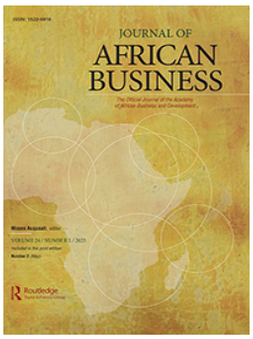

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ABSTRACT

The structure and types of social networks created by entrepreneurs are important factors influencing business performance. This study examined how social networks influence the performance of agribusinesses owned by young women, as well as the moderating effects of business environments on these relationships. Data were collected from a sample of 365 young women agri-food processing business owners in Benin. Moderated multiple regression methods were used to test the suggested hypotheses including the interaction effects of business environment. Network size, network centrality, competitive network, and supportive network each has a positive effect on the performance of agribusinesses owned by young women. Network size and network centrality are more beneficial when barriers in business environment are low than when they are high. The two-way interactions of network types (competitive and supportive) and business environment on business performance were not significant. Drawing on social capital theory, this study provides a contingent perspective of network size and network centrality in a developing country context. The findings of the study provide useful guidelines for young women agribusiness owners on which social ties to develop. Rules and regulations on taxes need to be streamlined and made more flexible.

KEYWORDS

Women entrepreneurs; agribusiness; social capital; business performance; developing countries

1. Introduction

Social capital theory can explain the performance of entrepreneurs (Inkpen & Tsang, 2005; Lin, 2008). Social capital can be defined as resources integrated into social networks. It refers to the support of relationships with individuals and organizations for entrepreneurial actions by means of real or virtual resources that can be developed through relationships or social ties (Adler & Kwon, 2002; Inkpen & Tsang, 2005). In the social capital literature, personal (social) networks are considered as an essential asset for identifying opportunities and accessing the resources necessary for business development (Bliemel & Maine, 2008; Hoang & Yi, 2015). According to Bhattacharyya and

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Ahmad (2010), in addition to the traditional factors of production – land, labor, resources, and management – any successful business requires the competent use of networks. By understanding the network of relationships in which entrepreneurs are embedded, their business performance can be better understood (Gulati et al., 2000). For example, Capelleras and Greene (2008) state that support from potential suppliers and customers is beneficial for decision speed as well as for the subsequent growth of the business. Many studies have shown the importance of networks in the entire process of entrepreneurship development (Das & Goswami, 2019; Hite & Hesterly, 2001). Furthermore, the structure and types of networks created by entrepreneurs influence their performance (Kuada, 2009; Porter, 2000).

Thus, entrepreneurs need knowledge, resources, and support from external actors such as relatives, friends, as well as other entrepreneurs and supporting institutions. This is particularly related to entrepreneurs in developing countries because they often face challenges to attain the required resources and support to improve their business performance (Glonti et al., 2016; Kinkingninhoun-Mêdagbé et al., 2010). Many studies on women entrepreneurs operating in developing contexts highlight in particular this type of situation (Amine & Staub, 2009; De Vita et al., 2014). According to Al Dajani and Marlow (2010) and Roomi (2013), the business environment presents barriers to women entrepreneurs in the form of infrastructural instability, environmental risks, and governance limitations. These barriers control and limit the performance of women entrepreneurs. Networks, therefore, are extremely important to women entrepreneurs operating in developing countries for identifying opportunities and accessing reliable information and resources necessary for business development.

The objective of this study was to examine how social networks influence the performance of agribusinesses owned by young women, as well as the moderating effects of business environments on these relationships. Indeed, an accelerated and sustained development of agriculture is the key to economic development as well as poverty and youth unemployment reduction in developing countries (Babu & Shishodia, 2017; Collier & Dercon, 2014). In Benin, agriculture accounts for 20% of GDP and employs over 50% of the workforce (aged 15–64) (EEAS, 2018). Various initiatives have been implemented in many developing countries to promote entrepreneurship among young people in agribusiness. In fact, entrepreneurship appears as one of the solutions to poverty and unemployment among young people (Hem, 2013; Jemal, 2017). However, young people, in particular, women who are starting up businesses, often are unable to sustainably grow their businesses (Cerdan et al., 2003; LAB, 2016). Many scholars have shown that women entrepreneurs are more likely to underperform in their businesses than men (Kepler & Shane, 2007; Vossenberg, 2013). This is particularly evident in developing contexts where business performance is a major challenge for most women entrepreneurs (Aliyu, 2013; Vossenberg, 2013). However, international attention has been given to the important role that female entrepreneurship plays in stimulating economic development, creating employment, and alleviating poverty (De Vita et al., 2014; GEM, 2017). According to FAO (2018), most of the women engaged in agribusiness in sub-Saharan Africa regions mainly work in the agri-food sector, and the majority of them (more than 60%) are young people (aged 15–34 years).

This study contributes to research efforts aimed at understanding the influence of social networks on business performance in developing contexts. Unlike most of the

existing studies that assessed the relationship between entrepreneurs' social networks and performance by testing various dimensions (e.g. Das & Goswami, 2019; Li & Zhang, 2007; Mozumdar et al., 2019; Prajapati & Biswas, 2011), the present research introduced a strategic contextual variable – business environment – to explore its moderating effects on social network–performance relationship, leading to a richer theoretical model. This provides an additional understanding of the multiple findings of previous research.

