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Research Paper

Risk Management from the Perspective of Startups

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Structured Abstract

Purpose: This study sought to present how startups relate to risk management concepts and practices to identify appropriate tools for the context of startups.

Methodology: Data were collected in two stages, first with face to face interviews and then with an online survey to analyze how startups think and act about risks. After that, data was descriptively analyzed and a Pearson correlation was generated to verify patterns in the risk analysis process in the startups. Finally, a risk management method adapted to the context of startups was suggested to facilitate the use in this type of company.

Findings: As results of this study, it was found that startups view the concept of risk in different ways and that the lack of familiarity with this topic and the empiricism while analyzing risks are independent of the operating time and capital invested in startups, but those which have a consolidated strategy have also better structured risk management processes.

Limitations: The sample size used in the research is considered a limitation and may be expanded in future works for better understanding the startups environment.

Practical implications: Startups can use this study, mainly the adaption suggested in section five, to better structure their risk management processes.

Originality/value: Literature regarding risks management does not often include the innovation context of startups, which are companies that deal all the time with high risk decisions. This study seeks to help to fill this gap in the literature.

Keywords: Risk, Startup, Risk Management, Innovation.

1. Introduction

Startups are innovative by nature. Thus, startups have the characteristic of being companies that deal with high levels of uncertainty and dynamicity, exposed to innumerous risks. Recent cases as the mass employee dismissal at Medium (Feldman, 2017) and the bankruptcy of the Brazilian company Fleety (Moreno, 2017) at the end of 2016 illustrate the wide range of risks

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that new business models face. Novel value propositions are not being approved that easily by customers that have never tried the new ways of consumption upon which these value propositions are built, or even by authorities that have the power for regulating controversial aspects of such new business models. Risks of various natures are aplenty in the context of startups, and often may be fatal (van Gelderen at al., 2005).

However, and despite the fact that the discipline of Risk Management already offers a number of widely consolidated methods, startups do not seem to use the traditional tools provided by this research field. Enterprise-wide risk management remains largely a topic of interest and practical implementation in large firms, with limited applications of technology-(Köhler and Som, 2014) or project-level risk management in startups or informal strategies such as tapping personal networks for financial risks (Kim and Vonortas, 2014). Discussion on enterprise risk management in small and medium-sized enterprises (SMEs) is somewhat fertile (Falkner and Hiebl, 2015; Brustbauer, 2016), but issues and recommendations are too generic and/or not readily applicable in the context of startups (Naude and Chiweshe, 2017). For instance, there is evidence that innovation-oriented SMEs may be more active in their risk management strategies (Brustbauer, 2016), but the results do not discriminate startups from traditional innovative SMEs, and details on appropriate risk management approaches for each type of SME are lacking.

Overall, it can be argued that risk management literature is scarce regarding specific models, techniques and tools tailored towards startups, which are companies that have to constantly deal with high risk decisions that may mean the upgrowth, the continuity, or even the end of its activities. It has been hinted that startups do manage risks, particularly those that operate in knowledge-intensive sectors, but actual risk management strategies seem to be unsystematic and focused on risk mitigation only (Kim and Vonortas, 2014). The lack of resources for developing and implementing risk management solutions that characterizes SMEs, especially in the form of specialized staff and/or funding for hiring consultancy firms, is particularly severe in cash-strapped startups. Moreover, the issue of balancing innovation (which frequently requires a risk taking orientation) and risk management capability building opens up complex decisions in the context of startups, which are often challenged by concomitant business model experimentation and formal business structuring (Gurd and Helliar, 2017). Finally, the individual characteristics of startup founders and initial teams members, such as their personalities and social capital resources, may impact the importance attributed to formal risk management in such firms (Gao et al., 2013) as well as specific measures startups adopt to identify, assess and mitigate risks (Kim and Vonortas, 2014).

