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UNVEILING THE NEXUS OF GENDER AND INTERNATIONAL EXPANSION: A bayesian network analysis of influencing factors in rapidly growing digital businesses

LEANDRO APARECIDO DA SILVA
UNIVERSIDADE FEDERAL DO RIO GRANDE DO NORTE (UFRN)

JOÃO FLORÊNCIO DA COSTA JÚNIOR
UNIVERSIDADE FEDERAL DO RIO GRANDE DO NORTE (UFRN)

AFRÂNIO GALDINO DE ARAÚJO
UNIVERSIDADE FEDERAL DO RIO GRANDE DO NORTE (UFRN)

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INTRODUCTION

Globalization resulted in the reduction of trade barriers and the increase of international commerce, creating economic and institutional conditions for rapid growth international expansion for organizations in both developed and emerging countries (Amal et al., 2013; Luo & Tung, 2007). Participation in foreign markets presents itself as an essential competitive advantage for organizations, especially to overcome the limitations of the internal market, such as low or seasonal internal demand, excessive local competition, and restrictive local regulations. International expansion represents an opportunity for organizations to build sustainable competitive advantage, however, they must be aware of the trials to which they will be subjected, such as different economic and political scenarios, new competitors, new regulations and laws, as well as other demands. of quality to which they are not accustomed (Amal et al., 2013; García-García et al., 2022).

International expansion has proven to be an extraordinary commercial outlet for many organizations. Some scholars argue that international expansion adds value to organizations (Lee, 2008). Specific characteristics of organizations associated with their international expansion were studied, and are present in several scientific publications on the subject (Mauri et al., 2017). Such organizational characteristics, inherent to international expansion, are well documented in international business studies (Chari, 2007; Kotabe et al., 2002; Hymer, 1976), pointing out that organizations that expand internationally are subject to their particular strategies, in the way they seek to expand their business to other nations (Mauri et al., 2017), suffering influence from several factors, including personality traits and individual perceptions from CEOs and founders (García-García et al., 2022). Gender may also be a dimension of top organizational management that can affect the way the organization builds and executes its strategies (Dikova & Brouthers, 2015).

Gender can be a determining factor in organizational positioning vis-à-vis other competitors in the market, as well as in the company's own performance. An important issue related to organizational results is the idea that women and men have different behaviors for the same issues. The implications of gender on organizational performance are indeed indirect, however, certain organizations in the service sector, led by women, showed an expressive positive behaviour, due to their greater emphasis on market orientation, when compared to organizations with the same profile, but with men at the forefront of their management (Davis et al., 2010).

Several studies have already dealt with the behaviour of senior management, the manager's gender and organizational performance. Bertrand and Schoar (2003) analysed how the CEO's managerial attitude affects organizational performance, resulting in heterogeneity in company performance. Simeon (2001) analysed certain characteristics of top management such as age, position and educational background, considering how these are important corporate management variables that interfere with the diversification and specialization of an organization. Golden and Zajac (2001) found that strategic changes and the organization's operational strategy can be achieved by top management attributes. The studies by Chava and Puranandam (2010) and Kuo et al. (2014) highlighted that an organization's financial resources are significantly influenced by the stimuli given to top management to take risks. Due to the great influence of top management on strategic decisions, with significant impacts on the direction of the organization, gender diversity and the gender of top management can play an important role in corporate decisions (Ullah et al., 2019).

Observing the relevant importance of gender diversity, several developed countries such as Spain, Sweden and France, and even emerging ones such as Malaysia, among others, made it mandatory that a significant portion of the board of senior management of private and public organizations be occupied by women (Nekhili & Gatfaoui, 2012; Terjesen et al., 2014; Ullah et al., 2019). Such measures adopted by some countries are corroborated, on some occasions, by the fact of the disparity observed in the positions of the top management of the organizations, referring to occupation by gender. In the study by Costa Júnior et al. (2023), it was observed that most Founders and/or CEOs of fast-growing digital businesses were male, with a representativeness of 80% within the study sample. The survey also recommended conducting studies on different patterns of growth strategy, based on gender. In order to analyse the percentage of gender participation with the top management of organizations, it may be necessary to assess a database with a significant amount of information. Making it imperative to use a computational model that aggregates and supports the identification of strategic factors that may influence the organization's international expansion, according to the strategic option adopted by the manager's gender.

The use of Bayesian Networks (BN) to support decision-making is present in several areas of knowledge, especially from the facilitated access to computational tools and technologies capable of promoting the rapid development of frameworks that contemplate the connection between several variables. The use of a knowledge-based system may allow the assimilation of behaviors through probabilistic results obtained from the BN. Another advantage of the model comes from the predictions obtained from the simulations; these are conceived from real interferences of the data. From the elaboration and execution of the network, considering all the study variables, it is possible to measure the degree of uncertainty in the results (Silva et al., 2021a). The BN is able to simulate a graphical model that compiles, in a satisfactory way, the joint probabilities for several variables, established from previous information (Heckerman, 2008).

Studies on Bayesian Networks have been widely used in several areas of research, such as medicine (Julia Flores et al., 2011; Haddawy et al., 2018), defence, robotics and energy industries (Lazkano et al., 2007; Munya et al., 2015; Buriticá & Tesfamariam, 2015), project management (Silva et al., 2021a), social sciences, including ecology (Lau et al., 2017; Dang et al., 2019), finance and economics (Gemela, 2001; Kita et al., 2012), services (de Sá et al., 2018), among others. For many years, scholars dedicated to Artificial Intelligence (AI) research have included Bayesian Networks for encoding specialized knowledge (Heckerman et al., 1995).

Thus, based on the importance of international expansion for organizations, especially those that adopt a model of rapid growth, as well as the influence that a manager's gender can have on the factors that establish an organization's strategic changes, and taking into account the need to utilize a probabilistic model such as Bayesian Networks, which appears to facilitate understanding of the interconnectedness of data with international expansion and the factors that influence this expansion from a gender-related perspective, the current research seeks to analyse the factors that influence managers' decisions in the international expansion strategy of fast-growing digital businesses, and assess the impact of gender on such decisions.

THEORETICAL BACKGROUND

International Expansion

Organizations may opt for a gradual approach in expanding their international activities due to limited knowledge about foreign markets (Amal et al., 2013). Over the course of more than 30 years, researchers have attempted to comprehend the factors that influence organizations' decisions to engage in international acquisitions. However, a consensus regarding the true motivations behind such choices has yet to be reached (Dikova & Brouthers,

2015).Expanding internationally is a resource-intensive and time-consuming process for organizations. When organizations reach the execution phase of their international expansion, some may reduce the pace of expansion in subsequent periods if they encounter significant geographic and cultural differences. These organizations have experienced negative outcomes due to the cultural disparities between their operating environment and the organization itself, leading to a decline in the rate of international expansion. When faced with substantial geographic distance and cultural diversity, some organizations display a reduced inclination to expand or struggle to adapt to new environments (Hutzschenreuter et al., 2011).

The internationalization process within rapidly growing organizations can occur through both divestitures and acquisitions involving companies from different countries. A study has observed that acquirers of fast-growing organizations, both in the United States and Europe, initially prefer acquiring organizations that are in close proximity to their existing operational base. Spatial and geographic distance were considered significant factors influencing international transactions by the organizations analysed. However, the same study revealed noteworthy developments among fast-growing European organizations, resulting in a significant increase in their expansion beyond Europe. Correspondingly, American organizations demonstrated a heightened interest in fast-growing organizations originating from the European continent. Another key finding from the aforementioned study is that both North American and European acquirers actively seek out young, fast-growing organizations. It was noted that the older a fast-growing organization becomes, the less likely it is to be acquired (Pisoni & Onetti, 2018).

In a different scenario, the internationalization of certain organizations was examined from the perspective of three key factors: logistical proximity, a distinctive fast management model tailored to the target market, and specific attributes inherent to the organization itself, such as skills, size, or accessible resources. These factors serve as motivations for international expansion. However, it should be noted that the internationalization process can also impact these factors, potentially leading to tensions and necessitating adjustments in the organization's strategy. The logistical gap between end markets and the organization's supply chain, the responsiveness of the target market to the organization's requirements, and the cultural disparity between the destination market and the organization's management model were identified as influential aspects. It was observed that if the challenges posed by geographic distance can be overcome, the organization can proceed with the internationalization process. However, if obstacles related to these factors persist, the international expansion process may become stagnant or require reorganization (Runfola & Guercini, 2013).

Characteristics inherent to organizations, combined with the country of origin, can significantly impact the process of international expansion. Two crucial factors are the availability of specialized local labour, necessary for incorporating the specific attributes of the expanding organization, and the presence of integrated resources. Both these conditions are vital for successful organizational expansion. Additionally, the compatibility between the organizational management model and the institutional environment of the target destination must be taken into account. An institutional atmosphere that is incongruent with the organization's behaviour can lead to excessive costs, impeding the development and access to additional resources crucial for expansion. Expanding internationally into a new region necessitates a combination of skills, capabilities, and resources to surmount barriers. Besides location constraints, the fragmentation of the organization's specific attributes exacerbates the challenges, restricting the organization's expansion process in the final market (Mauri et al., 2017).