The paper is organized as follows: Theoretical framework and hypotheses are presented in section 2. In section 3, the methods used for the study are described. The results are presented in section 4 followed by the discussion in section 5. Section 6 presents conclusions, limitations, and suggestions for future research.

2. Low-income country context and women business owners

Social capital is considered to have a positive influence on business performance, and social ties are presented as beneficial to entrepreneurs since they provide access to key resources such as loans, information, and business orientation advice (Roomi, 2013). However, according to Bruton et al. (2013), strategic actions and organizational processes in emerging economies differ from those in developed economies. Activities of individuals can be influenced by the environment (De Vita et al., 2014). The business environment, defined as the environment in which business activities occur (Ward et al., 1995). It can create barriers (infrastructure instability, environmental risks, and governance limitations) when it is characterized by poverty, uncertainty, and changing conditions (Al Dajani & Marlow, 2010; De Vita et al., 2014; Roomi, 2013). Entrepreneurship, including resource-collecting social capital, placed in such a resource-poor environment raises the question of how entrepreneurs in such an environment perform and how social capital supports them. This study responds to the invitation to entrepreneurship scholars to focus on entrepreneurial research in developing countries (Bruton et al., 2013; Kim & Li, 2014).

More specifically, against the background of social capital's resource gathering, this question appeals to a specific group of entrepreneurs, namely women entrepreneurs in developing countries. Women business owners encounter many challenges in developing countries. Women entrepreneurs in such situations face significant resource constraints (De Vita et al., 2014), socio-cultural obstacles (Vossenberg, 2013), and institutional risk and uncertainty because of poor institutional frameworks supporting economic activity (Zoogah et al., 2015). From this perspective, these women business owners appear to be challenged by obstacles to access fundamental agency elements of entrepreneurship (Fuller, 2000).

3. Theoretical framework and hypotheses

3.1. Business performance

According to Lebas and Euske (2007), business performance is defined in terms of financial indicators or non-financial indicators. These sets of indicators offer information on the level of accomplishment of objectives and results. Business performance is measured using subjective as well as objective measures (Harris, 2001;

Rauch et al., 2009). Although subjective and objective measures are used by scholars for measuring business performance, subjective measures are more frequently used (Aydiner et al., 2019; Kraus et al., 2012; Santos & Brito, 2012). Despite various advantages in favor of objective measures, it is difficult to obtain data on objective performance indicators for the whole sample of entrepreneurs or firms under investigation (Hult et al., 2008). Because of these real and potential difficulties, researchers have reliably used subjective measures for measuring performance in their research. The present study used subjective measures. Many scholars have shown both the validity and the reliability of subjective measures in various contexts (Matchaba-Hove & Goliath, 2016; Mozumdar et al., 2019; T. D. Wall et al., 2004).

Business performance is considered as a multidimensional construct (Matchaba-Hove & Goliath, 2016; Papke-Shields & Malhotra, 2001). Organizational profitability, production growth, level of innovation, return on assets, and customer satisfaction are the main dimensions that are used to measure business performance. Furthermore, each dimension has a related weight that indicates its relative importance (Garg et al., 2004). In the literature, different methods are used to define weights. The three most used are as follows: expert judgment (Brooks et al., 2005; Moss et al., 2001), arbitrary choice of equal weight (O'Brien et al., 2004; Patnaik & Narayanan, 2009), and statistical methods (Cutter et al., 2003; Thornton et al., 2008). In this study, a statistical method was used to assign weights to business performance dimensions, because of limitations of other methods.

3.2. Social network and business performance

Networking is an activity that allows entrepreneurs to learn about new business opportunities (Birley et al., 1991). According to Aldrich and Zimmer (1986), entrepreneurs' networks are their personal relationships with external actors. The network maintains long-term contact between business owners and external actors to access various forms of social capitals such as information, moral support, and assistance, as well as economic resources (Birley et al., 1991; Dubini & Aldrich, 1991). In the present study, the personal relationships of the young women agribusiness owners will be considered. Indeed, the owner-manager is the main component of a small business (T. Wall & Bellamy, 2019). The structures and types of social networks influence the complex mechanisms by which various forms of social capital are accessed and mobilized (Mishra, 2020).

3.2.1. Network structures and business performance

The size of the network, the density of the network, and the centrality of the network generally constitute the structure of a business network. The size of the network indicates the number of relationships maintained by the entrepreneur within the network. It is the most common measure of network integration (Hoang & Yi, 2015). The greater the number of links that the entrepreneur is able to form, the more likely she or he is to gain access to information (practical knowledge, advice, and guidelines) and to the various types of precious resources such as capital (Burt, 2000). The benefits that entrepreneurs can achieve through network integration are evident in the identification and exploitation of opportunities. According to Li and Zhang (2007), the size of the business network has a positive relationship with sales growth.

The density of the network represents the number of links that the entrepreneur maintains within the network compared to the total possible size of the network (Hansen, 1995). It is recognized that a dense network means close links between entrepreneurs and external actors (Greve, 1995). The density of the network has a positive effect on the performance of small businesses (Das & Goswami, 2019). Network links significantly improve business performance (Saha & Banerjee, 2015). High-density networks improve entrepreneurs' access to resources necessary to run their business (Ren et al., 2009). According to Jenssen and Koenig (2002), affiliation in networks creates strong ties, which are important for the entrepreneur to obtain information and financial resources.