This research seeks to advance the understanding about risk management in the context of startups. The objectives of the study are: (i) to understand how startups understand the concept of risks; (ii) to find out how/if practices of risk management are adopted in those companies; (iii) to suggest appropriate risk management tools to be used in startups. The study has an exploratory approach and has no ambition of delivering definitive answers to the matter. However, it seeks to create initial propositions in the field of risk management in the context of startups that should be further expanded in future research. From a first attempt to diagnose the situation, risk management tools and techniques adequate to the reality of risk management of those companies are suggested. From that, we hope to provide startups with starting guidelines about how to develop effective risk management processes.

2. Literature Review

Innovation in products, services and business models has been increasingly present in

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dynamic and competitive environments (Teece and Linden, 2017), being considered essential to the survival of companies in that context (Trott, 2012). However, enterprises take risks while innovating (Bessant, 2003). In this sense, risk is defined by Hubbard (2007) as a state of uncertainty, in which possibilities of loss and undesirable results exist. Purdy (2010) presents the notion of uncertainty affecting objectives, while Damodaran (2007) states that risk is related to the probability of having a different return on investment than expected, an approach that considers both negative (downside risk) and positive results (upside risk), a staple of what Verbano and Venturini (2011) call strategic risk management.

In this scenario, a number of approaches were proposed to manage risks in large firms. ISO 31000 (International Organization for Standardization, 2009), a derivative from the Australian and New Zealander norm AS/NZS 4360 (Standards Association of Australia, 1999) presents a five-stage risk management process: (i) context establishment, which is the definition of strategic objectives of the company and the evaluation of external and internal factors that may influence the organization performance; (ii) risk identification, when some issues, as what can happen, how, when and why, are periodically reviewed; (iii) analysis, or understanding of risks and its consequences and probabilities; (iv) evaluation, which is the stage of analysis about the level of each risk and its priority; and (v) risk treatment. Besides these stages, two others occur in between the whole process: communication and monitoring (International Organization for Standardization, 2009).

In this sense, the method proposed by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) brings similar aspects, disseminating the notion of Enterprise Risk Management (ERM) (Moeller, 2007; Verbano and Venturini, 2011). This concept is defined as the process applied when determining the strategy in the whole company, aiming to identify events that might affect it, managing risks to generate a reasonable safety for accomplishing its objectives (Moeller, 2007) while also creating a company-wide culture or risk management using expected economic-financial returns as guidelines to identify, assess and manage many different categories of risks (Verbano and Venturini, 2011). The method proposed by the entity uses as stages: (i) definition of internal environment, (ii) objectives fixation, (iii) events identification, (iv) risks evaluation, (v) risk response, (vi) control activities, (vii) information and communication and (viii) monitoring. That way, the ERM acts as a view in every sphere of the company, something that can be applied to the startups context, as they are companies in initial stages, what allows better risk analysis and control than in bigger and already consolidated companies.

While dealing with complex innovation environments, Tidd (2001) points out uncertainty and complexity as determinants in that context. That way, startups, which are organizations created to seek a repeatable and scalable business models (Blank and Dorf, 2012), need to deal with these variables in order to succeed. Crossan and Apaydin (2010) state that it is important to know how to tolerate failures and to be open to risk taking in order to innovate at the organizational level. Besides, they point out the need for establishing a link between results of an innovation and firm performance in appropriating value from innovation. Purdy (2010) affirms that a better consistency in definitions and risk processes leads to a better level of trust in the decision-making process, which is useful and necessary in the startup context. Bessant and Tidd (2007) argue that the development of new products and services is a gradual process of uncertainty reduction starting from ideas, passing through intermediary stages until getting to the success of commercialization.

