
- ✓ Sample chosen

The questionnaire development process

The development of our questionnaire was done in the context of compliance with the rules established in this area. This development took place in two stages, firstly and before administering the questionnaire in its quantitative phase, we submitted our questionnaire to a preliminary qualitative phase.

This involved testing this questionnaire with ten small and medium-sized companies. This test allowed us to detect first the questions poorly formulated and which lend to an ambiguity, then to make sure that the questions perfectly meet the objectives that we set ourselves at the start and finally to examine the reliability of the questionnaire and validate the understanding of the questions, the completeness of the response methods, the consistency of the sequence. Secondly and following this pre-investigation, we opted for changes in the wording of certain questions and the deletion of certain others which prove to be useless.

Question Formulation Technique

Conducting a survey requires choosing the type of questions. whatever the form of these questions (closed, open or mixed), they must be easily understandable, stimulating and precise. We opted for a formulation of questions that are clear, simple, understandable and consistent so that the interviewees provide us with all the information we are looking for in order to deal with our problem, and collect necessary information to reach our objectives. As part of our survey, we opted for closed questions in order to channel the survey, to make it easier for respondents and not to go beyond the scope of the research.

Methods of administering the questionnaire

Administering the questionnaire involves sending the questions to the people in the sample that you want to interview and then collecting the answers. In terms of surveys, there are three main modes of taking a questionnaire: by direct contact with the interviewer - interviewee or face to face, by telephone and by self-administration. The choice of administration method will have consequences not only on the structure of the questionnaire but also on the scale, precision and excellence of the responses.

To have a high rate of basic information collection and therefore a high response to our questionnaire, we opted for direct interviewer-interviewee contact, which has various advantages, notably interaction with respondents and more in-depth information gathering. and more informal to analyze the results.

Content of the questionnaire

Based on existing literature, the questionnaire was developed based on variables to determine the challenges in the implementation of risk management. This offered an opportunity to explain the nature of the findings of the literature review and discuss information behind the key issues.

The questionnaire is presented in an order that respects the risk management system stipulated by the ISO 31000 standard. It included risks identified by the companies surveyed just as good as the steps relating to the implementation of managing risk process. The groups questions are relating to risk management implementation strategy and its dificulty, and questions on the common risk categories within small and medium-sized enterprises. These questions were scale on 5 point from "not important at all" to "very important"; "not involved at all" to "highly involved". The finding to this investigation will be subject to a frequency analysis to describe the steps relating to the risk management implementation system as adopted in a sample of Comorians SMEs.

Sampling

The choice of a sample, the central element which determines the success of the study, is made on the basis of two main categories of sampling or sampling methods:

Probabilistic methods where the sampling is done according to the laws of chance, that is to say, each individual has the same probability (different from zero) of within the sample.

Non-probabilistic or random methods, known as empirical methods, where the sample is constituted by a rational choice to make the sample identical to its population.

Due to the difficulties in applying probabilistic methods our sample falls under the category of non-probabilistic samples.

It would be pretentious on our part to want to conduct our survey with a representative sample of SMEs. Indeed, the search for the representativeness of SMEs is a very difficult or even impossible task for two reasons:

a) For a sample to be truly representative, it must also be geographically. However, the determination of a geographically representative sample faces major difficulties.

b) The sectoral distribution is also an element that must be taken into account so that the sample is representative. However, in the absence of exhaustive statistics, not only for SMEs but also by sector of activity, it is practically difficult to claim sectoral representativeness for our sample. This lack of official SME statistics is accentuated by the preponderance of the informal sector, particularly in the SME category.

Consequently, the search for representativeness is a difficult constraint to satisfy. This notion of representativeness must be replaced by a broader notion, that of the adequacy of the sample for the purposes pursued.Since we could not constitute a representative sample in the strict sense of the term, we opted for the determination of an acceptable sample adapted to the needs of our research.To this end, the criteria that have been used to define all of the SMEs making up the basic population are: the activity sector, legal forms and geographical location. On the basis of these criteria and the method of administration of our questionnaire, we decided to contact 97 SMEs drawn at random from the mother population but all working in the field of industry, service and trade.