Centrality indicates the close links of an entrepreneur with his/her network partners in terms of speed, superiority, transaction, and control of resources and information (Farina, 2008). Several studies have assessed the effect of network centrality on business performance. The results of these studies are not unequivocal. The results of undefined study indicated that a central position in the network is likely to increase business performance. A positive relationship was established between centrality and business performance by Farina (2008). Das and Goswami (2019), in their study on assessing the potential effect of networks on the performance of small businesses, found that network centrality has a positive effect on the performance of these businesses. However, studies have shown a negative impact of network centrality on business performance (Batjargal, 2000; Rowley et al., 2000). Based on these elements, the following assumptions have been suggested:

Hypothesis 1A: There is a positive relationship between network size and the performance of agribusinesses owned by young women.

Hypothesis 1B: There is a positive relationship between network density and the performance of agribusinesses owned by young women.

Hypothesis 1C: There is a positive relationship between network centrality and the performance of agribusinesses owned by young women.

3.2.2. Network types and business performance

Competitive and supportive networks are generally the network types of an entrepreneur. Competition is identified as an important factor in improving the innovation and economic growth of entrepreneurs (Porter, 2000). According to Schmitz and Nadvi (1999), entrepreneurs are well aware of the strategy of competitors and offer different choices to customers in the same market, which leads to unscrupulous production practices, the use of inferior and inexpensive raw materials, the creation of obstacles in the flow of knowledge and ultimately to a decline in performance. Thus, competition can increase certain harmful practices to the consumers' health. Das and Goswami (2019) have shown that the competitive network has no significant effect on the performance of small businesses in the North East of India.

Supportive networks consist of government institutions, non-governmental organizations (NGOs), financial institutions, research institutions, training institutions, cooperatives, etc., which help businesses in a given sector (Ali, 1995). These networks could give

entrepreneurs access to valuable information and resources allowing the identification of new business opportunities (Kuada, 2009; Maas et al., 2014). For example, contact between women entrepreneurs and churches in Ghana improves business performance through access to information and bank loans (Kuada, 2009). In the context of young women agribusiness owners in Benin, the following hypotheses have been formulated:

Hypothesis 2A: There is a negative relationship between competitive network and the performance of agribusinesses owned by young women.

Hypothesis 2B: There is a positive relationship between supportive network and the performance of agribusinesses owned by young women.

3.3. Moderating effect of business environment

In operational terms, the business environment is defined as the political, economic, institutional, and regulatory environment in which business is run in a country. It designates all the regulatory and legislative provisions put in place by policymakers to ensure management of entrepreneurs' activities. Accordingly, a strong business environment means a good regulation that facilitates and simplifies procedures for entrepreneurs, and this is the responsibility of policymakers. Thus, the business environment can generate obstacles or opportunities for entrepreneurs according to the contexts and sectors of activity (Ward et al., 1995). According to Amine and Staub (2009), the business environment in developing countries is often characterized by difficult, unpredictable, and changing conditions, which increases uncertainty and hindrances for entrepreneurs, especially women. For Acs et al. (2011), physical and institutional conditions are the major sources of hindrances in these contexts. For these authors, infrastructural instability and governance limitations are among the challenges that women and men entrepreneurs meet in their business. For example, the low quality of electricity and communication technologies, as well as corruption and ineffective government gender policies are among the biggest challenges for entrepreneurs, especially women (Acs et al., 2011).

The business environment may moderate the relationship between social networks and the performance of agribusinesses owned by young women. Thus, the influence of business environment on social networks-business performance relationship might also be unfavorable. The present study suggested investigating the business performance implications of an appropriate fit between social networks of young women agribusiness owners and their business environment. To date, evidence of the moderating effects of the business environment on the relationship between social networks and the performance of agribusinesses owned by young women in developing contexts is lacking. It might be suggested that social networks of these entrepreneurs will be more strongly associated with low level of performance when barriers in business environment are high than when they are low. In contrast, in favorable business environment, social networks will be strongly associated with high level of business performance for these entrepreneurs. Based on these elements, the present study developed the following hypotheses:

Hypothesis 3A: The business environment negatively moderates the relationship between network structure and performance of agribusinesses owned by young women.

Hypothesis 3B: The business environment negatively moderates the relationship between network types and the performance of agribusinesses owned by young women.

Figure 1 presents the conceptual framework of the study.

4. Methods

4.1. Sampling and data collection procedure

The case of young women working in the agri-food processing industry in Benin was used for this study. A large number of young women have been producing food products based on various raw materials for a long time in their own small units. This business is a substantial source of revenue for these entrepreneurs (CFSI, 2014; Onibon, 2019). Most of these entrepreneurs work in the informal sector. In Benin, informality in the agribusiness sector is high as nearly half of agribusinesses are not registered with any formal government entity, and only 30% comply with tax regulations (Thoto et al., 2021).