Startups, which are companies that constantly innovate (Ries, 2011), are part of the initial stages of this gradual process, in which uncertainty is at its highest level. According to Beregheh et al. (2009), innovation is considered a process that occurs inside companies and

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that transforms ideas in new products, services or processes, providing those companies with better conditions to compete. Crossan and Apaydin (2010) expand the concept, considering it both as a process and a result. They present the social sphere in addition to the economic one and include the development of new methods of production and new management systems as types of innovation. Boje et al. (2012) affirm that the current competitive environment is turbulent and unpredictable and Falconer (2002) points that managers should enable change as part of firm-level learning process. In this sense, Bessant (2003) affirms that innovative companies constantly reinvent themselves regarding threats and opportunities imposed by the environment, which might mean the adoption or creation of new technologies.

Firms, thus, must improve their innovation capabilities in order to decrease, or at least manage, the uncertainty associated with innovation generation and adoption. What precisely is innovation capability, and what role risk management plays in it, is still an open question, however. Gurd and Helliar (2017) discuss the role of the company leader as an innovation enthusiastic versus a control manager, while Hyytinen et al. (2015) show that innovativeness is negatively associated with the subsequent survival of the startups. These discussions show that startups are different from small-medium sized traditional companies, as they need to deal with the issue of finding its own business model in a context of high risk. As a consequence, traditional management approaches do not work in this environment and tend to lead to failure (Blank; Dorf, 2012). Strategic plans are not the best way of planning under change environments because long term projections are not reliable. In addition, for a company which is developing its product and may change the customer segment, it is difficult to have a consistent strategy (Ries, 2011; Blank; Dorf, 2012). To deal with this problem, agile management approaches were developed focusing on development cultures that embraced receptiveness, acceptance to change and flexibility (Misra et al., 2012; Verdu-Jover et al., 2017), which may all be antecedents or success factors in implementing risk management strategies. Similarly, there are many practices applied to project management related to change, collaborative development, value proposition and robustness (Misra et al., 2012; Moran, 2015) that may contribute to risk management in startups, but they are usually not integrated in a comprehensive solution (Kim and Vonortas, 2014).

In the Brazilian context, factors pointed as contributors to startups discontinuity are invested capital and location (Arruda et al., 2014). The same authors show that companies that have money to run for one year or more in the beginning of their operations have twice the chances of survival than those which have capital to survive less than a year. Besides that, companies installed in business incubators, accelerators or technologic parks have three times less mortality risk than those that do not have access to such protective environments (Arruda et al, 2014). This was further investigated by Etges and Souza (2015), who found that startups installed in scientific and technologic parks can mitigate many of the risks which they are exposed to, as staff turnover and difficulty of keeping up with technology. These risks are mitigated due to the fact that the academic environment helps startups to get adequate human capital to their activities (Etges and Souza, 2015), which may even include supporting staff with risk management capabilities. Regarding companies' perceptions about the factors that lead to firm survival, product market acceptance, harmony between founders and managers' capacity to adapt to the market shifts and needs are highlighted. Lack of commitment by the founders, non-alignment between personal and professional interests of the founders and lack of capital to invest in the business are highlighted as the primary failure factors (Arruda et al, 2014). Although the lack of a risk management capability has not been explicitly pointed out as a key cause of startup failure, the indirect effects of not effectively managing risks may be a potential source of performance impairment that may be fatal to nascent enterprises.

3. Method

Despite being considered as risk capital businesses, little is said about how startups may analyze and deal with risks that are inherent to its corporate environment. Therefore, this study is inserted in a fragmented field of research initiatives and there is no consensus about how startups should conduct risk management. Hence, this research is exploratory, seeking to present the perception of startups leaders about risk in that type of company and developing an adaption of a risk management method to the startups context. From the results of this research, hypotheses may be suggested and tested, looking for a general understanding of startups behavior regarding risk management.

Data collection was executed in two stages. The first one was qualitative in nature, and used interviews with Brazilian startup founders. Eight people from different companies, selected by convenience and availability, were interviewed with the support of a semi-structured questionnaire with pre-defined questions to help the interviewer to guide the course of the conversation. Questions were allocated in three blocks.