VI. Statistical analysis

It is by electronic mean that we collected the questionnaire responses. We then processed to clean it through Microsoft excel. The main analysis was conducted via SPSS, with a focus on the determination of its factors analysis. At this end we conducted this study by adopting the nest steps:

Assessment of the suitability of the data for factor analysis

We based our analysis on the work of Rostami Ali et al. (2015), where 12 variables of difficulties were as display:

(1) Lack of managerial information and/or background related to the process of managing risk; (2) The need to adopt appropriate processes for risk management; (3) Lack of financial commitment on training and IT; (4)Intangible benefits; (5) Low degree of mandatory for risk management process; (6) The establishment of an adequate risk management culture; (7) The implementation of suitable tools and process for risk management; (8) Time efficacy; (9) Cost efficacy; (10) Strong Worker turnover; (11) Shortage of experienced personnel; (12) Dependency on few key persons / Personal ownerships .

As recommended in SPSS we run the analysis to determine the correlation matrix, which highlight significant amount of coefficients equal and above 0.3. We then determine the Kaiser-Meyer-Olkin (KMO) and the Bartlett's test of Sphericity in Table1. From this results we establish that the data comply with the assuming factor analysis.

Table1: Kaiser-Meyer-Olkin (KMO) and the Bartlett's test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.831
Bartlett's Test of Sphericity	Approx. Chi-Square	619.398
	df	66
	Sig.	.000

Factor extraction

There are two factor extraction approaches, which are based on basic theoretical criteria concerning the components of the overall variance of the number of variables in the study: *Common Factor Analysis (CFA)*and *Principal Component Analysis (PCA).*

The CFA is often use when the author is looking for the latent variable or the structure underlie the variables. It focusses on the analyze variables that share a common variance. However, due its many limitations, its application to many cases is somehow difficult.

The PCA however, focus on an explicit variance of the items and ease the extraction of least possible factors that illustrate and clarify more of the specific variance as much as possible. This is usually the preferred method.

Once the method has been chosen, which is the PCA, then the number of factor is determine. In this study, we include three techniques to determine these factors.

a) Kaiser's criterion (Kaiser, 1960)

This Kaiser's criterion also so-called eigenvalue value is the most widely used criterion. The greater original eigenvalue, the more the factor illustrate the important portion of the total variance. Any factor with an initially eigenvalue greater than 1 is regarded by definition to be an important factor. The SPSS findings displays 4 factors with an initial eigenvalue higher than or equal to 1 as display in table2.

Table2: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	3.930	32.752	32.752	3.930	32.752	32.752	3.197
2	2.287	19.060	51.812	2.287	19.060	51.812	2.224
3	1.122	9.352	61.163	1.122	9.352	61.163	1.853
4	1.053	8.773	69.937	1.053	8.773	69.937	1.118
5	.967	8.056	77.993				
6	.622	5.181	83.174				
7	.573	4.772	87.947				
8	.409	3.409	91.355				
9	.359	2.992	94.347				
10	.318	2.649	96.997				
11	.229	1.907	98.904				
12	.132	1.096	100.000				

b) Scree-plot test (Cattell, 1966)

Cattell's test is a more severe criterion to find factors. It is possible to ask in this options associated with the PCA to make a graph from the eigenvalues. Where all the points represent the eigenvalues of the components, are connected by a line. Only the factors that are before the abrupt change in the slope are retained, in this case 2 of them. The points following this change, called scree, appear to form a straight line. The information added by the factors represented by these points is not very relevant as shown in figure1.

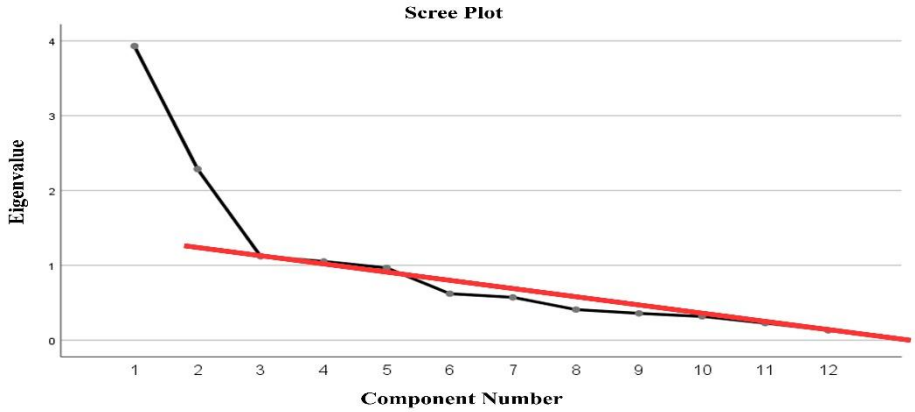

Figure1 Scree-plot
(**Source** author)