A random sampling was performed to select respondents. Data were collected from a sample of 365 young women entrepreneurs. This sample was selected from 2631 women entrepreneurs identified (after eliminating overlapping names) with assistance from the organizations supporting agribusiness, NGOs, and various associations that support women in the agri-food processing industry in Benin. Only women between 15 and 40 years old were included in the sample. In fact, 95% of working women (15–64

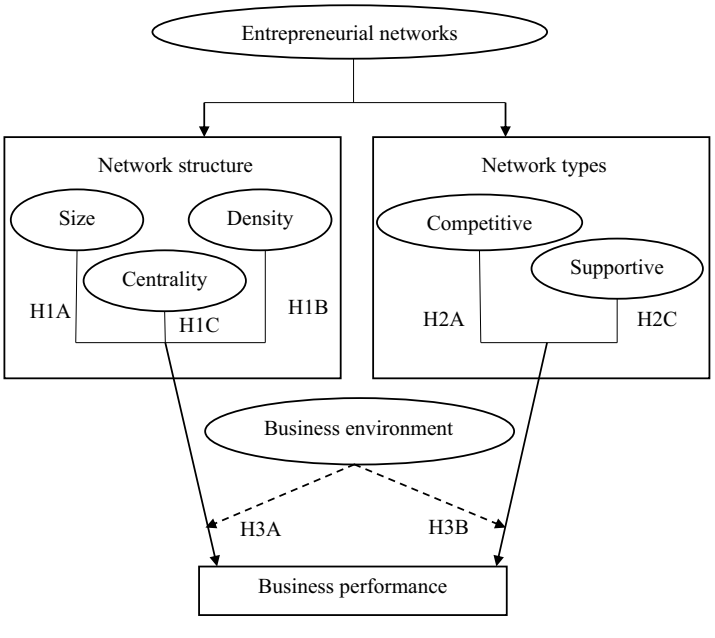

Figure 1. Conceptual framework of the study.

years) are between 15 and 40 years old in Benin (INSAE, 2016). A sample size of 330 is, therefore, adequate for a margin of error of 5% (Yamane, 1967). The sample size of the study represents about 15% of the total population. The distribution of this sample was made in proportion to the size of the women entrepreneurs of each region included in the sample frame (Figure 2). The sample included both formal and informal businesses.

Data were collected based on face-to-face interviews using a structured questionnaire. The questionnaire focused on the socio-demographic characteristics of the respondents and their businesses (age, education level, business experience, business training, and financial capital), social networks, obstacles encountered in the business environment and business performance. Oral consent statement was used. The consent process occurred during the face-to-face interviews.

4.2. Measures

4.2.1. Dependent variable

The dependent variable used in regression analyses was business performance. Due to the fact that young women agri-food processing business owners might not be able to provide reliable data, the collection of these data was done based on subjective measures. Thus, business performance data were collected by using five items referring to three dimensions of performance: financial ("My unit had a higher profit compared to other agri-food processing units"), economic (The total volume of my unit's production has increased"), and operational ("I was satisfied with the price that I got from my customers," "Customers were satisfied with my products," "My unit had better products on offer compared to other agri-food processing units") (Matchaba-Hove & Goliath, 2016; Mozumdar, 2018). Respondents were asked to rank the level of agreement with the items by using a 5-point Likert scale ranging from one (completely disagree) to five (completely agree) (Bryhni et al., 2002). Business performance showed a high reliability (Cronbach's $\alpha = 0.75$).

4.2.2. Independent variables

Independent variables were social network and hindrances in business environment. Data on social network were collected in relation to network size, network density, network centrality, as well as competitive and supportive networks. An entrepreneur's network includes family, friends, government institutions, financial institutions, raw material suppliers, customers, competitors, and other support institutions. To collect data on network size, respondents were asked about the number of people with whom they often interacted for all these categories of actors.

Data on network density were collected using a scale adapted from Frazier (2000). This scale was also used by Prajapati and Biswas (2011) and Das and Goswami (2019). The scale includes 10 items covering trust and reliability of information with family members, friends, customers, competitors, raw material suppliers, and support institutions (government institutions, financial institutions, NGOs, etc.). The items were related to confidence and reliability on customers, competitors, support institutions, family members and friends, and raw material suppliers. Respondents were asked to rank the level of agreement with the items by using a 5-point Likert scale ranging from one