The first block was a verification of prerequisites for the startup to be able to participate in the study. As acceptance criteria to participate in the survey, were considered the following conditions: (i) to have a company register (in Brazil it is called CNPJ): criteria that shows a legal level of commitment of the respondent with the company; (ii) the company received investment, either from founders or third parties: this presents a financial commitment from the partners; (iii) the company have not yet reached the breakeven point: criterion that characterizes startups - still does not survive on its own in the market. Besides that, identification information such as name, job title and academic education of the interviewee and firm age were asked.

The second block consists of qualitative questions in order to verify how the company understands, analyses and deals with the risks to which it is exposed. Questions were based in the main stages of risk management as proposed by ISO 31000 (International Organization for Standardization, 2009) and general stages such as identification, analysis, evaluation and treatment of the risks (Purdy, 2010). Based on that model, the following questions were proposed: (i) What do you understand as risk?; (ii) What are the biggest risks to your company today?; (iii) How are risks analyzed in your company? (iv) What is the strategy to deal with those risks? Thus, it was possible to semantically analyze how convergent are the knowledge and practices of risk management among the interviewees.

The aim of the third block was to validate the interview and also to understand the company context. The following questions were made: (i) Does the company have defined goals and strategic objectives?; (ii) Does the company have a definition of internal and external factors that may impact its performance? Something like SWOT analysis?; (iii) What is your risk profile (prone, moderate, averse to risk)?; What is your company's profile risk (prone, moderate, averse to risk)? Thereby, it was possible to understand the use or nonuse of planning and management practices, as well as the company strategic appreciation of risk.

The second research stage was quantitative, based on results of the first one. The goal of this stage was to get answers to the same questions from the previous stage, with a bigger number of startups, something that would not be possible through face-to-face interviews. Therefore, an online survey with the same questions form the first stage was made. The survey was sent to Brazilian startups associations, groups, incubators, accelerators and technological parks. Similar criteria were used to validate answers: (i) the startup should have CNPJ, (ii) the startup should have received investment, (iii) the respondent should have a management position in the startup. A total of 46 responses were collected and 31 were considered valid

according to these criteria. After this, data were analyzed by descriptive statistics and an analysis of Pearson correlation was done between some of the main variables collected in the second stage (Table 1).

Table 1: Overview of the variables used in the correlation analysis

Variable	*Measurement Unit*
Operating time	Months
How are risks analyzed in the company?	They are not analyzed - 0 Empirically, without the aid of tools or methods - 1 With the aid of tools or methods - 2
Does the company have defined goals and objectives?	No – 0 Yes – 1
Does the company have the definition of external and internal factors that can influence it?	No – 0 Yes – 1
Investment	Reais
Has the company already recovered the value invested (breakeven)?	No – 0 Yes – 1

Source: the authors.

4. Results

The first stage of the research, in which face-to-face interviews were made, generated more detail richness than the following stage. The second stage, however, generated a greater number of answers and allowed the suggestion of some proposals to the process of risk management in Brazilian startups.

4.1. Qualitative Stage Results

From the first block of questions it was possible to briefly analyze the profile of the interviewed companies. The evaluated startups have different backgrounds. There are companies working in the energy industry, 3D printing, education, knowledge management and digital marketing. The operating time also varies from six months to three years, which could suggest a different maturity level for risk management, although that was not identified in the quantitative research stage. Some had a low investment (four to 30 thousand reais), some were funded by public investment from P&D entities (from 100 thousand reais to little more than a half million reais). Lastly, there was one company funded by venture capital with six million reais of investment. Despite the disparity of investment quantities, none of the startups got to the breakeven point.

Half of the startups are installed in incubators and the others in shared or own offices. Besides, one of the companies has Brazilian founders but is based on Canada. All of them have CNPJ, with the exception of the foreign company, which has an equivalent register in Canada. Most of the interviewees are CEOs and all of them are partners of their companies,

therefore being able to give a clear vision of the intentions and strategies of their business.