In a study involving organizations based in the United States of America, the international expansion process exhibited a curvilinear relationship with the organization's value. It was observed that organizations should not rush to attain immediate returns following

the international expansion of their operations. This is due to the extended period required to realize the benefits resulting from the expansion. The positive outcomes of expansion become evident only after a certain duration of internationalization has been surpassed; they are not observed prior to reaching that threshold (Lee, 2008).In another study focused on Japanese machinery organizations, it was noted that the performance of these companies, relative to their aspirations, influenced their ability to engage in the process of international expansion. When an organization's performance aligns closely with its goals, it becomes more inclined to invest abroad. Conversely, organizations tend to distance themselves from international expansion when their performance falls short of expectations (Jiang & Holburn, 2018).

There is a notable distinction between the international expansion processes of organizations from developed countries compared to those from emerging countries. Organizations based in developed countries typically possess greater access to technologies and, consequently, information about their business partners. These factors significantly influence their international expansion strategies. In this context, the differences in internationalization are not solely attributed to the specific attributes of the organizations but also to the unique advantages offered by their domestic markets and the nature of their relationships with commercial partners (Amal et al., 2013; Luo & Tung, 2007).Additionally, another crucial aspect related to international expansion pertains to the demand conditions within the target market. Organizations are more inclined to expand their activities in locations characterized by favourable demand conditions for their products and/or services (Nielsen et al., 2017).

Another noteworthy aspect concerning international expansion pertains to the inclination of managers to embrace the associated risks (Coviello, 2015). The actions undertaken by top management can directly impact crucial changes that either accelerate or decelerate the process of international expansion (García-García et al., 2022). It is imperative for organizational leadership to recognize that decision-making processes related to international expansion are vulnerable to cognitive biases, which may have detrimental effects on long-term performance. There is a possibility that managers exhibit an overly conservative decision-making approach when pursuing an international expansion strategy, influenced by personal experiences with past corporate performance, whether positive or negative (Jiang & Holburn, 2018).

Managers exhibit different attitudes towards risk-taking. Some managers are prepared and willing to actively pursue international expansion for their organizations, displaying a higher propensity to enter new markets. They may do so with the expectation that assuming a higher level of risk, such as venturing into new markets, could yield greater returns. Conversely, other managers tend to be more risk-averse, showing hesitation in expanding the organization internationally, particularly when it involves entering unfamiliar markets and cultures (García-García et al., 2022). It is observed that organizational decisions can be influenced by personal characteristics of managers. In this regard, the gender of the manager is a dimension that may impact how the organization formulates its strategies and actions (Dikova & Brouthers, 2015).

Gender

The gender of a manager can be a decisive factor in an organization's strategic positioning regarding market actions and overall performance. It is noteworthy that women and men exhibit different behaviors when faced with similar challenges. In a study addressing this topic, it was observed that service sector companies led by women displayed a significantly positive behaviour, primarily due to a strong emphasis on market orientation, when compared to companies with a similar profile but led by men (Davis et al., 2010). Furthermore, differences can be observed in how women and men manage their organizations. Women tend to express

their ideas in a more concrete manner, while men often employ more abstract communication styles. Additionally, it is important to consider that certain investors prioritize relatively concrete communication rather than solely relying on abstract communication as a driver for long-term development. These observations partially explain the existing gender differences in organizational investments (Huang et al., 2020).

CEOs in the majority of organizations are male, and when there is a change in the CEO position, it is highly likely that the successor will also be male. Organizations tend to maintain the status quo by appointing successors of the same gender in order to minimize disruptions associated with gender transitions. Consequently, this convergence towards maintaining the gender disparity contributes, at least partially, to the persistence of gender imbalance in top management positions (Zhang & Qu, 2016). A study conducted in London revealed that eighty percent of CEOs/Founders were male, further supporting these findings (Costa Júnior et al., 2023). Another study focused on venture capital firms highlighted a significant underrepresentation of female managers at both ends of the spectrum. They are underrepresented as providers of venture capital and as recipients of venture capital funding (Aidis & Schillo, 2017). Although there may be cases where female managers appear to be on equal footing with their male counterparts, a closer examination reveals that women may actually face less favourable conditions (Yang et al., 2020).

Despite possessing similar personal qualifications and comparable financial resources, companies led by female CEOs may face disadvantages in terms of their ability to secure external capital. Female CEOs often encounter more negative evaluations, which can have significant social and economic implications. These factors contribute to a lower likelihood of attracting investors for IPOs (Initial Public Offerings) (Bigelow et al., 2012). Furthermore, female representation in senior management positions across organizations worldwide, particularly in emerging economies, remains significantly low. A study revealed that 56% of the organizations analysed did not have a female director on their board of directors. It is crucial to promote constructive measures at both the business and government levels to address the gender disparity and encourage greater participation of women in top-level organizational management (Oba & Fodio, 2013).

France has taken steps to emulate Norway in promoting gender diversity in the management of French organizations through the implementation of a new law. This legislation gradually mandates that large corporations must have a minimum representation of 40% female managers on their boards of directors, a percentage in line with Norway's female participation policy. Prior to this, except for specific instances, French organizations had been less inclined to hire female managers due to concerns related to gender diversity. However, the ascent of women in management positions is influenced by factors such as family backgrounds, board size, and demographic characteristics (Nekhili & Gatfaoui, 2012). Gender diversity in top management positions is not solely a concern for developed countries. A study conducted in Pakistan observed that excluding women from management roles, particularly from top management teams, can lead organizations to make flawed strategic decisions (Ullah et al., 2019).

A study conducted on North American organizations revealed several characteristics associated with female CEOs. They tend to be younger than their male counterparts, oversee smaller organizations, and generate lower percentage returns to shareholders. Interestingly, the study found no gender-based disparity in CEO compensation among the analysed organizations. This suggests that women receive similar compensation bonuses to men at the CEO level, indicating a level of equality in remuneration (Adams et al., 2007). In addition, another research study observed that the gender of the CEO can impact the organization's correlation with risk. Specifically, CEO gender differences may not have a beneficial effect on risk. Consequently, certain organizations should prioritize risk considerations and carefully

assess managerial actions to gain a deeper understanding of the organization's financial decision-making. Factors related to managerial behaviour play a significant role in shaping the direction of the organization (Chava & Purnanandam, 2010). Overall, these findings shed light on the dynamics of gender in top leadership positions and highlight the importance of considering various factors when evaluating CEO characteristics and their impact on organizational outcomes.

A study conducted in Nigeria revealed that the presence of women in the top management team and a higher number of women on the senior management board positively impact organizational performance. Specifically, the study indicated that having multiple female directors is associated with improved revenues (Oba & Fodio, 2013). Although the advancement of female managers to senior positions in organizations has been slow, the increasing number of highly qualified women for such roles is challenging negative stereotypes surrounding women in senior management positions (Adams et al., 2007). Gender differences, along with other attributes, can have significant implications for the strategic actions of top corporate management. The gender of CEOs, among other factors, can influence their ability to fulfil their responsibilities within the organization (Kaur & Singh, 2019).Considering the importance of understanding managers' gender-specific interests in conjunction with organizational expansion strategies, the implementation of a flexible and transparent structuring method becomes essential. Such a method should aim to provide satisfactory results that aid in the decision-making process. Studies utilizing Bayesian Networks have demonstrated promising outcomes in meeting these demands (Stritih et al., 2020).

Bayesian Networks

Bayesian networks (BNs) are graphical representations of probabilistic patterns that allow for the application of statistically valid and mathematically rigorous techniques to perform reasoning in uncertain environments. They are known by various names, such as Bayesian belief networks, Bayes networks, expert systems, Bayesian networks, or graphical probabilistic networks. BNs focus on the grouping of variables represented as nodes, connected by directional arrows. Each variable can have a finite number of mutually exclusive states. Nodes and arrows are arranged to form a directed acyclic graph (DAG), where all arrows have a specified direction. Directed links between nodes represent the causal relationships or dependencies between variables, indicating how one variable influences another (Heckerman et al., 1995; Lau et al., 2017; de Sá et al., 2018). The links between nodes are quantified using probability tables associated with the variables, allowing for the representation of conditional dependencies (Gemela, 2001; Biedermann et al., 2005; Munya et al., 2015).

In BNs, the nodes represent relevant variables with well-defined meanings within a specific inference problem. Nodes without incoming arrows are known as source nodes. Relationships between nodes are often described using kinship terminology, such as ancestors, descendants, parents, children, and others (Biedermann et al., 2005; Kita et al., 2012; Lau et al., 2017). Unlike systems based on neural networks or rules, the arrows in a BN do not signify data flow. Instead, the arrows represent dependencies that reflect attributes of potential real-world problems. While some connections between nodes can be interpreted as causal relationships, it is also plausible to conceive of links purely in terms of associations. It is important to note that there is generally no entirely deterministic influence of one node (variable) on another in a BN; therefore, results are obtained through probabilities (Biedermann et al., 2005; Lazkano et al., 2007; Buriticá & Tesfamariam, 2015).