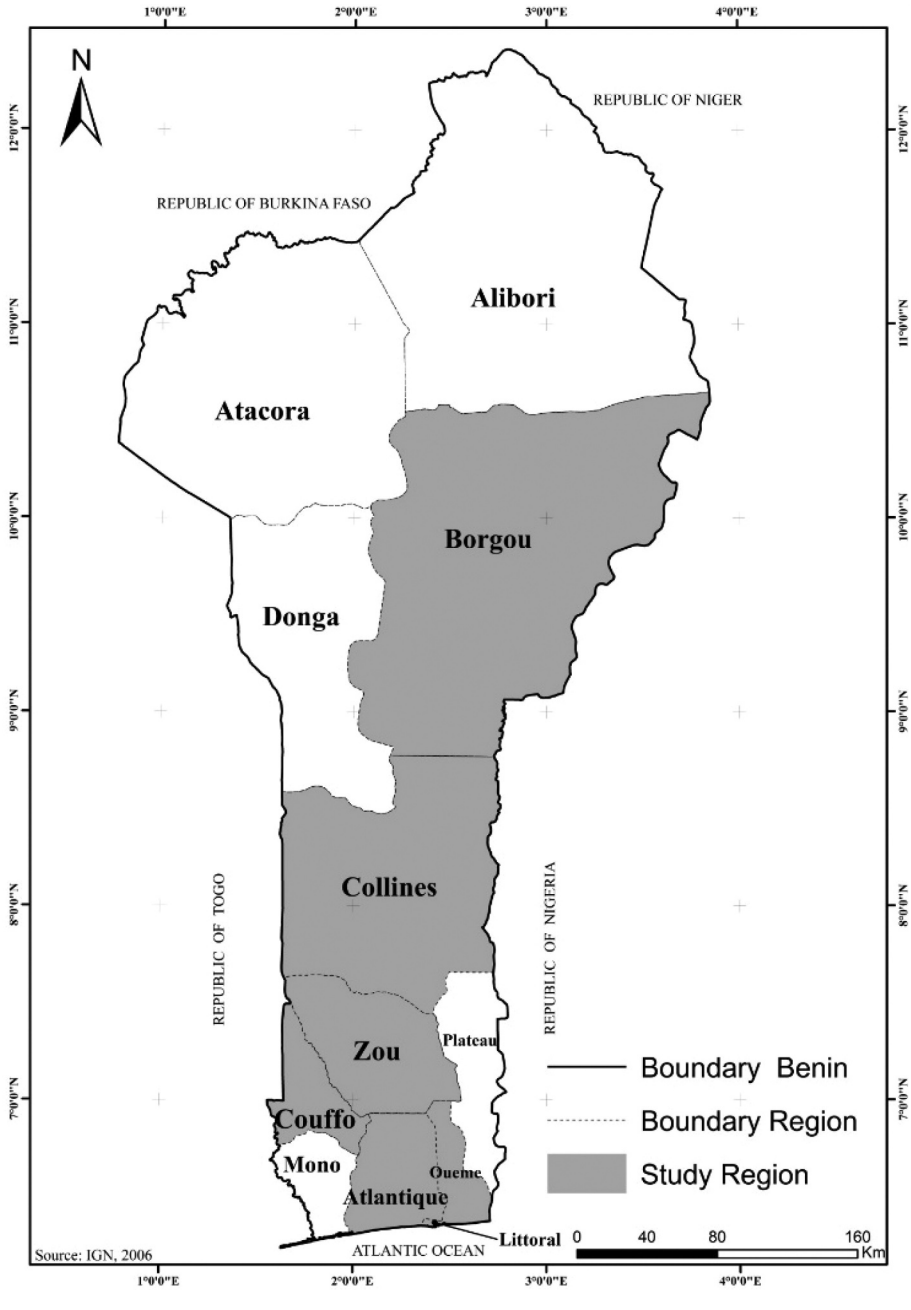

Figure 2. Map of the study area.

(completely disagree) to five (completely agree). The network density showed very high reliability (Cronbach's $\alpha = 0.92$).

Data on centrality were collected using a scale adapted from Frazier (2000). Several studies have also used this scale (Das & Goswami, 2019; Prajapati & Biswas, 2011). The scale includes six items covering the frequency of resource and

information exchanges with raw material suppliers, customers, and competitors. Respondents were asked to rank the level of agreement with the items by using a 5-point Likert scale. Network centrality showed a very high reliability (Cronbach's $\alpha = 0.85$).

Data on competitive networks were collected using a scale adapted from Prajapati and Biswas (2011). The scale includes five items covering cheating by competitors, poaching customers and employees, price competition and obtaining information. Respondents were asked to rank the level of agreement with the items by using a 5-point Likert scale. Competitive network showed very high reliability (Cronbach's $\alpha = 0.83$).

Data on supportive networks were also collected using a scale adapted from Prajapati and Biswas (2011). The scale includes four items covering networks with NGOs, financial institutions, and government institutions. Respondents were asked to rank the level of agreement with the items by using a 5-point Likert scale. Supportive network showed very high reliability (Cronbach's $\alpha = 0.83$).

Data on hindrances in business environment were collected by using two items reflecting infrastructural instability ("Policies and programs in terms of electricity and information technology do not promote the business environment") and government rules and regulations ("Rules and regulations of the government in terms of registration and taxation put me in difficulty") (Mozumdar, 2018; Rodríguez-Gutiérrez et al., 2015). These items consider obstacles that both formal and informal businesses may face. Respondents were asked to rank the level of agreement with the items by using a 5-point Likert scale. Hindrances in business environment had moderate reliability (Cronbach's $\alpha = 0.65$).

4.2.3. Control variables

The control variables were education level, business experience, business training, and financial capital. In general, higher levels of education of entrepreneurs positively influence their business performance (Davidsson & Honig, 2003; Van der Sluis et al., 2005). According to Becker (2009), education – a form of human capital – contributes to improve people's knowledge and skills, leading to higher levels of productivity. In order to measure the level of education, the highest level of education of entrepreneurs was used. Business experience represents a major element of human capital for entrepreneurs. Many studies showed a relationship between entrepreneurs' business experience and their business performance (Lee et al., 2001; Stam & Elfring, 2008; Van der Sluis et al., 2005). In order to measure the business experience, the number of years since entrepreneurs have started their business was used. In literature, business training was reported to be significantly important for improving the business performance of entrepreneurs (Khalid et al., 2019; Peng, 2001). In order to measure the business training, the average amount of hours of business training that entrepreneurs received annually was used. Existing studies demonstrated that there is a significant relationship between financial capital and business performance (Beck & Demirguc-Kunt, 2006; Dollinger, 2005). The current investment in inventory and facilities of the entrepreneurs was used, in order to measure the financial capital.