Analyzing the first question of the second block, it is possible to notice some negativity attributed to the meaning of the word risk by some, "Probability of things going wrong", "Dangers in the path from a starting point to a final point", "Things you cannot control". Others face risk as something neutral, that can be either bad or good, and only one interviewee used the word "opportunity" in his answer. Regarding to which risks the respondents identified as the biggest ones to their companies, three items were highlighted: non-acceptance of the value proposition by the market, problems related to the Brazilian government, such as bureaucracies or high taxes and the lack of enough cash flow to maintain the company activities. It was also observed that half of the companies analyze risk empirically, and that operating time or investment don't correlate with this aspect, meaning that even more experienced or more financially compromised startups might analyse their risks just based on opinions. The youngest company (six months) affirmed that they don't to risk analysis due to their low investment (four thousand reais) until this moment, therefore they understand that it is not necessary to have a deeper understanding of the risks involving the business. Better organized startups in relation to risk management practices pointed out examples of tools such as control metrics, management spreadsheets, market monitoring related to competitors and new technologies. Besides that, it was possible to notice that startups with founders graduated or with professional experience in management showed a greater structuring in relation to risk management activities than companies that had founders with less training in management but greater technical skills about the product. It is noticeable that none of the startups uses analysis as those presented by methods diffused by the literature.

Regarding the last question of the second block, which refers to strategies to deal with the risks, one aspect that appeared in most of the interviews was the search for information related to market, clients, technology and the product itself. Besides that aspect, agility in the product development, contingency measures for unexpected results and validation of the product with the client were pointed out by some of the startups.

Examining the validation questions of the third block, it is possible to conclude that all startups have defined goals and objectives, although not all of them wanted or could specify their strategy, but the difference in operating time of those who didn't care to share this information is clear: the more experienced the startup is, the better structured its strategy was. In addition to that, it was possible to understand that all startups have some idea of the environment surrounding them, but few of them do active monitoring to keep internal and external factors that might influence their business up to date. Finally, by observing risk profiles of both interviewee and company, it was possible to notice that half the surveyed people consider themselves prone to risk, while the other half consider their positioning as moderate regarding risk propensity. No person or company was evaluated as averse to risk, something that can be expected in the scenario of enterprises working with innovation.

4.2 Quantitative Stage Results

From the startups that had their answers validated at the online formulary stage, most of them has more than two years of operating time. The investor's commitment in relation to deposited values in those startups is noticeable: 60% of the companies received between R$100.000 and R$2.000.000 (33% in the band of R$100.000 to R$500.00 and 27% between R$500.000 and R$2.000.000). Besides that, 72% of the companies still didn't recover the invested money. From those that did, 85% received between R$100.000 and R$500.000.

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A large majority (86%) of the enterprises declared that they have clearly defined strategic goals, and 88% of them presented valid answers, with objectives, quantitative definitions and specific deadlines when asked to provide examples of strategic goals. In addition to that, 70% of the companies have a definition of external and internal factors that may influence their performance. About the respondent's risk profile, 60% affirm to risk prone and 40% affirm to have a moderate risk profile. In relation to the companies' risk profiles, however, there seems to be a bit more caution, as 63% indicated that their startups have a moderate risk profile whereas the other 37% have a risk prone profile.

When asked about what they understand as risk, most of the respondents (72%) showed a negative perception, materializing itself in words such as "problems", "threats", "adversities", "barriers", "losses", among others. On the other hand, only 7% of the respondents seemed to have a vision of risk associated to the possibility of gain or return greater than normal. The remainder associated risk to the definition of Damodaran (2007), in which both scenarios (positive and negative outcomes) are considered.

The risk analysis occurs empirically and without aid of any risk management tools in most of the startups (70%). 22% of them utilize proper tools to this context and 7% affirm that don't analyze risks at all. Moreover, even in startups with more than two years of operating time, most of them (77%) analyze their data empirically. This distribution raises the hypothesis that startups are interested in analyzing risks since they do it empirically. However, they seem to have little access to risk management tools or proper tools to the startup scenario.