c) parallel analysis (Horn, 1965)

So far, to calculate the set of factor to use, we have used both Cattell's (1966) scree test also known as the elbow rule and Kaiser's criterion. Horn (1965) uses a completely different logic from that of Kaiser and Cattell. He suggests that an aspect which can explain a certain proportion of variance can be discovered by chance, starting from data generated entirely at random and for which no real dimension exists. This variance obtain by pure luck, could therefore been use as a comparison element in order to help us decide if the variance that we determine in our study is critically greater than that observable in the matrix data by a random generation.

Parallel analysis therefore consists in carrying out a Principal Component Analysis on the matrix of correlation randomly created yet comprising the exact number of items as the work that we carry out. The decreasing of eigenvalues set calculated on these arbitrary values will then be compared with the eigenvalues computed on real data. If a component is really relevant for our analysis, its associated eigenvalue should be significantly greater than that obtained on the random data. Horn then proposes to retain only the items with variances undoubtedly greater than those procure by pure chance.

To illustrate all this, we will use the eigenvalues obtained in our guide illustrated on the PCA through SPSS. The study in this section has 12 variables, 97 participants and 1000 sets of random numbers. To generate the random eigenvalues, we used the syntax in SPSS by Brian O'Connor (2000) to generate random number. Table3 presents the 2 sets of eigenvalues from raw data and random data.

Table3 Actual Eigenvalues from PCA and Criterion Values from Parallel Analysis Comparison's

components	Eigenvalues for the raw data	Eigenvalues from the random data	Decision
1	3.930	1.765779	Accept
2	2.287	1.566826	Accept
3	1.122	1.407632	Reject
4	1.053	1.286859	Reject

We observe that only two of our eigenvalues are significantly larger than those randomly generated. We will then retrain for the PCA, the 2 factor associated with these eigenvalues.

In conclusion for the factor extraction 3 methods were use: Kaiser's criterion approach where 4 factors were extracted with cumulative of 69.94%, Scree-plot test also known as the Cattell's test where 2 factors extracted with cumulative of 51.8%, and the Parallel Analysis of Horn give us 2 factors with cumulative of 51.8%

Factor rotation and interpretation.

Interpreting the factors or components involves determining the combination of items with a strong connection to one and other with a significant factors. To do this, we suggest the following steps.

a) Examination of the matrix of the components (without rotation)

This matrix contains the weights of the variables on each factor. These weights are in fact the correlation between the variable and the factor, table4. They are used to interpret the role of each variable in the definition of each factor. They therefore indicate the degree of correspondence between the item and the factor. The stronger the load, the more the item is representative of the factor.

In general, the first factor extracted is the one that explains the most variance and is therefore the best possible combination of variables. The other factors have less residual variance to explain. Consequently, They represent less and less optimal combinations, until the variance to be explained disappears.

Although interesting, this matrix is not the most telling in terms of interpretation. In almost all cases, the rotation of factor seem necessary to simplify the correlational matrix between the factors and the variables. Nonetheless table4 show that 4 items are to be orderly considerate: *Time efficacy, the establishment of an adequate risk management culture,the need to adopt appropriate processes for risk management and Lack of managerial information and/or background related to the process of managing risk*.

