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Women-led SMEs: Innovation and collaboration → performance?

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Women-led SMEs: Innovation and collaboration → performance?

It has been widely accepted that innovation and collaboration have a positive effect on business performance. It has also been proposed that gender diversity on boards of directors improves companies' innovative performance and, consequently, their performance. However, research on innovation has not discovered what happens with the innovation-performance relationship in SMEs led by women. Using a sample of 503 SMEs led by women, it is shown that innovation is not a determinant of businesswomen's business performance. This study provides insights into how SMEs led by women who decide to innovate or collaborate cannot appropriate the literature's benefits.

Keywords: Women CEO, SME, innovation, collaborative innovation, firm performance, emerging economies

Introduction

The hypothesis of a positive relationship between innovation and business performance has been widely accepted in academic research (J.-S. Chen et al., 2009; Gronum et al., 2012; Hernandez-Espallardo et al., 2018; Lee et al., 2019; Ramadani et al., 2019). Innovation and collaborative innovation have been shown to contribute to business development and economic growth (Christensen, 1998). Several studies highlight that gender diversity on the board of directors positively affects innovation performance and, consequently, higher company performance (Chen et al., 2018; Ruiz-Jiménez & Fuentes-Fuentes, 2016). This study questions whether innovation is really important for women-led SMEs. It has also been found in the literature and statistics that businesswomen engage in low levels of innovation and collaboration (GHK, 2008; Verzhinina et al., 2019). Little research has been found regarding women-led SMEs' innovative and collaborative behavior (Belghiti-Mahut et al., 2016). This gap invites exploration beyond the simple difference in performance between male and female entrepreneurs due to innovation and collaboration.

The Average Treatment Effect (ATE) estimator is calculated by propensity score matching (PSM) to determine if, of all the SMEs led by women, those that have innovated or collaborated have better performance than those that have not. This research shows no significant relationship between innovation and company performance, nor is the effect of collaborative innovation significant. It is interesting to observe how SMEs led by women decide to get involved in innovation activities, or collaborations do not manage to appropriate the improvements in business performance that have been widely reported in the literature.

This document continues with the theoretical framework and the development of hypotheses. In section 3, the methodology and results are presented. The conclusions and discussion are included in section 4. Section 5 contains the implications of the study.

Theoretical framework

Innovation has been of particular interest to academic research, as it allows for business growth and generates competitive advantages (Christensen, 1998). Recently, a topic that has attracted attention in this field is collaborative innovation and how those involved can establish mutually beneficial relationships (Diamond & Vangen, 2017; Yström & Agogué, 2020). Through collaborative innovation, companies can access resources such as capital, information, knowledge, and technology through a cooperation agreement with external actors that involve specific actions to contribute to each party (Feranita, Kotlar, & De Massis, 2017).

Collaboration with different external actors (e.g., suppliers, competitors, universities, customers) improves knowledge transfer, including market knowledge, and promotes innovation capacity (Clauss & Kesting, 2017). Najafi-Tavani et al., 2018 found that collaborative innovation is effective when company managers have developed the capacity to scan and acquire external knowledge. In this sense, to benefit from collaborative innovation, SMEs must have absorption capacity. However, they are at a disadvantage compared to larger companies because their personnel show a lower educational level and are less willing to collaborate (Kurdve et al., 2020). In the particular case of SMEs run by women, Ruiz-Jiménez & Fuentes-Fuentes (2016) conclude that women in management positions positively moderate the relationship between management skills and innovation.

One of the critical aspects of developing collaborative innovation is the amplitude of the entrepreneurs' social networks; these networks allow to find external collaborators

of different nature that enrich collaborative innovation activities (Xue et al., 2018). Lindberg et al. (2014) found that women entrepreneurs have smaller and more local social networks than male entrepreneurs, so they are less likely to access collaborative innovation relationships. Very little research has been done on businesswomen's collaborative innovation behaviors (Belghiti-Mahut et al., 2016). This literature gap motivates us to explore whether SMEs led by women involved in collaborative innovation benefit from innovation and cooperative relationships. In this regard, the following hypotheses are put forward,

H1. *SMEs run by women who perform innovation activities have better financial performance than companies led by women who do not innovate.*

H2. *SMEs run by women involved in collaborative innovation relationships have better financial performance than companies led by women who do not cooperate with others in innovation.*

Methodology and Results

This research data was extracted from the Fifth Longitudinal Survey of Companies 2017 (ELE5) of Chile (INE, 2017). This database is the largest official source of information regarding the Chilean business ecosystem and considers its business diversity representative. It considers a sample of 503 small and medium enterprises managed by women and has between 5 and 25 years of operation. The propensity score matching (PSM) method is used to obtain the Average Treatment Effect (ATE) estimator. We identified two analysis models, first establishing whether companies that carry out innovation activities have better performance than their non-innovating counterparts.