When asked about strategies to deal with risks, 35% execute an internal control, that could be financial, of product, trainings or action plans. 21% monitor their market, 18% make regular tests and only one company explicitly affirmed to look for client feedback. Seeking for clients' opinion is one of the pillars of the Lean Startup methodology (Ries, 2011), which points to obtaining quick answers to the business hypotheses in order to minimize errors in this kind of company. The behavior presented by most of the companies, contrary to what Ries (2011) suggests, seems more like consolidated enterprises than startups. In that sense, agility seems to be losing strength to stable practices of incumbents in the market, which might mean a problem related to the difficulty in reaching the exponential performance expected in the case of startups.

In addition to the analysis generated from the description of the data obtained in the survey, a Pearson correlation analysis was also generated (Table 2) and the results contribute to the propositions of the first phase. The maturity level of the risk analysis process has a slightly negative correlation index (-0.22) with startup operation time, which means that older companies have as much or even less structure for risk analysis than newly established companies.

The invested value has a slightly positive correlation index (+0.18) with the maturity level of the risk analysis process, which may raise some hypotheses: (i) for some of the companies with the highest levels of investment, there is a structure that allows the systematization of risk analysis process; (ii) companies with higher investments have investors who demand protection practices in relation to risks, what influence these companies to have better established processes for this. Anyway, the positive correlation found is low, suggesting that analysis based on opinions and feelings are common in startups with higher levels of investment and that the risk management process is not much more priority in these companies than in less capitalized ones.

On the other hand, there is a sign that companies that define strategic objectives and goals also better organize their risk analysis process (Pearson coefficient = +0.42). In addition,

companies that analyze the market in which they are inserted, evaluating opportunities and threats, also seem to signal a greater propensity to better organize risk analysis (Pearson coefficient = +0.34). These two correlations are the strongest found in the set of analyzed cases and may indicate that for the process of risk analysis to occur in a more organized way in the startups, it is necessary to have a first stage of strategies analysis and planning, since without these initial definitions there seems to be insufficient alignment for the risk management process to take place.

Finally, the correlation between the method of risk analysis and the issue of breakeven has almost no index (-0.07), which suggests that there is a random behavior between investments recovery and systematization of the risk analysis process.

Table 2: Pearson Correlation between the variables

	How are risks analyzed in the company?
Operating time	-0,22
Does the company have defined goals and objectives?	0,42
Does the company have the definition of external and internal factors that can influence it?	0,34
Investment	0,18
Has the company already recovered the value invested (breakeven)?	-0,07

Source: the authors.

5. Appropriateness of the risk management process to the startup context

Based on the analysis carried out with the startups, it is possible to notice that the companies which are entering the market need adapted risk management methods in order to be able to execute its activities. It is also important to highlight that adaptions in these methods can be useful for startups to create value and not only to be a bureaucratic process. In this study, we propose an adaption of the standard ISO 31000 (International Organization for Standardization, 2009), as it is a well-known method for risk management. The original method is presented in Figure 1.

First, it is important to highlight the correlations identified between strategies analysis and planning and the method of analyzing risks in the surveyed companies. These findings can drive the management structure for the company to reach a better risk management. Before trying to deal with risk management, it is necessary to structure the strategic analysis and planning, defining objectives and goals for the company and analyzing opportunities and threats of the market.

In the context of the risk management process in startup, **communication and consultation** should be part of daily quick changes and pivots (Ries, 2011). However, these stages of the risk management process need to be highlighted, considering it seems to occur in the minority of the analyzed startups. Thus, facing this scenario, we propose an approach that can

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be mixed with agile practices such as SCRUM (Shwaber and Beedle, 2001), where a revision practice of communication and consultation stages is suggested mainly for startup managers: first, the company's stakeholders groups need to be defined; after that, it is suggested that at least once a month or ideally in sprint retrospective meetings, one of the managers keep responsible for quickly presenting opinions from each stakeholders groups.