In BNs probability tables are utilized to estimate the likely state of a parent node, also known as the root variable. These tables also quantify the dependencies between different nodes (variables) within the network. BNs exhibit three types of network connections: serial,

divergent, and convergent (Figure 1) (Biedermann et al., 2005; Wang et al., 2013). In divergent (see Figure 1(b)) and serial (see Figure 1(a)) connections, changes in the state of node (variable) A will impact the outcome of node (variable) C, even if node (variable) B is not instantiated. However, if node (variable) B is known, the truth state of node (variable) A no longer affects the truth state of node (variable) C, and vice versa. The situation differs for convergent connections (see Figure 1(c)). In this case, the intermediate node (variable) B (or any eventual descendant in a network with additional nodes) must receive evidence to enable changes in the truth state of node (variable) A to affect the truth state of node (variable) C. Nodes (variables) A and C in Figure 1(c) share a common child node (variable), node (variable) B. The occurrence of the common descendant, node B, can increase the probability of the two independent parent nodes, A and C (Biedermann et al., 2005; Kwan et al., 2008; Ruiz et al., 2009).

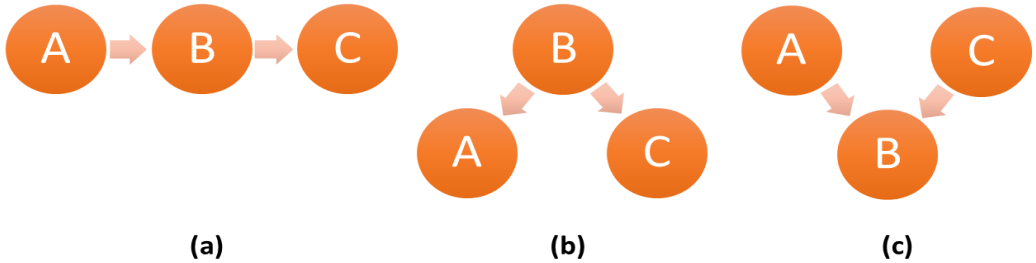

Figure 1. Connection structure of Bayesian networks: (a) serial connections, (b) divergent connections and (c) convergent connections.
Source: Adapted from "Using Bayesian networks in analysing powerful earthquake disaster chains" by J. Wang, X. Gu and T. Huang, 2013, *Natural Hazards* , *68* (2), 509–527. https://doi.org/10.1007/s11069-013-0631-0

(BNs encompass four distinct types of reasoning: diagnostic, predictive, intercausal, and combined (Korb & Nicholson, 2011). A crucial aspect in the verification and updating of BNs is the incorporation of evidence, which enables network analysts to revise information associated with the various nodes (variables) within the BN. This process enhances the optimization of BN analysis. Depending on the software employed, BNs can serve as visualization interfaces, facilitating the integration of the aforementioned reasoning types during analysis. This valuable resource allows BN analysts to dynamically monitor potential simulations and explore the impact of multiple evidence scenarios at various stages of analysis. The diverse reasoning capabilities of BNs can effectively support network analysts in making informed decisions (Taroni et al., 2004; Abolbashari et al., 2018).

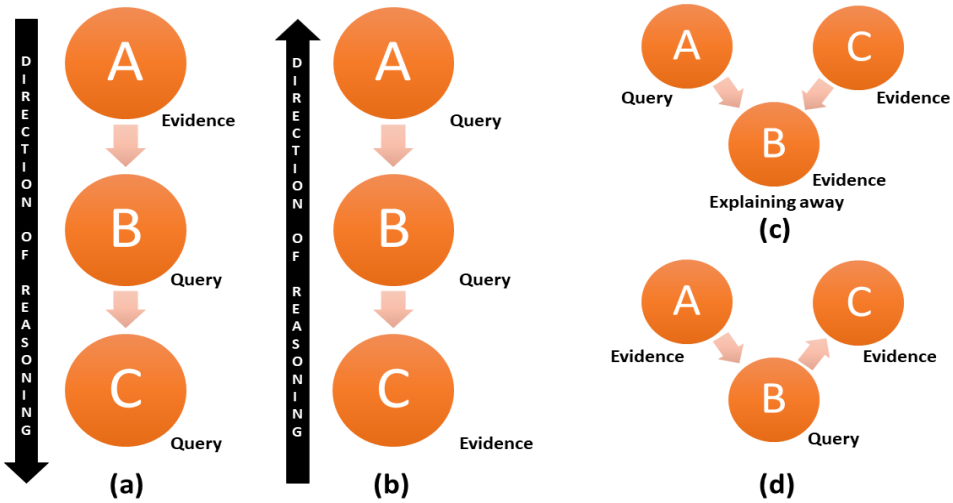

Figure 2. Types of reasoning in Bayesian networks: (a) predictive reasoning, (b) diagnostic reasoning, (c) intercausal reasoning and (d) combined reasoning.
Source: Adapted from " *Bayesian Artificial Intelligence* (2nd ed.)" by K. B. Korb and A. E. Nicholson, 2011, CRC Press.

Understanding how each type of reasoning interacts with Bayesian networks (BNs) is essential. Predictive reasoning relies on the available knowledge about the parent nodes and follows a top-down approach, moving from ascending nodes to descending nodes. Figure 2(a) provides an illustration of this reasoning type. Predictive reasoning is employed when information is known about the states of the parent nodes, and the BN analyst seeks to determine the potential effects these nodes may have on their descendants (child nodes). Diagnostic reasoning, depicted in Figure 2(b), examines the effects of potential causes when a specific condition is observed as evidence in a descendant node (child node). Consequently, the observed belief in the ascending nodes (parent nodes) is automatically updated within the network. This reasoning type is employed when exploring future scenarios and simulating possible paths within the network. It is particularly useful for organizational strategic planning. For instance, if an organization aims to achieve a specific performance level, the BN analyst can simulate the desired level within the model, allowing the network to update the probabilities associated with the desired actions. These reasoning types, along with their corresponding illustrations, demonstrate the versatility and applicability of BNs in various domains, including organizational decision-making processes (Biedermann et al., 2005; Korb & Nicholson, 2011; Abolbashari et al., 2018).

In Bayesian networks (BNs), reasoning plays a crucial role in extracting meaningful insights from the network structure. Figure 2(c) illustrates an important reasoning type called conditional reasoning. It is particularly useful when a node has two parents, and only one of these parents is known. Leveraging prior knowledge of one parent, it becomes possible to simulate the status of the other parent node. This reasoning approach is highly valuable in scenarios where complete estimates of all variables (nodes) are unattainable. There are several factors contributing to the lack of information, such as imposed secrecy, time constraints in accessing certain information, or organizations' reluctance to share information due to potential competition. In complex purchasing environments, for instance, this type of reasoning can provide valuable insights even when full information is not available for all relevant variables. Another important reasoning type is combined reasoning, as depicted in Figure 2(d). It enables the simultaneous examination of the states of a specific node, its parent nodes, and its child nodes. As the name suggests, this reasoning type combines multiple aspects within the network, offering a comprehensive perspective on the relationships between variables. These distinct reasoning types in BNs, including conditional and combined reasoning, provide researchers and analysts with powerful tools to navigate complex systems and derive valuable insights (Korb & Nicholson, 2011; Abolbashari et al., 2018).

BNs excel in handling incomplete information sets and facilitating the understanding of causal relationships. By integrating Bayesian statistical techniques, they contribute to knowledge combination and support decision-making processes. One of the key advantages of BNs is their ability to provide an agile approach that avoids overfitting with the available data. This allows for the construction of models that effectively utilize and analyse all the pertinent information about the problem at hand (Heckerman et al., 1995; Heckerman, 2008). Through the construction and execution of the BN, considering all relevant variables, analysts can assess the level of uncertainty associated with the actions related to the problem. By conducting simulations and comparing different courses of action, probabilistic outcomes can be obtained, thereby empowering analysts in the decision-making process. These probabilistic results

derived from BNs aid in quantifying and managing the uncertainty associated with complex problems, providing valuable insights for decision-makers (Silva et al., 2021a).

METHODOLOGY

The data selection and classification phases employed a descriptive typological framework. The preparation and execution phase of the Bayesian Network utilized an applied typology (Nassaji, 2015). The structure of the Bayesian Network encompasses both qualitative and quantitative approaches (Efe et al., 2018). The qualitative structure, referred to as structural learning, is derived from the network's modelling and the reasoning employed in the analysis. It captures the observable interdependencies between variables and informs the decision-making process of the network analyst. Questions of interest, guided by the reasoning employed, can be effectively addressed at a qualitative level, focusing on the meaning and not just the extent of probabilistic linkages. The main types of reasoning (Figure 2) include diagnostic, predictive, intercausal, and combined. This study employed diagnostic reasoning, aiming to observe updated results in the ascending variable (parent node) based on simulations conducted in the descending variable (child node) (Biedermann et al., 2005; Korb & Nicholson, 2011; Efe et al., 2018). The quantitative approach, known as parameter learning, assigns weights (values) to the connections that reflect the dependencies between variables (nodes), distributed within a probabilistic framework. This quantitative approach is rooted in cause-and-effect relationships derived from the parameters (Efe et al., 2018).