4.3. Analyses

The principal component analysis (PCA) was used to calculate the business performance index of young women in agribusiness. The PCA was used to give a weight to each dimension of the performance (financial, economic, and operational performance) in the calculation of the index (Nardo & Saisana, 2008). The first principal component was used to assign weights and calculate an overall business performance index (Gbetibouo et al., 2010; Labonne et al., 2007; McKenzie, 2005; Sumarto et al., 2007). The following formula was applied:

$$Pj = \sum_{i=1}^{K} [bi(aji - xi)]/sii = 1 \ldots K; j = 1 \ldots N \quad (1)$$

where P is the business performance index, b is the weights from PCA 1, a is the dimension value, x is the value of the average score of dimension items, s is the standard deviation of the average score of dimension items, i is the dimension, and j is the specific entrepreneur.

To evaluate the effects of business environment on social networks and the performance of agribusinesses owned by young women, the first preparatory step consisted of (i) the descriptive and correlation analysis of the variables and (ii) the Correlation Matrix Procedure to examine the common method variance (CMV) (Bagozzi et al., 1991; Lindell & Whitney, 2001; Matchaba-Hove & Goliath, 2016). In the second step, hierarchical multiple regression analysis (Ordinary Least Squares) was performed to test the suggested hypotheses. Hierarchical regression allows to separate the intra-group effect from the inter-group effect (Huta, 2014). Four sequential regressions with business performance as a dependent variable were tested. The control variables were entered as independent variables in Model 1. Model 2 included the control variables and the first block of independent variables (networks structure). The second block of the independent variables (network types) was added to Model 3. Finally, Model 4 included two-way interactions of network structure, network types, and hindrances in the business environment. Normality (Kolmogorov–Smirnov test) and multicollinearity (condition index and VIF: Variance Inflation Factor) were checked. SPSS 25 was used for the analysis.

5. Results

5.1. Descriptive statistics

The business performance index of young women agribusiness owners ranged between −5.19 and 2.90 and averaged about 0 (Table 1). The majority entrepreneurs (58.10%) had a medium business performance index (business performance index between 0 and 2). About one-quarter of them (23.80%) had a business performance index between −2 and 0, and 3.30% of them had a business performance index above 2. The entrepreneurs of this latter group can be considered very successful entrepreneurs. The average network size was quite large (18.67) (Table 1). The network size consisted mainly of more ties with customers (8.19 on average), raw material suppliers (3.44 on average), and family (2.91 on average). The average scores of network density, network centrality, competitive network, and supportive network were low, respectively, about 28 (out of 50), 18 (out

Table 1. Descriptive statistics of variables ($N = 365$).

Variables	Value
Business performance	
Average	−0.0025
Std. deviation	1.60
Minimum	−5.19
Maximum	2.90
Network size	
Average	18.97
Std. deviation	21.83
Minimum	0
Maximum	218
Network density	
Average	27.52
Std. deviation	9.35
Network centrality	
Average	17.61
Std. deviation	5.48
Competitive network	
Average	9.78
Std. deviation	4.24
Supportive network	
Average	7.77
Std. deviation	4.13
Barriers in business environment	
Average	3.79
Std. deviation	1.77

of 30), 10 (out of 25), and 8 (out of 20). Regarding the variable barriers in the business environment, the average score was about four (out of 10) (Table 1).

5.2. Correlations analysis of variables and common method variance (CMV)

There were substantial correlations between the variables (Table 2). Business experience had the lowest relationship with business performance ($r = 0.03$), followed by business training ($r = 0.04$). The variable network centrality had a strong relationship with business performance (r values above 0.70). The variables' network size, network density, competitive network, supportive network, and barriers in business environment had

Table 2. correlation among variables ($N = 365$).

Variables	1	2	3	4	5	6	7	8	9	10	11
1.Business performance	1.00										
2.Education level	0.21**	1.00									
3.Business experience	0.03	−0.18**	1.00								
4.Business training	0.04	0.10	0.06	1.00							
5.Financial capital	0.11*	0.31**	0.21**	0.17**	1.00						
6.Network size	0.25**	0.23**	0.17**	0.05	0.12*	1.00					
7.Network density	0.54**	0.06	0.08	0.13*	0.01	0.14**	1.00				
8.Network centrality	0.71**	0.07	0.08	0.08	0.06	0.22**	0.66**	1.00			
9.Competitive network	0.44**	0.12*	0.25**	0.12*	0.18**	0.14**	0.42**	0.48**	1.00		
10.Supportive network	0.45**	0.01	0.13*	0.03	−0.05	0.20**	0.58**	0.47**	0.46**	1.00	
11.Barriers in business environment	0.35**	0.11*	0.08	0.04	0.10	0.19**	0.49**	0.32**	0.34**	0.64**	1.00

*Correlation is significant at the 5% level.
**Correlation is significant at the 1% level.

a fair relationship with business performance. As regards the test between each variable except business performance, the highest correlation was 0.66 between network centrality and network density. All variables were used for further tests.

The Common Method Variance (CMV) is not an issue in this study. CMV will be evident when a substantially larger correlation is found among principal constructs (r values above 0.9) (Bagozzi et al., 1991). The correlation among all the constructs was found to be less than 0.9 (Table 2).

5.3. Regression analyses

Table 3 presents the results of regression analyses. For Models 2, 3, and 4, the ZRE statistic indicated that the standardized residuals are approximately normally distributed. The results of tolerance and Variance Inflation Factor (VIF) showed no statistically significant multicollinearity among the independent variables in the Models. In fact, no variable was observed to have a VIF value above 10, and no tolerance statistic was below 0.100. Furthermore, the condition indexes were within limits (30), which confirms no apparent multicollinearity.