The **context establishment** stage seems to be something already incorporated to the reality of startups, given the fact that almost all startups do some kind of planning, goals and objectives definition and analyze internal and external factors that influence the company's performance. The main risks brought by partners of the companies diverge in some parts from Arruda et al (2014), showing the possibility of not having a consolidated understanding on the subject, seen that, in general, those are new companies and its partners are still in a learning process. This emphasizes the importance of the **risk identification** stage.

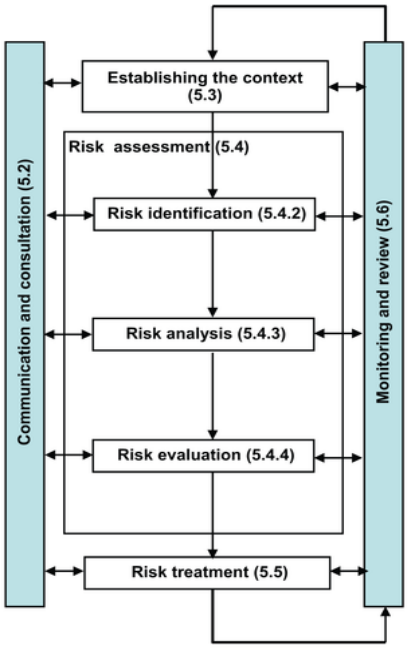
Thus, in that stage we suggest startups to evaluated factors related to: (i) partners: the amount of them that devote full time, the harmony between them, their ability to adapt the business to the market needs and changes, commitment and personal and professional interests alignment of the partners; (ii) environment: the place where the startup is installed, that may facilitate or complicate the functioning and human resource caption/attraction; and (iii) economic aspects: product or service acceptance of the market and capital volume invested. Furthermore, it is important to review items such as amount of full time devoted partners that have no other income sources and the possibility of incubation or acceleration in places with reduced functioning costs.

These aspects are points to be elucidated in the identification stage in order to verify their relevance or not. In addition to them, it is suggested to verify political, technological and legal aspects that, if altered, may change the entire course of the startup. An example of that was the changes in the credit card market proposal made by the Brazilian government, threatening fintech operations such as Nubank (Miozzo, 2016). Besides those aspects, other points considered as risks by team members should be pointed out according to the context in which the company is inserted and its development stage.

According to answers given by the startups, the stages of **risk analysis and evaluation** are usually driven by empiricism and almost never have arguments based in facts or data, just opinions and feelings. With risk identification and regular stakeholders' opinions gathering (performed in communication and consultation stage), it is possible to move on to analysis stages, in which each risk identified in the previous stage must be evaluated in relation to consequences it may cause. The evaluation stage complements the analysis stage by being the one where the decision about each risk level and priority is taken.

The **treatment** stage must be executed in two phases: first one is to define what to do about each risk: mitigate, avoid, accept or transfer. Based on that, the need of action plans is defined, followed by those plans definitions and execution. Thus, we propose the company to have a specific moment for the execution of both analysis and evaluation stages, along with the first phase of treatment stage in periodic meetings of the startup managers.

Figure 1. Risk management process



Source: International Organization for Standardization (2009).

Monitoring and review must be a periodic process, and both an active and passive dimensions may be highlighted. As startups are companies with short management cycles, actions must be developed, measured and its results and learnings must be verified in a quick way (Ries, 2011). Hence, risk management monitoring and revision is suggested to be executed in two levels (daily and sprint), following the SCRUM agile method (Shwaber and Beedle, 2001), widely used as project management method by startups. In daily meetings, internal and micro level risks should be approached, as they can be easily solved, while in the sprint retrospective meeting it is necessary to review how/if risks are affecting the company objectives and goals, also verifying the need of incorporating new risks and its treatments and monitoring. Active monitoring may be conducted by staff specifically trained to identify risks, while passive monitoring may be part of everyone's tasks. The latter would imply a minimum level of knowledge about what is risk and how to identify it, and thus may be out of reach for the smallest or less resourceful startup.