The survey sample was selected from digital based businesses that participated via invitation to networking and business meetings to discuss how to maintain fast growth and increase performance. The data includes records obtained from events held in Amsterdam, Berlin, London, New York, and Paris. The analysed organizations had to meet specific criteria, including a digitally enabled business model, a minimum 20% growth rate over three consecutive years, and participation exclusively from founders and/or CEOs who hold primary shareholding or occupy top management positions within the company (Costa Júnior et al., 2023). Given that all organizations met the pre-established criteria, the authors believe that the sample represents an unbiased profile capable of providing meaningful insights about the analysed population (Saunders et al., 2019).

The study utilized two dataframe fields: Gender, which provides information on the gender of the CEOs and/or founders, and Interested in, which encompasses participants' preferences regarding International Expansion, as well as other factors of interest examined in the study. These factors include Exits and Acquisitions, Building and managing an effective board, Balancing growth vs profit, Growth through acquisitions, Other options to venture capital: debt, venture debt & private equity, Pre IPO planning, and None of the above (Silva et al., 2022). Upon careful examination of the dataframe, it was determined that the records did not require any additional data processing, as both the Gender field and the Interested in field were standardized. The sample size is presented in Table 1.

Table 1
Universe of Research and Sample

Gender							
Masculine	Year	2016	2017	2018	2019	2020	Total
	Number of respondents	22	163	112	307	67	671
Feminine	Year	2016	2017	2018	2019	2020	Total

	Number of respondents		11	25	12	46	25	119
Total Respondents	Year		2016	2017	2018	2019	2020	Total
	Number of respondents		33	188	124	353	92	790

Out of the 1,578 records in the dataset, only 791 respondents provided information about their gender. In 2019, one respondent identified their gender as "Other." For the remaining 787 records, the gender field was left empty. Upon examination of the data frame, it became apparent that the records were not organized in a probabilistic structure, which is the standard format for constructing Bayesian Networks (BNs). Consequently, it was necessary to standardize the data. To achieve this, Equation 1, as recommended by Silva et al. (2021b), was employed to establish a structured grouping of the records. This approach offers a valuable framework for data standardization, ensuring the preparation of a robust BN.

$$PG_{RB} = \frac{EG_{RB}}{TG_{RB}} \quad (1)$$

PG_{RB} represents the standardization aspirated in the clustering of the node (variable) of the BN. EG_{RB} refers to the raw record in the dataframe (non-standard). TG_{RB} represents the total sum of non-standardized records of a given field of interest. The equation employed in this study effectively incorporates the participation of each record within its respective field of interest, ensuring that the sum of all records within a specific group yields a value of 1 (Silva et al., 2021b). To facilitate this standardization process, the entire database will be standardized using the Python 3.8 programming language, with the algorithms executed on the Anaconda Spyder 4.1.5 platform. Two algorithms will be utilized to standardize the data for implementing the Bayesian Network (BN). The first algorithm will group the Gender variable with the International Expansion variable, enabling the classification and standardization of each gender group that responded positively to the International Expansion option. The outcomes of this process will provide the necessary information for designing the first node (variable) of the BN, which will be denoted as International Expansion. Figure 3 provides a detailed depiction of the algorithm, illustrating each step of the standardization procedure.

Algorithm	Action description
`import pandas as pd`	Software library used in the Python language for data analysis and manipulation.
`worksheet_path = "Database.xlsx"`	Path to access the file with the records in .xlsx spreadsheet format. Note that this path will only work if both files (algorithm and logs) are in the same folder.
`dataframe = pd.read_excel(worksheet_path)`	Load dataframe information using the panda's library
`def get_occurrences(dataframe, interest, gender):` `  return len(dataframe[(dataframe["Interested in"].str.contains(interest)) &`	Definition of the function that will return the reading of the records that meet the specified interest according to the genre

(dataframe["Gender"].str.contains(gender))])	

def calculate_percentage(factors):
    total_values = sum(factors.values())
    percentages = {variable: (value/ total_values) * 100 for variable, value in factors.items()}
    return percentages
	Definition of the function that will calculate and return as a result the percentage of factors that meet the pre-established criteria. Here the calculation of Equation 1 will occur.

gender_interest = ['Male', 'Female']	Assignment of the genders of interest, male or female.
IEGender = {f'IE{gender}': get_occurrences(dataframe, "International Expansion", gender) for gender in gender_interest}	Attribution of the interest factor, in the case of "International Expansion", to the assigned genre of interest. Running the get_occurrences function.
percentages = calculate_percentage(IEGender)	Calculates the percentage for each of the genders. Running calculate_percentage function from assignment in IEGender.
for variable, percentage in percentages.items(): print(f"{variable}: {percentage:.2f}%")	Prints the results regarding the participation of each gender (Male or Female). The total must correspond to 100%, base prerogative for the elaboration of the node in the RB.
print(IEGender)	Prints the specific amount of responses from each gender (Male or Female) that shows interest in International Expansion.

Figure 3. International Expansion pooled genre standardization algorithm .

The second algorithm will conduct the standardization process by grouping not only Gender and International Expansion, but also the other factors of interest identified in the Interested field of the dataframe. These factors include: Exits and Acquisitions, Building and managing an effective board, Balancing growth vs profit, Growth through acquisitions, Other options to venture capital: debt, venture debt & private equity, Pre IPO planning, and None of the above. The outcomes of this algorithm will provide the necessary information for designing the second node (variable) of the Bayesian Network (BN), which will be referred to as Interest Factors. A detailed outline of the algorithm's steps is presented in Figure 4, providing a comprehensive understanding of each stage.

Algorithm	Action description
import pandas as pd	Software library used in the Python language for data analysis and manipulation.
worksheet_path = "Database.xlsx"	Path to access the file with the records in .xlsx spreadsheet format. Note that this path will

	only work if both files (algorithm and logs) are in the same folder.
Dataframe = pd.read_excel(worksheet_path)	Load dataframe information using the panda's library
def get_occurrences(dataframe, interest, gender): return len(dataframe[(dataframe["Interested in"].str.contains("International Expansion")) & (dataframe["Interested in"].str.contains(interest)) & (dataframe["Gender"].str.contains(gender))])	Definition of the function that will return the reading of records that meet the specific interest "International Expansion!", according to gender and other factors of interest.

def calculate_percentage(factors):
   total_values = sum(factors.values())
   percentages = {variable: (value / total_values) * 100 for variable, value in factors.items()}
   return percentages
	Definition of the function that will calculate and return as a result the percentage of factors that meet the pre-established criteria. Here the calculation of Equation 1 will occur.

gender_interest = ['Male','Female']	Assignment of the genders of interest, male or female.
for gender in gender_interest: factors = {f'{gender}EA': get_occurrences(dataframe, "Exits and Aquisitions", gender), f'{gender}BMEB':get_occurrences(dataframe, "Building and managing an effective board", gender), f'{gender}BGP':get_occurrences(dataframe, "Balancing growth vs profit", gender), f'{gender}GTA':get_occurrences(dataframe, "Growth through acquisitions", gender), f'{gender}OO':get_occurrences(dataframe, "Other options to venture capital: debt, venture debt & private equity", gender), f'{gender}PIPOP':get_occurrences(dataframe, "Pre IPO planning", gender), f'{gender}NA':get_occurrences(dataframe, "None of the above", gender) }	Assignment of the interest factor, in the case of "International Expansion", both to the assigned genre of interest and to each of the other interest factors, presented one by one. Running the get_occurrences function.
percentages = calculate_percentage(factors)	Calculates the percentage for each of the genders. Executing the function calculate_percentage from the attribution of factors.
for variable, percentage in percentages.items(): print(f"{variable}: {percentage:.3f}%")	It prints the results regarding the participation of each gender (Male or Female), for each of the factors of interest. The total of each of the genres must correspond to 100%,

	the base prerogative for the elaboration of the node in the RB.
`print(factors)`	Prints the specific amount of responses for each gender (Male or Female) that show interest both in International Expansion and in each of the factors of interest.

Figure 4. Genre standardization algorithm grouping the International Expansion together with each of the factors of interest.

Once the algorithms have been implemented, the next step is to obtain the results required for constructing the Bayesian Network (BN) through the standardization process using both algorithms. The first algorithm focuses on categorizing respondents based on their gender and their interest in International Expansion. The output of this algorithm can be observed in Table 2, which showcases the outcome of executing the algorithm.