Table4 Component Matrix[a]

	Component		Rank
	1	2	
Lack of managerial information and/or background related to the process of managing risk	0.690	0.367	4
The need to adopt appropriate processes for risk management	0.382	0.646	
Lack of financial commitment on training and IT	0.587	0.454	
Intangible benefits	0.562	0.518	
Low degree of mandatory for risk management process	0.601	0.533	
The establishment of an adequate risk management culture	0.716	-0.401	2
The implementation of suitable tools and process for risk management	0.707	-0.465	3
Time efficacy	0.724	-0.370	1
Cost efficacy	0.350	0.098	
Strong Worker turnover	0.557	-0.400	
Shortage of experienced personnel	0.564	-0.541	
Dependency on few key persons Personal ownership	0.015	-0.029	

b) Examination of the matrix of the components after rotation

The rotation of the factors consists in virtually rotating the axes of the factors around the point of origin in order to redistribute more fairly the variance to be explained. The factorial solution then obtained is simpler to interpret and is theoretically more relevant than the solution without rotation. The rotation can be orthogonal when the factors are perceived as being independent of each other or even oblique when the factors can be correlated with each other.

The primary aim of rotation is to always optimize the reading of the factor weights of the variables. In the weight matrix, this means that in each row, there is a maximum weight close to 0 and a minimum of very high weights (ideally only one).

In practice, the varimax rotation method is used very regularly. This method is preferred, among others, when it is desired to minimize the number of items in a set to a fewer numbers of factors not correlated with each other and used, for example, in the context of multiple regression.

Furthermore, our the goal is to obtain factors representing a theoretically sensible construct, so oblique rotation is suggested, since it is difficult to postulate orthogonality between factors of the same construct. Table5 represent the output of the simulation.

Table5 Pattern and Structure matrices for PCA with Oblimi

	Structure Coefficients Component		Pattern Coefficients Component		Rank
	1	2	1	2	
Lack of managerial information and/or background related to the process of managing risk	0.299	0.761	0.179	0.732	7
The need to adopt appropriate processes for risk management	-0.12	0.712	-0.24	0.752	8
Lack of financial commitment on training and IT	0.165	0.741	0.044	0.734	9
Intangible benefits	0.104	0.764	-0.02	0.768	6
Low degree of mandatory for risk management process	0.125	0.803	-0.01	0.804	3
The establishment of an adequate risk management culture	0.808	0.276	0.783	0.147	2
The implementation of suitable tools and process for risk management	0.841	0.228	0.826	0.091	1
Time efficacy	0.794	0.303	0.765	0.177	4
Cost efficacy	0.208	0.328	0.158	0.302	11
Strong Worker turnover	0.684	0.157	0.676	0.046	10
Shortage of experienced personnel	0.779	0.070	0.789	-0.06	5
Dependency on few key persons Personal ownership	0.029	-0.01	0.032	-0.01	12

c) Identification of the greatest load for each variable

The next move is to take each element starting with the first and mark the highest load on the line. The absolute value of 0.30 is determined to be the minimum laod a factor may need to be regarded as relevant. However, to simplify this study the minimum load to be considerate is 0.6. The ideal is always to minimize the

number of significant loads per variable. In this regarde and after the rotation, 10 items are significantly considerate in the following order: *The need to adopt appropriate processes for risk management, The establishment of an adequate risk management culture, Low degree of mandatory for risk management process, Time efficacy, Shortage of experienced personnel, Intangible benefits, Lack of managerial information and/or background related to the process of managing risk, The implementation of suitable tools and process for risk management, Lack of financial commitment on training and IT and Strong Worker turnover.*

VII. Conclusion

we set to study the present stat of the implementation of risk management in comorian's SME. To do so we evaluate the dificulty on this implementation through 12 variables. We then run analysis through SPSS without a rotation and with an oblique rotation to determine their importance. Once the loads have been properly determine in the matrix and the factors, a framework is established out of these items that have an improtante load inside the column. Using the questionnaire and the exact wording of the items, we then take a look at the associated variables and try to understand a latent construct measured by the factor. The analysis results show us that diffrents dificulties were highlighted, but to simplyfy our research 2 difuculties are considerate and to be focus on mainly: ***The implementation of suitable tools and process for risk management*** *and* ***The establishment of an adequate risk management culture***, which are respectively represented as **technical subsystem** and **social subsystem.**

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DJAMIL Mohamed. "The present situation of risk management in Comorian small and medium-sized enterprises." *IOSR Journal of Business and Management (IOSR-JBM)*, 22(7), 2020, pp. 46-55.