6. Conclusions

This research presents evidence of the lack of familiarity of Brazilian startup management teams with risk management methods, an issue that is potentially detrimental to the success of new ventures. Both qualitative and quantitative data suggest this lack of familiarity is unrelated to founders' experience or the total amount of invested capital (which, by its turn, may signal external recognition of the merits of the new business), which is an alert not only to founders, but also to incubators, accelerators and venture capital investors. Taken together, these signs may point to an overall lack of awareness regarding the importance of enterprise risk management in the notably risk-heavy Brazilian startup environment.

Although lacking knowledge about it, it was possible to notice that startup managers are largely interested in building risk management capabilities for their companies, recognizing that dealing in a more efficient way with practical tools to manage risks may be beneficial to

such firms, given that their companies deal with the results of risk decisions all the time. However, the methodologies that the current literature presents are too robust to the startup reality, which highlights the need of simpler methods appropriate to this initial phase of business organizations. So, a first attempt to adapt the widely known model presented in the ISO 31000 (International Organization for Standardization, 2009) was proposed, making use of management practices reportedly already known and adopted by startups. The rationale behind the proposed adaptation is to first familiarize startups with the risk management process by using what they already know and apply, building more complex and sophisticated solutions as risk management capability matures within these companies. Moreover, even simple practices such as those identified in the empirical research may, if adequately integrated in a proper risk management model, contribute immensely to startups' success.

In relation to popular approaches to structuring startups such as Lean Startup (Ries, 2011) and SCRUM (Shwaber and Beedle, 2001), which are fundamentally built upon the concept of testing and experimentation, it is remarkable that few companies reported the use of systematic testing to decrease the levels of risk. A grassroots adaptation of these well-known startup principles to risk management would not be a surprise to researchers, given that risk management approaches to technological projects already employ similar reasoning (Keizera et al., 2002) and instances of trial-and-error learning risk management in startups have been already identified (Sommer et al., 2009). Furthermore, the search for customer feedback was not mentioned as a risk identification strategy, even as customer involvement in innovative activities has been largely accepted as modern startups' *modus operandi* (Coviello and Joseph, 2012). This leads to the interpretation that Brazilian startups may be trying to behave as consolidated and stable enterprises too soon, which may possibly affect their risk management capabilities and consequently hamper their growth.

Finally, a number of limitations must be noted. A first limitation regards the nature itself of risk: a certain foreseeability is involved in the notion of risk management. Thus, this research did not investigated aspects related to a related and fruitful stream of research in innovation studies: that of management approaches to deal with unforeseeable uncertainties (e.g., Loch et al., 2008; Sommer et al., 2009). Instead, a strict ERM approach was chosen, a choice that defined our interpretation of risk management and, consequently, influenced our research design. As a result, our results must be interpreted with this limitation in mind. Additionally, there are limitations that arise from our methodological choices. First, the sample size used in the empirical study is small, and should be expanded in future works for better characterization of the Brazilian startup environment. Because it has an exploratory approach, no definitive answers regarding the adoption of risk management solutions by Brazilian startups were provided. Further research is paramount in order to further test the first impressions uncovered in this paper. Similarly, additional research may focus on testing the proposed model adaptation for risk management regarding its adequacy to startups operational and strategic routines. In particular, an aspect of special interest is the assessment of how 'hands on' such proposed model is, that is, to what extent founders and initial team members would be able to apply it by themselves, even if lacking formal risk management training. This assessment is particularly important for startups with typical limitations in terms of financial and human resources and also for business accelerators and incubators providing support to nascent enterprises. Finally, the need for studies related to risk management in innovation environments is emphasized as a way of supporting the practice of this subject in startups.

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