Table 2

Genre and International Expansion

Gender	Sample	Option for International Expansion	Percentage of participation by option
Masculine	671	248	84.07%
Feminine	119	47	15.93%
Total Respondents	790	295	100%

The second algorithm aimed to standardize the data by grouping the Gender and International Expansion variables, along with the connection to each of the other factors of interest reported by the respondents. To improve the presentation of information, the extensive nomenclature of certain expansion factors will be represented by their initials: Exits and Acquisitions (EA), Building and managing an effective board (BMEB), Balancing growth vs profit (BGP), Growth through acquisitions (GTA), Other options to venture capital: debt, venture debt & private equity (OO), Pre IPO planning (PIPOP), and None of the above (NA). The outcome of executing this algorithm is displayed in Table 3.

Table 3

Gender, International Expansion and Interest Factors

Gender	Interest Factor	Sample	Option by factor and by International Expansion	Percentage of participation by option
Masculine	AND THE	671	78	13.66%
	BMEB	671	115	20.14%
	BGP	671	133	23.29%
	GTA	671	125	21.89%
	OO	671	80	14.01%
	PIPOP	671	39	6.83%
	AT	671	1	0.18%
	Total Factors	**671**	**571**	**100%**

Feminine	AND THE	119	19	15.58%
	BMEB	119	30	24.59%
	BGP	119	29	23.77%
	GTA	119	18	14.75%
	OO	119	18	14.75%
	PIPOP	119	8	6.56%
	AT	119	0	0%
	Total Factors	**119**	**122**	**100%**
Total Respondents		**790**	**693**	**100%**

Several considerations should be made regarding the results presented in the two tables. Firstly, it is important to note the number of records considered. Table 3 shows a higher number of observations because the options for the factors of interest are not mutually exclusive. This means that a respondent could select multiple factors, such as International Expansion, Exits and Acquisitions, Building and managing an effective board, and Balancing growth vs. profit. Another respondent might choose International Expansion along with Exits and Acquisitions, Other options to venture capital (debt, venture debt & private equity), Growth through acquisitions, and Balancing growth vs. profit.

Furthermore, although the other factors of interest are not mutually exclusive, the individual quantity of each factor should not exceed the number of options for International Expansion in Table 2. It should be noted that each gender would choose International Expansion as an option, but at least one of the factors of interest in Table 3. The results align with these expectations. In Table 2, 248 male respondents chose International Expansion, while in Table 3, the factor of interest with the highest number of selections was Balancing growth vs. profit (BGP), with 133 options. This indicates that out of the 248 respondents who selected International Expansion, 133 also chose Balancing growth vs. profit as one of their factors of interest.

Similarly, Table 2 for females shows 46 respondents selecting the option of International Expansion. In Table 3, the factor of interest with the highest number for the same gender is Building and managing an effective board (BMEB), with 30 respondents selecting this factor. This means that out of the 46 respondents who chose International Expansion, 30 also expressed interest in Building and managing an effective board.

These results provide valuable insights into the relationships between International Expansion and the other factors of interest for both male and female respondents.

The RB structure can now be established using the gathered information. To construct the network, we will utilize Netica software from Norsys Software Corp. This powerful and user-friendly software offers comprehensive capabilities for working with Bayesian Networks. It provides a seamless and intuitive interface for designing RBs. The connections between variables can be implemented using equations, individual probabilities, or data input through tabulations (Norsys - Netica Application, 2022).

The developed RB in this study employs a divergent type of connection, which incorporates the concept of conditional interdependence. The parent node, "International Expansion," directly influences the child node, "Factors of Interest" (Biedermann et al., 2005; Wang et al., 2013). The information obtained from Tables 2 and 3 is visualized in Figures 4 and 5, respectively.

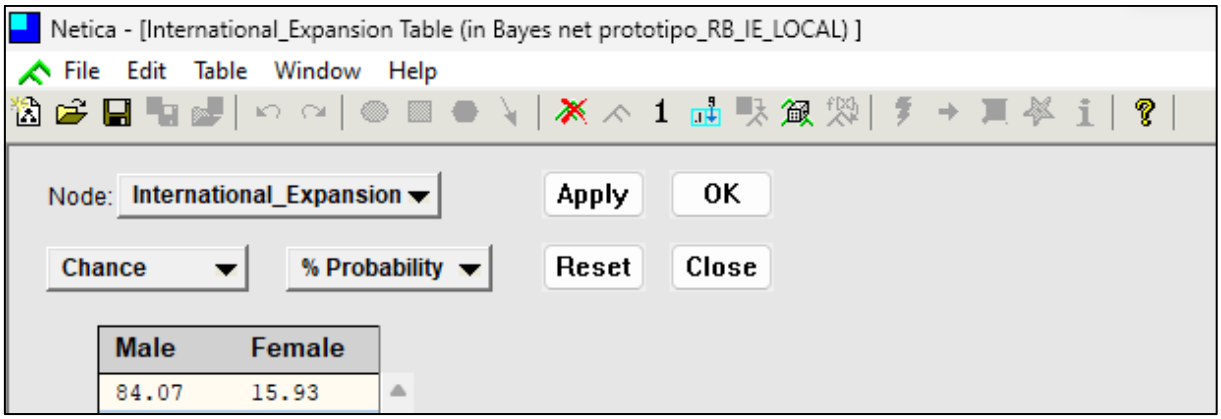

Figure 4. Gender participation percentage tabulation for the implementation of the International Expansion node in the Netica software .

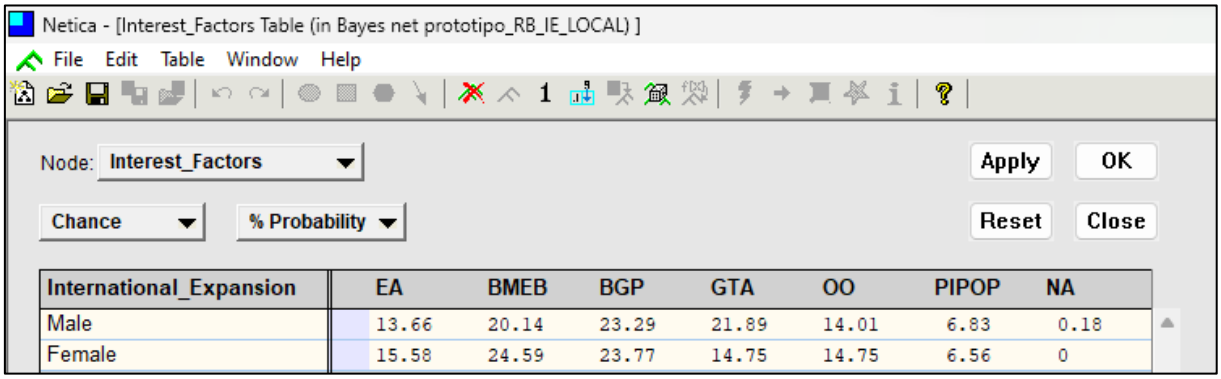

Figure 5. Tabulation of the percentage of gender participation on each of the interest factors for the implementation of the Interest Factors node in the Netica software .

After tabulating the information for the construction of the two nodes that will integrate the BN, it is possible to observe the complete BN in Figure 6.

Figure 6. Complete BN with International Expansion and Interest Factors nodes using Netica software .

Once the network has been constructed, simulations must be conducted to facilitate the analysis of the study. In this regard, the Bayesian Network (BN) will employ diagnostic reasoning, which is highly recommended for exploring future scenarios and simulating potential paths to achieve them (Biedermann et al., 2005; Korb & Nicholson, 2011; Abolbashari et al., 2018). By establishing the research development environment, it becomes feasible to examine the anticipated implications of the study and make note of any relevant findings derived from these results.

RESULTS ANALYSIS

Prior to analysing the Bayesian Network (BN), it is essential to consider certain aspects regarding the characterization of the respondents. Firstly, it should be noted that out of the total sample size of 1,578 respondents, only 790 participants (50.06%) provided their gender information in the questionnaire. Nearly half of the respondents chose not to disclose their gender. Furthermore, there was a notable disparity in the participation of different genders, with 671 male participants and 119 female participants, indicating a ratio of approximately 5.6 male respondents for every female respondent. This finding aligns with previous studies conducted by Oba and Fodio (2013), Zhang and Qu (2016), and Costa Júnior et al. (2023). Additionally, Table 3 reveals that among the 693 responses from male participants, only one individual claimed not to select any of the available options (NA). Given the minimal participation rate (0.18%), this particular option will not be included in the RB analyses.

The BN consists of two interconnected nodes: the parent node, "International Expansion," which encompasses the genre options considered in the study, and the child node, "Factors of Interest," which represents the other relevant factors as suggested by its name. These nodes are connected by a single link, resulting in a total of 16 conditional probabilities. The finalized RB structure is depicted in Figure 6, while Figure 7 illustrates the simulations of trigger factors within the network.