Model 1 explained the relations between control variables and the performance of agribusinesses owned by young women. The coefficient between education level and business performance was positive and statistically significant at p-value 0.01 ($\beta = 0.21$; t value = 3.72). Business experience, business training, and financial capital were not statistically significant. In Model 2, the network structure was added, and the network size had a positive significant relationship with business performance at p-value 0.1 ($\beta = 0.07$; t value = 1.87). Therefore, hypothesis 1A is supported. Network density was not statistically significant, which does not support hypothesis 1B. The coefficient linking the network centrality with business performance was positive and statistically significant at p-value 0.01 ($\beta = 0.69$; t value = 12.07). The results support the hypothesis 1C. Education level confirmed a statistically significant positive relationship with business performance ($\beta = 0.13$; t value = 3.30).

The network types were entered into Model 3. The competitive network had a positively significant relationship with the performance of agribusinesses owned by young women ($\beta = 0.08$; t value = 1.88). This does not confirm the hypothesis 2A. In terms of supportive network, the coefficient linking the construct with business performance was positive and statistically significant at p-value 0.01 ($\beta = 0.16$; t value = 3.37), which supports the hypothesis 2B.

In Model 4, the joint effect of network size and business environment was significant on business performance ($\beta = -0.11$; t value = −3.11). The business environment negatively moderates the relationship between network size and performance of agribusinesses owned by young women. Similarly, the joint effect of network centrality and business environment was significant on business performance ($\beta = -0.14$; t value = −3.34). Thus, the business environment negatively moderates the relationship between network centrality and the performance of these entrepreneurs. Based on this, the hypothesis 3A is supported. Finally, the joint effect of network types and the business environment was not significant on business performance, resulting in the non-confirmation of the hypothesis 3B.

Table 3. Results of regression analyses with performance as dependent variable ($N = 365$).

	Model 1		Model 2		Model 3		Model 4	
Variables	Coefficient (β)	*t* Value	Coefficient (β)	*t* value	Coefficient (β)	*t* value	Coefficient (β)	*t* value
Control variables								
Education level	0.21***	3.72	0.13***	3.30	0.13***	3.19	0.12***	3.03
Business experience	0.06	1.05	−0.02	−0.53	−0.05	−1.28	−0.04	−1.13
Business training	0.01	0.23	−0.04	−0.98	−0.03	−0.90	−0.03	−0.96
Financial capital	0.03	0.50	0.03	0.68	0.03	0.83	0.04	0.90
Independent variables								
Network structure								
Network size			0.07*	1.87	0.06	1.45	0.10**	2.53
Network density			0.01	0.10	−0.09	−1.52	−0.08	−1.41
Network centrality			0.69***	12.07	0.66***	11.37	0.54***	9.08
Network types								
Competitive network					0.08*	1.88	0.09**	1.99
Supportive network					0.16***	3.37	0.15***	3.15
Two-way interactions								
Network size X Barriers in business environment							−0.11***	−3.11
Network centrality X Barriers in business environment							−0.14***	−3.34
Competitive network X Barriers in business environment							−0.02	−0.46
Supportive network X Barriers in business environment							−0.04	−0.90
Adjusted R^2	0.04		0.53		0.56		0.60	
Δ in adjusted R^2			0.49		0.03		0.04	
F value	4.59***		59.98***		51.35***		41.84***	
ZRE statistic for Kolmogorov–Smirnov test for normality	0.13		0.03		0.03		0.04	
Maximum VIF for multicollinearity	1.22		2.52		2.97		2.99	
Minimum tolerance statistic	0.97		0.95		0.94		0.92	
Condition index for multicollinearity	6.55		15.55		18.81		20.20	

*Significant at the 10% level.
**Significant at the 5% level.
***Significant at the 1% level.

6. Discussion

The findings of regression analyses showed that network size, network centrality, competitive network, and supportive network positively affect the performance of agribusinesses owned by young women. This supplies empirical evidence that the increased number of relationships in entrepreneurs' network structure results in increased access to information and resources, thereby impacting business performance positively (Burt, 2000; Prajapati & Biswas, 2011). The findings could be explained by the fact that the ties that young women agribusiness owners formed with family, friends, government institutions, financial institutions, input suppliers, customers, competitors, and other support institutions help them for accessing information and resources.

A high level of centrality improves the level of the performance of agribusinesses owned by young women. This finding supports previous empirical evidences (Das & Goswami, 2019; Ho & Pollack, 2014; Prajapati & Biswas, 2011). As for network size, a higher level of centrality improves the quickness of access to useful information and resources, thereby impacting business performance positively. Despite the positive relationship between network density and business performance suggested in the literature (Das & Goswami, 2019; Ren et al., 2009; Saha & Banerjee, 2015), the findings showed no significant relationship in the context of young women agribusiness owners. This might be due to the specific context in which the study was conducted or the relationship would be rather indirect.

The study found a positively significant relationship between competitive network and performance of agribusinesses owned by young women. The higher the level of competition among these entrepreneurs, the higher their business performance. This happened maybe because competition among young women agribusiness owners stimulates innovation and improves the production process designed to improve product quality, thereby increasing sales growth and substantially increasing profitability. In single-sex competitive environments, women are able to perform better than when they have to compete against men (Gneezy, Niederle, & Rustichini, 2003). Moreover, the study found a positively significant relationship between supportive network and performance of agribusinesses owned by young women. This result corroborates earlier studies on entrepreneur's supportive network impact. Belderbos et al. (2004) report that research institutions cooperation is essential to create and bring new products to market, improving business performance. Similarly, Chagwiza et al. (2016) show that dairy cooperative membership has a significant positive influence on the commercial success of its members in Ethiopia.