Second, we evaluate whether SMEs involved in collaborative innovation perform better than SMEs involved in this type of relationship.

The dependent variable is a measure of business performance represented by the return on assets (ROE). The selection (or treatment) variables are: In the first model, a dichotomous variable that takes the value one for companies that perform and zero otherwise; in the second model, it is a binary variable that takes the value one if the company is involved in collaborative innovation and zero otherwise. The control variables for both models will be the company's age, size, and capital intensity. Table 1 shows the detail of the variables, the units of measurement, and the descriptive statistics.

Table 1. Descriptive statistics

Variable	Description and measure	Mean	S.D.
Return on assets (ROA)	The ratio of net income to total assets	0.140	0.273
Innovation	1 = The company has innovation activities 0 = otherwise	0.163	0.370
Collaboration	1 = The company has innovative collaborations 0 = otherwise	0.072	0.258
Age	Company's age in years	14.374	6.302
Age Square	Control to account for non-linear effects	246.247	194.488
Capital Intensity	The ratio of total assets to the number of workers	37,937.8	313,385.4
Size	Natural logarithm of the company's fixed assets	12.867	1.828

The results are presented in Table 2. The first model's findings indicate that innovation activities in SMEs led by women do not represent a significant improvement in the company's financial performance ($M=0.023$; $p>0.10$) concerning companies led by women who do not innovate. In the second model, the results are not significant

($M=0.008$; $p>0.10$). Therefore, women-led SMEs' participation in collaborative innovation does not affect other women-led SMEs' performance. Therefore, the results obtained do not support the hypotheses raised.

Table 2. Average Treatment Effect (ATE)

ROA	Coef.	S.D.	z	P > z	95% Conf. Interval		Obs
ATE Innovation (1 vs 0)	0.023	0.036	0.65	0.516	-0.047	0.093	503
ATE Innovative Collaboration (1 vs 0)	0.008	0.051	0.15	0.881	-0.093	0.108	503

Discussion and conclusion

Statistics show that women's SMEs show low participation in innovation and collaborative innovation relations with third parties (INE, 2017). Other studies have reported similar findings in different contexts (GHK, 2008; Vershinina et al., 2019). Although it has been shown that innovation and collaborative innovation have significant positive effects on business performance (Hernandez-Espallardo et al., 2018), this study shows that SMEs run by women and that innovate have not benefited from improvements in business performance. This research has not compared female leadership with male leadership, as is generally done. The purpose is to analyze SMEs' competitiveness through the impact of their innovation decisions on company performance. This work questions a series of investigations that claim that innovation and collaboration improve company performance (J.-S. Chen et al., 2009; Gronum et al., 2012; Hernandez-Espallardo et al., 2018; Lee et al., 2019; Ramadani et al., 2019). Some explanations for this counterintuitive result are proposed.

When the focus is on a specific portion of the business ecosystem, such as women-led SMEs, the effects of innovation and collaboration on these well-defined groups are

more accurately captured. It opens the discussion of how generalizable results support the hypothesis about the positive relationship between innovation and business performance. It has been recognized that the field of innovation and collaboration is predominantly male (Belghiti-Mahut et al., 2016). Therefore, gender gaps in access to opportunities and resources for innovation and collaboration are good arguments to explain why women-led SMEs are little involved in these processes. In general, SMEs have fewer capabilities and resources for innovation and collaboration (Kurdve et al., 2020). Suppose we add to this the limited social networks of businesswomen (Song & Berger, 2019). In that case, the concentration of SMEs under women's leadership in low innovation industries (Nissan et al., 2012), and the risk preferences of female managers (Huysentruyt, 2014) result from this study up well. Chen et al. (2018), in a study of gender diversity on the board of directors, found that female directors positively influenced the company's innovative and financial performance. This study argues that when women are the highest decision-making unit in an SME, innovation's positive performance is not sustained, considering a uniquely female business environment.

Implications

It is interesting to observe how SMEs run by women and decide to get involved in innovation activities or collaborations do not manage to appropriate the improvements in business performance that have been widely reported in the literature. It is a warning sign since lower performance in innovative SMEs can generate a setback in innovation coverage in specific business sectors. Since women-led SMEs are concentrated in low-innovation industries, it is essential to direct entrepreneurship support programs to the insertion of women entrepreneurs in innovation-intensive economic sectors. The SMEs considered in this study have two characteristics that have been defined as lagging in innovation: they are smaller and run by women. It means that public policies that promote

innovation at the business level must improve the performance of innovation by considering these two characteristics simultaneously. Before inviting entrepreneurial innovation, institutions must ensure that the entrepreneurial ecosystem is sufficiently developed to ensure growth opportunities for all.

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