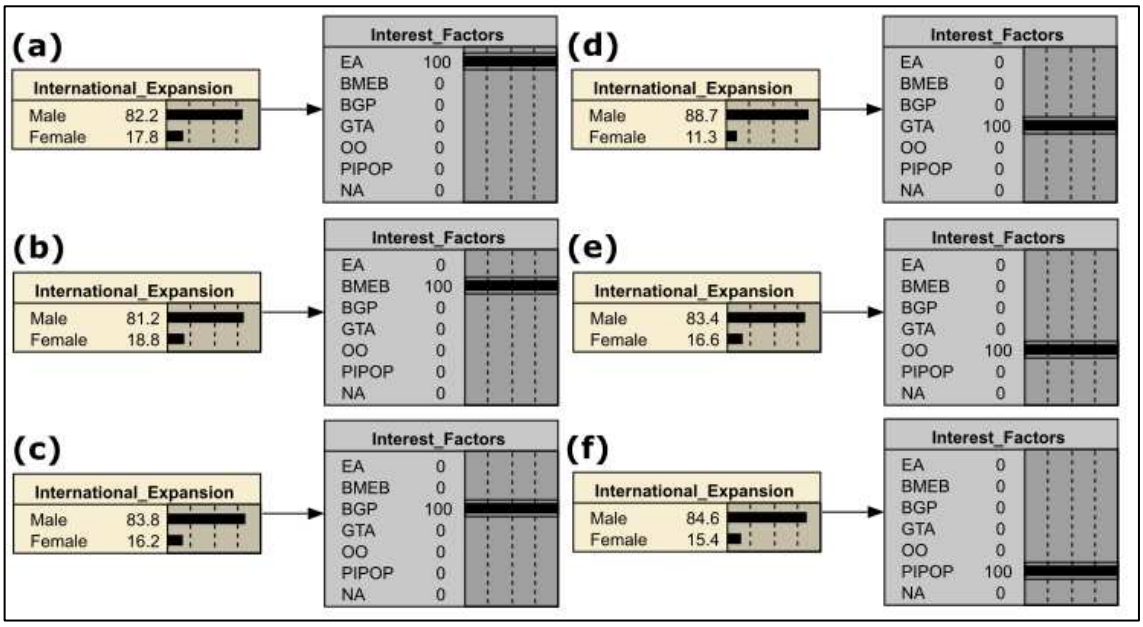

Figure 7. Simulation with triggers of the BN factors of interest in the Netica software .

By examining the simulation depicted in Figure 7(a), where the Exits Acquisitions parameter is triggered at 100% compared to the RB base state in Figure 6, we can observe a slightly diminished influence of this factor in relation to international expansion for male gender (84.1 → 82.2). Conversely, the female gender exhibits a heightened interest in this factor (15.9 → 17.8). Regardless of the gender of the manager, organizational direction should be a matter of concern. Research suggests that as organizations age, the likelihood of being acquired decreases (Pisoni & Onetti, 2018).

Turning our attention to the simulation in Figure 7(b), which illustrates a 100% increase in Building and managing an effective board (BMEB) compared to Figure 6, we observe a diminished impact of this factor on the male gender (84.1 → 81.2). On the other hand, the female gender displays a greater interest in this factor (15.9 → 18.8). Notably, this factor exerted the strongest influence on females while having the weakest effect on males. The

observed emphasis on gender diversity among females aligns with previous studies highlighting its significance in developed and emerging countries, where regulations have been implemented to ensure a certain proportion of women in top management boards (Nekhili & Gatfaoui, 2012; Terjesen et al., 2014; Ullah et al., 2019).

Taking note of the simulation presented in Figure 7(c), which exhibits a 100% increase in Balancing growth vs profit (BGP) compared to Figure 6, a slightly diminished influence on the male gender is observed (84.1 → 83.8). Conversely, the female gender demonstrates a higher inclination towards this factor (15.9 → 16.2). However, it is important to note that the probabilistic changes are moderate for both genders. Studies conducted by Chava and Puranandam (2010) and Kuo et al. (2014) have shown that a company's financial performance is significantly impacted by the incentives provided to top management.

Referring to the simulation depicted in Figure 7(d), which showcases a 100% increase in Growth through acquisitions (GTA) corresponding to Figure 6, the greatest influence is observed among all the factors analysed in relation to the male gender (84.1 → 88.7). On the other hand, the female gender exhibits the lowest influence across all factors analysed in the study (15.9 → 11.3). A study suggests that organizations tend to acquire fast-growing companies in their early stages of maturity (Pisoni & Onetti, 2018).

Upon examining the simulation illustrated in Figure 7(e), which demonstrates a 100% increase in Other options to venture capital: debt, venture debt & private equity (OO) relative to Figure 6, it is noteworthy that the male gender exhibits a slightly diminished influence (84.1 → 83.4). Conversely, the female gender portrays a slightly stronger inclination towards this factor (15.9 → 16.6). A study on venture capital organizations highlighted the challenges faced by female managers in securing venture capital financing compared to their male counterparts (Aidis & Schillo, 2017).

Regarding the final simulation (see Figure 7(f)), which exhibits a 100% trigger in Pre IPO planning (PIPOP) in comparison to Figure 6, a minimal but greater influence of the factor is observed among the male gender (84.1 → 84.6). Conversely, the female gender displays a minimal but weaker influence associated with this factor (15.9 → 15.4). Notably, this factor demonstrates the smallest disparity between the original RB state and the factor simulation for both genders, with a probabilistic difference of 0.5 favouring males and a 0.5 decrease for females. Even when companies possess equal financial resources and comparable qualifications, organizations led by female CEOs are less likely to attract IPO investors (Bigelow et al., 2012).

Based on these results, it is possible to draw several insights. Firstly, in terms of the factor "Exits Acquisitions," males show a slightly diminished interest in relation to international expansion, while females exhibit a heightened interest. Secondly, the factor "Building and managing an effective board" has a stronger influence on females compared to males, indicating the importance of gender diversity in top management boards. Thirdly, the factor "Balancing growth vs profit" has a moderate influence on both genders. Fourthly, "Growth through acquisitions" has the greatest influence on males, while females display the lowest influence across all factors analysed. Lastly, the factor "Other options to venture capital" shows a slightly stronger inclination among females compared to males. These findings provide insights into the different impacts of specific factors on strategic decision-making and highlight the challenges faced by female managers in securing venture capital financing and attracting IPO investors.

CONCLUSION

The present study aimed to analyse the factors influencing the decision-making process regarding the international expansion strategy of rapidly growing organizations, taking into account the perception of managers based on their gender. By employing the Bayesian Network

method, we were able to identify the key factors that influence these decision-making processes based on the gender classification (male or female) of the managers. The Bayesian Network facilitated the observation of simulations, enabling us to discern the perceptions of each gender regarding the factors that may impact the choices related to International Expansion. Consequently, we were able to ascertain whether these factors exhibited an increase or decrease in influence based on the perceptions of a specific gender.

In terms of gender influence, the factor that exhibited the least impact on the male gender was Building and managing an effective board (BMEB), followed, in decreasing order, by Exits and Acquisitions (EA), Other options to venture capital: debt, venture debt & private equity (OO), and Balancing growth vs profit (BGP). On the other hand, the factor that had the strongest positive influence on males was Growth through acquisitions (GTA). Pre IPO planning (PIPOP) had a slightly positive impact on gender. In contrast, the female gender had the lowest influence with the Growth through acquisitions (GTA) factor. Additionally, Pre IPO planning (PIPOP) had a slight negative influence on the women interviewed. The factor that had the greatest positive influence on the female gender was Building and managing an effective board (BMEB), followed, in descending order, by Exits and Acquisitions (EA), Other options to venture capital: debt, venture debt & private equity (OO), and Balancing growth vs profit (BGP), although to a lesser extent.

Thus, it is possible to infer that there were differences in management style between genders. The factors that have the most significant influence on male managers are Growth through acquisitions (GTA) and Pre IPO planning (PIPOP), which have a positive impact. On the other hand, female managers show less influence from the Growth through acquisitions (GTA) factor and a slight negative influence from Pre IPO planning (PIPOP). The factor that has the greatest positive influence on female managers is Building and managing an effective board (BMEB), followed by Exits and Acquisitions (EA), Other options to venture capital: debt, venture debt & private equity (OO), and Balancing growth vs profit (BGP), although to a lesser extent.

These findings suggest that gender may play a role in shaping management preferences and decision-making processes in relation to international expansion strategies: Based on the data analysed, females tend to exhibit a collaborative and inclusive approach, emphasizing teamwork and consensus-building. Conversely, males often adopt a more assertive and competitive style, prioritizing individual achievements and decision-making. Additionally, females tend to display a greater aversion to risk, preferring cautious and conservative strategies, whereas males are more inclined to embrace higher levels of risk and pursue aggressive growth strategies. Moreover, females tend to prioritize long-term sustainability and social responsibility in their decision-making, while males may prioritize short-term financial performance. Lastly, females tend to excel in communication and interpersonal skills, fostering effective relationships and promoting employee engagement, whereas males may place greater emphasis on their authority and assertiveness. These findings underscore the diverse perspectives and approaches that each gender brings to the field of strategic management, pointing to a more aggressive and short-term oriented style predominantly among males, whereas females seem to have a more conciliatory, long-term strategy style.