The study also found that the relationship between network size and performance of agribusinesses owned by young women is negatively moderated by the business environment. Similarly, the relationship between network centrality and business performance of these entrepreneurs is negatively moderated by the business environment. Increasing barriers in the business environment appear to attenuate the positive influence of both network size and network centrality upon the performance of agribusinesses owned by young women. These network structures are more beneficial when the business environment is favorable.

The current study provides many implications for young women agribusiness owners, practitioners, and policymakers. By assessing the influence of social networks on the

performance of agribusinesses owned by young women, this research helps entrepreneurs and policymakers to take the necessary measures to address the underperformance of agribusinesses owned by young women. The structure and types of networks that generate economic benefits for these entrepreneurs were identified. This study suggests that network size, network centrality, competitive network, and supportive network play a critical role in improving the performance of agribusinesses owned by young women. The findings of the study provide useful guidelines for entrepreneurs on which social ties to develop. Young women agribusiness owners must develop relationships with family members, friends, raw material suppliers, customers, and other partners to discuss business issues frequently. However, they should ensure that only reliable partners are included in the network, because a larger network size does not necessarily guarantee that quality information, and resources will be acquired. Frequent interactions within the network to which they belong are welcomed – they should be in a central position in the network. Various organizations and NGOs supporting agribusiness in developing countries such as Benin must raise awareness about the influence of network size and network centrality on the performance of agribusinesses owned by young women.

The present study also highlights the importance of the business context in which young women agribusiness owners exploit their social ties. In favorable business environment when hindrances are low, network size and network centrality are strongly associated with high levels of business performance. This study once more illustrated the crucial role of the business environment for entrepreneurs in developing countries (Acs et al., 2011; Amine & Staub, 2009). It highlights the specific conditions for the effectiveness of network structure, mainly network size and network centrality on the performance of agribusinesses owned by young women in developing contexts such as Benin. Attention needs to be given by policymakers to stimulate assistance to these entrepreneurs, for example, by simplifying and making more flexible the rules and regulations in terms of taxation. Development of policies and programs in terms of electricity and information technology that promote the business environment for these entrepreneurs could also be a critical strategy.

Based on the positive impact of competitive network in the performance of agribusinesses owned by young women, while policies and programs give greater emphasis to the development of cooperation between entrepreneurs, further studies could examine how these entrepreneurs can gain a competitive advantage within competitive networks. These could help better understand relevant actions that policymakers should take to support women agribusiness owners. Finally, strategies increasing the contribution of various institutions to the business performance of these entrepreneurs should be put in place, as the study highlighted the importance of supportive networks. Links with government institutions, NGOs, financial institutions, research institutions, training institutions, etc., should be developed and maintained among these entrepreneurs.

The fact that the two-way interactions of network types and business environment on business performance were not significant indicates that network types and business environment may have independent effects on business performance. This suggests that agribusinesses owned by young women may be able to attain comparable levels of performance regardless of the network type to which they belong or the business environment in which they operate. The implications of these results for

business environment policies may be that policies designed to promote the development of network types may not have a significant impact on the performance of agribusinesses owned by young women. Instead, policies that focus on promoting cooperation among agribusinesses owned by young women, or that encourage the development of networks with specific characteristics in terms of size and network centrality, may be more effective in improving business performance. Further research is needed to better appreciate factors that may contribute to the effectiveness of network types for improving business performance, in order to find the most effective strategies for fostering the performance of agribusinesses owned by young women in different environments.

7. Conclusion and suggestions for further research

This study examined how social networks influence the performance of agribusinesses owned by young women, as well as the moderating effects of business environments on these relationships. It contributes to research efforts aimed at understanding the effectiveness of social networks on business performance in developing countries.

Regression analyses revealed that network size, network centrality, competitive network, and supportive network are key elements for the performance of agribusinesses owned by young women. These factors influence their business performance positively. The effect of network density was not significant on their performance. These entrepreneurs must develop relationships with family members, friends, input suppliers, customers, and other partners to discuss business issues frequently. They should be in a central position in their social network. Organizations and NGOs supporting agribusiness in developing contexts such as Benin must raise awareness about the influence of these network structures on the performance of agribusinesses owned by young women. Strategies to increase the contribution of government institutions, NGOs, financial institutions, research institutions, training institutions, etc., to business performance of these entrepreneurs should be instituted. Ties with these institutions should be developed and maintained among these entrepreneurs. The study also found that the business environment negatively moderates the relationship between network size and business performance, network centrality, and business performance. Therefore, the effectiveness of these network structures was dependent on favorable business environments for young women agribusiness owners. The two-way interactions of network types and business environment on business performance were not significant.

The study presents some limitations. Given that it was based on cross-sectional data, the findings should be verified by further research based on longitudinal data. The study focused on the network size in general. An in-depth analysis of network size may provide additional information. Further research should explore the influence of small, medium, and large networks on business performance. Moreover, further research could examine how these entrepreneurs can gain a competitive advantage within competitive networks. Finally, further research is needed to better understand factors that may contribute to the effectiveness of network types for improving business performance.

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