The present study offers valuable insights into the factors that potentially influence the decision-making process of managers in fast-growing organizations regarding international expansion strategies based on gender. It distinguishes itself from previous studies in several significant ways. Firstly, Adams et al. (2007) focused exclusively on CEO compensation in large American companies, without considering the unique context of fast-growing organizations. Secondly, Davis et al. (2010) specifically examined the impact of CEO gender on market orientation within the service sector. Thirdly, Oba & Fodio (2013) concentrated on the gender composition of boards as a predictor of financial performance. Fourthly, Aidis &

Schillo (2017) conducted research solely on venture capital fund portfolio organizations. Fifthly, Kaur & Singh (2019) explored CEO characteristics as explanatory factors for organizational performance but did not specifically investigate international expansion. Sixthly, Huang et al. (2020) focused on gender differences in communication and their implications for investors. Lastly, Costa Júnior et al. (2023) primarily investigated investor decision-making in fast-growing organizations located exclusively in London, thereby limiting the scope of analysis scenarios.

Despite its contributions, the study has several limitations that should be acknowledged. Firstly, the sample used in the study was limited to fast-growing organizations that participated in events held in Amsterdam, Berlin, London, New York, and Paris. This may restrict the generalizability of the findings, as organizational behaviour and managerial practices can vary across different regions, particularly in Eastern and emerging countries. Additionally, the study faced limitations regarding the dataset itself, with only slightly over 50% of respondents disclosing their gender. The study has also disregarded gender perception, focusing solely on biological gender. These limitations could potentially impact the obtained results and the representation of each gender group in the analysis. Future research utilizing alternative datasets from diverse locations, along with quantitative and/or qualitative studies involving respondents who did not disclose their gender, could provide further insights to corroborate or challenge the findings presented in this study. Furthermore, it would be beneficial to explore alternative modelling approaches, distinct from Bayesian Networks, using the same dataset to validate and complement the research contributions.

REFERENCES

Abolbashari, M. H., Chang, E., Hussain, O. K., & Saberi, M. (2018). Smart Buyer: A Bayesian Network modelling approach for measuring and improving procurement performance in organisations. *Knowledge-Based Systems*, *142*, 127–148. https://doi.org/10.1016/j.knosys.2017.11.032

Adams, S. M., Gupta, A., Haughton, D. M., & Leeth, J. D. (2007). Gender differences in CEO compensation: evidence from the USA. *Women in Management Review*, *22*(3), 208–224. https://doi.org/10.1108/09649420710743662

Aidis, R., & Schillo, R. S. (2017). Gender, leadership and venture capital: measuring women's leadership in VC firm portfolios. *International Journal of Gender and Entrepreneurship*, *9*(2), 110–135. https://doi.org/10.1108/ijge-08-2016-0027

Amal, M., Baffour Awuah, G., Raboch, H., & Andersson, S. (2013). Differences and similarities of the internationalization processes of multinational companies from developed and emerging countries. *European Business Review*, *25*(5), 411–428. https://doi.org/10.1108/ebr-08-2012-0048

Bertrand, M., & Schoar, A. (2003). Managing with Style: The Effect of Managers on Firm Policies. *The Quarterly Journal of Economics*, *118*(4), 1169–1208. https://doi.org/10.1162/003355303322552775

Biedermann, A., Taroni, F., Delemont, O., Semadeni, C., & Davison, A. C. (2005). The evaluation of evidence in the forensic investigation of fire incidents (Part I): an approach using Bayesian networks. *Forensic Science International*, *147*(1), 49–57. https://doi.org/10.1016/j.forsciint.2004.04.014

Bigelow, L., Lundmark, L., McLean Parks, J., & Wuebker, R. (2012). Skirting the Issues. *Journal of Management*, *40*(6), 1732–1759. https://doi.org/10.1177/0149206312441624

Buriticá, J. A., & Tesfamariam, S. (2015). Consequence-based framework for electric power providers using Bayesian belief network. *International Journal of Electrical Power & Energy Systems*, *64*, 233–241. https://doi.org/10.1016/j.ijepes.2014.07.034

Chari, M. D. R., Devaraj, S., & David, P. (2007). International diversification and firm performance: Role of information technology investments. *Journal of World Business*, *42*(2), 184–197. https://doi.org/10.1016/j.jwb.2007.02.004

Chava, S., & Purnanandam, A. (2010). CEOs versus CFOs: Incentives and corporate policies. *Journal of Financial Economics*, *97*(2), 263–278. https://doi.org/10.1016/j.jfineco.2010.03.018

Costa Júnior, J. F., Cabral, E. L. d. S., Barreto Junior, J. G., Niederauer Flores Severo, R. A., & Galdino de Araújo, A. (2023). The Use of a QFD-Fuzzy Approach to Support Investors' Decisions:. *Contextus – Revista Contemporânea de Economia e Gestão*, *21*, Artigo e82986. https://doi.org/10.19094/contextus.2023.82986

Coviello, N. (2015). Re-thinking research on born globals. *Journal of International Business Studies*, *46*(1), 17–26. https://doi.org/10.1057/jibs.2014.59

Dang, K. B., Windhorst, W., Burkhard, B., & Müller, F. (2019). A Bayesian Belief Network – Based approach to link ecosystem functions with rice provisioning ecosystem services. *Ecological Indicators*, *100*, 30–44. https://doi.org/10.1016/j.ecolind.2018.04.055

Davis, P. S., Babakus, E., Englis, P. D., & Pett, T. (2010). The Influence of CEO Gender on Market Orientation and Performance in Service Small and Medium-Sized Service Businesses. *Journal of Small Business Management*, *48*(4), 475–496. https://doi.org/10.1111/j.1540-627x.2010.00305.x

de Sá, A. G. C., Pereira, A. C. M., & Pappa, G. L. (2018). A customized classification algorithm for credit card fraud detection. *Engineering Applications of Artificial Intelligence*, *72*, 21–29. https://doi.org/10.1016/j.engappai.2018.03.011

Dikova, D., & Brouthers, K. (2015). International Establishment Mode Choice: Past, Present and Future. *Management International Review*, *56*(4), 489–530. https://doi.org/10.1007/s11575-015-0258-3

Efe, B., Kurt, M., & Efe, Ö. F. (2018). Hazard analysis using a Bayesian network and linear programming. *International Journal of Occupational Safety and Ergonomics*, *26*(3), 573–588. https://doi.org/10.1080/10803548.2018.1505805

García-García, R., García-Canal, E., & Guillén, M. F. (2022). Walking on thin ice: CEOS′ internationalization decisions in underperforming firms. *Long Range Planning*, 102243. https://doi.org/10.1016/j.lrp.2022.102243

Gemela, J. (2001). Financial analysis using Bayesian networks. *Applied Stochastic Models in Business and Industry*, *17*(1), 57–67. https://doi.org/10.1002/asmb.422

Golden, B. R., & Zajac, E. J. (2001). When will boards influence strategy? inclination × power = strategic change. *Strategic Management Journal*, *22*(12), 1087–1111. https://doi.org/10.1002/smj.202

Haddawy, P., Hasan, A. H. M. I., Kasantikul, R., Lawpoolsri, S., Sa-angchai, P., Kaewkungwal, J., & Singhasivanon, P. (2018). Spatiotemporal Bayesian networks for malaria prediction. *Artificial Intelligence in Medicine*, *84*, 127–138. https://doi.org/10.1016/j.artmed.2017.12.002

Heckerman, D., Geiger, D., & Chickering, D. M. (1995). *Machine Learning*, *20*(3), 197–243. https://doi.org/10.1023/a:1022623210503

Heckerman, D. (2008). A Tutorial on Learning with Bayesian Networks. In *Innovations in Bayesian Networks* (p. 33–82). Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-540-85066-3_3

Huang, L., Joshi, P., Wakslak, C., & Wu, A. (2020). Sizing Up Entrepreneurial Potential: Gender Differences in Communication and Investor Perceptions of Long-Term Growth and Scalability. *Academy of Management Journal*. https://doi.org/10.5465/amj.2018.1417

Hutzschenreuter, T., Voll, J. C., & Verbeke, A. (2011). The Impact of Added Cultural Distance and Cultural Diversity on International Expansion Patterns: A Penrosean Perspective. *Journal of Management Studies*, *48*(2), 305–329. https://doi.org/10.1111/j.1467-6486.2010.00966.x

Hymer, S. H. (1960). *The international operations of national firms, a study of direct foreign investment* [Thesis, Massachusetts Institute of Technology]. http://hdl.handle.net/1721.1/27375

Jiang, G. F., & Holburn, G. L. F. (2018). Organizational performance feedback effects and international expansion. *Journal of Business Research*, *90*, 48–58. https://doi.org/10.1016/j.jbusres.2018.04.034

Julia Flores, M., Nicholson, A. E., Brunskill, A., Korb, K. B., & Mascaro, S. (2011). Incorporating expert knowledge when learning Bayesian network structure: A medical case study. *Artificial Intelligence in Medicine*, *53*(3), 181–204. https://doi.org/10.1016/j.artmed.2011.08.004

Kaur, R., & Singh, B. (2019). Do CEO characteristics explain firm performance in India? *Journal of Strategy and Management*, *12*(3), 409–426. https://doi.org/10.1108/jsma-02-2019-0027

Kita, E., Harada, M., & Mizuno, T. (2012). Application of Bayesian Network to stock price prediction. *Artificial Intelligence Research*, *1*(2), 171. https://doi.org/10.5430/air.v1n2p171

Korb, K. B., & Nicholson, A. E. (2011). *Bayesian Artificial Intelligence* (2ª ed.). CRC Press.

Kotabe, M., Srinivasan, S. S., & Aulakh, P. S. (2002). Multinationality and Firm Performance: The Moderating Role of R&D and Marketing Capabilities. *Journal of International Business Studies*, *33*(1), 79–97. https://doi.org/10.1057/palgrave.jibs.8491006

Kuo, H.-C., Wang, L.-H., & Lin, D. (2014). CEO Traits, Corporate Performance, and Financial Leverage. *International Journal of Economics and Finance*, *7*(1). https://doi.org/10.5539/ijef.v7n1p68

Kwan, M., Chow, K.-P., Law, F., & Lai, P. (2008). Reasoning About Evidence Using Bayesian Networks. In *IFIP — The International Federation for Information Processing* (p. 275–289). Springer US. https://doi.org/10.1007/978-0-387-84927-0_22

Lau, C. L., Mayfield, H. J., Lowry, J. H., Watson, C. H., Kama, M., Nilles, E. J., & Smith, C. S. (2017). Unravelling infectious disease eco-epidemiology using Bayesian networks and scenario analysis: A case study of leptospirosis in Fiji. *Environmental Modelling & Software*, *97*, 271–286. https://doi.org/10.1016/j.envsoft.2017.08.004

Lazkano, E., Sierra, B., Astigarraga, A., & Martínez-Otzeta, J. M. (2007). On the use of Bayesian Networks to develop behaviours for mobile robots. *Robotics and Autonomous Systems*, *55*(3), 253–265. https://doi.org/10.1016/j.robot.2006.08.003

Lee, S. (2008). Internationalization of US multinational hotel companies: Expansion to Asia versus Europe. *International Journal of Hospitality Management*, *27*(4), 657–664. https://doi.org/10.1016/j.ijhm.2007.09.002

Luo, Y., & Tung, R. L. (2007). International expansion of emerging market enterprises: A springboard perspective. *Journal of International Business Studies*, *38*(4), 481–498. https://doi.org/10.1057/palgrave.jibs.8400275

Mauri, A., Song, S., & Neiva de Figueiredo, J. (2017). Determinants of Corporate International Expansion Beyond the Home Region: An Empirical Examination of U.S. Multinational Enterprises Expansion to Europe and Asia-Pacific. *Global Strategy Journal*, *7*(4), 400–426. https://doi.org/10.1002/gsj.1155

Munya, P., A. Ntuen, C., H. Park, E., & H. Kim, J. (2015). A Bayesian Abduction Model for Extracting Most Probable Evidence to Support Sense Making. *International Journal of Artificial Intelligence & Applications*, *6*(1), 1–20. https://doi.org/10.5121/ijaia.2015.6101

Nassaji, H. (2015). Qualitative and descriptive research: Data type versus data analysis. *Language Teaching Research*, *19*(2), 129–132. https://doi.org/10.1177/1362168815572747

Nekhili, M., & Gatfaoui, H. (2012). Are Demographic Attributes and Firm Characteristics Drivers of Gender Diversity? Investigating Women's Positions on French Boards of Directors. *Journal of Business Ethics*, *118*(2), 227–249. https://doi.org/10.1007/s10551-012-1576-z

Nielsen, B. B., Asmussen, C. G., & Weatherall, C. D. (2017). The location choice of foreign direct investments: Empirical evidence and methodological challenges. *Journal of World Business*, *52*(1), 62–82. https://doi.org/10.1016/j.jwb.2016.10.006

Norsys - Netica Application. (2022). Norsys Software Corp. - Bayes Net Software. https://www.norsys.com/netica.html

Oba, V. C., & Fodio, M. I. (2013). Boards' Gender Mix as a Predictor of Financial Performance in Nigeria: An Empirical Study. *International Journal of Economics and Finance*, *5*(2). https://doi.org/10.5539/ijef.v5n2p170

Pisoni, A., & Onetti, A. (2018). When startups exit: comparing strategies in Europe and the USA. *Journal of Business Strategy*, *39*(3), 26–33. https://doi.org/10.1108/jbs-02-2017-0022

Ruiz, C. F., Bonilla, R., Chavarro, D., Orozco, L. A., Zarama, R., & Polanco, X. (2009). Efficiency measurement of research groups using Data Envelopment Analysis and Bayesian networks. *Scientometrics*, *83*(3), 711–721. https://doi.org/10.1007/s11192-009-0122-y

Runfola, A., & Guercini, S. (2013). Fast fashion companies coping with internationalization: driving the change or changing the model? *Journal of Fashion Marketing and Management: An International Journal*, *17*(2), 190–205. https://doi.org/10.1108/jfmm-10-2011-0075

Saunders, M. N. K., Lewis, P., & Thornhill, A. (2019). *Research Methods for Business Students*. Pearson Education, Limited.

Silva, L. A., Cortez, A. E. G., Sousa Neto, M. V., & Araújo, A. G. (2021a). Bayesian Networks as Support to Project Management: Optimization of Decision-Making of a Project Developed through the Life Cycle Canvas Model. *European Journal of Scientific Research*, *158*(4), 274–287. https://www.researchgate.net/publication/350655487_Bayesian_Networks_as_Support_to_Project_Management_Optimization_of_Decision-Making_of_a_Project_Developed_through_the_Life_Cycle_Canvas_Model

Silva, L. A., Cortez, A. E. G., Costa Júnior, J. F. D., & Araújo, A. G. (2021b). Influência das importações e exportações na geração de empregos e na atuação das empresas: Aplicação de uma Rede Bayesiana junto ao setor têxtil do município de São Bento-PB. In *XXIV SEMEAD Seminários em Administração*. Faculdade de Economia, Administração, Contabilidade e Atuária da Universidade de São Paulo (FEA-USP).

Silva, L. A., Costa Júnior, J. F. D., & Araújo, A. G. (2022). INTERNATIONAL EXPANSION STRATEGY IN FAST-GROWING BUSINESSES: Using Bayesian Networks to identify influencing factors. In XXV SEMEAD Seminários em Administração. Faculdade de Economia, Administração, Contabilidade e Atuária da Universidade de São Paulo (FEA-USP).

Simeon, R. (2001). Top team characteristics and the business strategies of japanese firms. *Corporate Governance: The international journal of business in society*, *1*(2), 4–12. https://doi.org/10.1108/14720700110394344

Stritih, A., Rabe, S.-E., Robaina, O., Grêt-Regamey, A., & Celio, E. (2020). An online platform for spatial and iterative modelling with Bayesian Networks. *Environmental Modelling & Software*, *127*, 104658. https://doi.org/10.1016/j.envsoft.2020.104658

Taroni, F., Biedermann, A., Garbolino, P., & Aitken, C. G. G. (2004). A general approach to Bayesian networks for the interpretation of evidence. *Forensic Science International*, *139*(1), 5–16. https://doi.org/10.1016/j.forsciint.2003.08.004

Terjesen, S., Aguilera, R. V., & Lorenz, R. (2014). Legislating a Woman's Seat on the Board: Institutional Factors Driving Gender Quotas for Boards of Directors. *Journal of Business Ethics*, *128*(2), 233–251. https://doi.org/10.1007/s10551-014-2083-1

Ullah, I., Fang, H., & Jebran, K. (2019). Do gender diversity and CEO gender enhance firm's value? Evidence from an emerging economy. *Corporate Governance: The International Journal of Business in Society*, *20*(1), 44–66. https://doi.org/10.1108/cg-03-2019-0085

Wang, J., Gu, X., & Huang, T. (2013). Using Bayesian networks in analysing powerful earthquake disaster chains. *Natural Hazards*, *68*(2), 509–527. https://doi.org/10.1007/s11069-013-0631-0

Yang, S., Kher, R., & Newbert, S. L. (2020). What signals matter for social startups? It depends: The influence of gender role congruity on social impact accelerator selection decisions. *Journal of Business Venturing*, *35*(2), 105932. https://doi.org/10.1016/j.jbusvent.2019.03.001

Zhang, Y., & Qu, H. (2016). The Impact of CEO Succession with Gender Change on Firm Performance and Successor Early Departure: Evidence from China's Publicly Listed Companies in 1997–2010. *Academy of Management Journal*, *59*(5), 1845–1868. https://doi.org/10.5465/amj.2014.0176