

Women's exporting success:

evidence from Canadian small
and medium-sized enterprises

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Abstract

Based on the Statistics Canada 2017 Survey on Financing and Growth of Small and Medium Enterprises, this chapter examines the role of gender on the export participation of Canadian small and medium-sized enterprises (SMEs), and identifies specific characteristics and business activities of women-owned SMEs that are associated with their export propensity and export intensity. It also provides empirical evidence of the benefits of online payments and innovations to the internationalization of women-owned SMEs. The study finds no statistically significant gender differences in the export propensity and the export intensity when business characteristics are controlled for. However, the impact of some characteristics on export propensity are significantly different between men and women-owned SMEs. Firstly, larger SMEs owned by women are less likely to export than men-owned and equally owned SMEs of the same size. Secondly, online payment and innovations play a more crucial role in facilitating exports for women-owned SMEs. Finally, for higher export intensity, the owner's education level and managerial experience are much more important for women-owned SME exporters than for men-owned and equally owned exporters.

Introduction

This study examines the role of gender of ownership on export participation of Canadian small and medium-sized enterprises (SMEs) and other firm-specific characteristics and business activities of women-owned SMEs.¹ Using firm-level data, we test whether women's ownership matters for SMEs' export propensity and intensity.² Additionally, we investigate if the relationship between firms' characteristics and export outcomes differs with the gender of ownership.

Understanding the drivers of increased women's participation in exports is important to inform policies aimed at ensuring the benefits of international trade reach all groups. An inclusive approach to trade recognizes that trade policies and agreements are not gender neutral. The recent availability of detailed data on owner and business characteristics suggests that not all groups (e.g. women, immigrants and visible minorities) are proportionally represented among exporters, or entrepreneurs in general (Huang, 2020; World Bank and WTO, 2020).

In Canada, while women-owned SMEs are underrepresented among exporters, this appears to reflect a gender gap in entrepreneurship. In 2017, women-owned SMEs represented 15.6 per cent of all SMEs, while 63.5 per cent were majority owned by men, and the remaining 20.9 per cent were equally owned by men and women (Bélanger-Baur, 2019).

A similar gender distribution is observed among SME exporters: 14.8 per cent were owned by women, 66.3 per cent by men and 18.9 per cent were equally owned (Bélanger-Baur, 2019). Women entrepreneur under-representation was also identified in US firms (Coleman and Robb, 2012; Fairlie and Robb, 2009), and in other years in Canada (Grekou and Liu, 2018; Industry Canada, 2015; Rosa and Sylla, 2016). Moreover, gender differences in firm performance are also identified: women-owned enterprises fall behind men-owned in terms of survival rates, sales, labour productivity and other indicators (Coleman and Robb, 2012; Couture and Houle, 2020; Fairlie and Robb, 2009; Grekou and Liu, 2018; Grekou and Watt, 2021).

These gender differences in entrepreneurship and firm performance do not seem to translate into lower export participation of women-owned SMEs in Canada, which is a somewhat surprising observation. Export propensity does not reveal large differences between gender ownership groups. In 2017, 11.1 per cent of women-owned SMEs exported, compared to 12.2 per cent for men-owned and 10.5 per cent for equally owned SMEs, indicating that firms owned by women are almost as likely to export as those owned by men. Moreover, export intensity (the export-to-sales ratio) among women-owned SMEs was 3.4 per cent, compared to 4.4 per cent for men-owned and 3.9 per cent for equally owned SMEs (Bélanger-Baur, 2019).

Looking more closely at some characteristics of SME exporters in Canada, Sekkel (2020) shows that, women-owned firms are over-represented among smaller SMEs, with 63 per cent having fewer than 20 employees and are also concentrated in sectors less likely to export, such as retail trade (32 per cent of women-owned exporters versus 6 per cent for men-owned and equally owned), and other services (8 per cent of women-owned exporters versus 2 per cent for men-owned and equally owned). In retail trade, 46 per cent of exporters are women-owned SMEs and, in other services, 41 per cent. Those shares are well above the group average of 14.8 per cent. Because smaller-sized businesses and those concentrated in services are normally much less likely to export, it raises the question of what business behaviours and decisions allow women-owned firms to become exporters at similar rates to men.

The trade literature on heterogeneous firms (Melitz, 2003) indicates that export costs (tariffs, quotas, transportation, product requirements) raise barriers that only the most productive firms can overcome. With limited resources, SMEs are generally less productive and therefore less likely to export. However, there are exceptions. Using Canadian firm-level data, Leung *et al.* (2008) show that, while on average, smaller firms are less productive many small firms are more productive than larger ones in the same industry group, highlighting not only diversity among firms but the fact that size is not the only factor influencing productivity differences. The same diversity in the size-productivity relationship is found in the size-export link. Lileeva and Trefler (2010) found many small and less productive exporting firms in Canada, which they called the “paradox of unproductive exporters”.

According to the World Bank and WTO (2020), the extent to which international trade can benefit women owners depends on their business characteristics, such as sector, size and access to information technology, as well as discrimination (explicit or implicit), and their home country's participation in trade.³

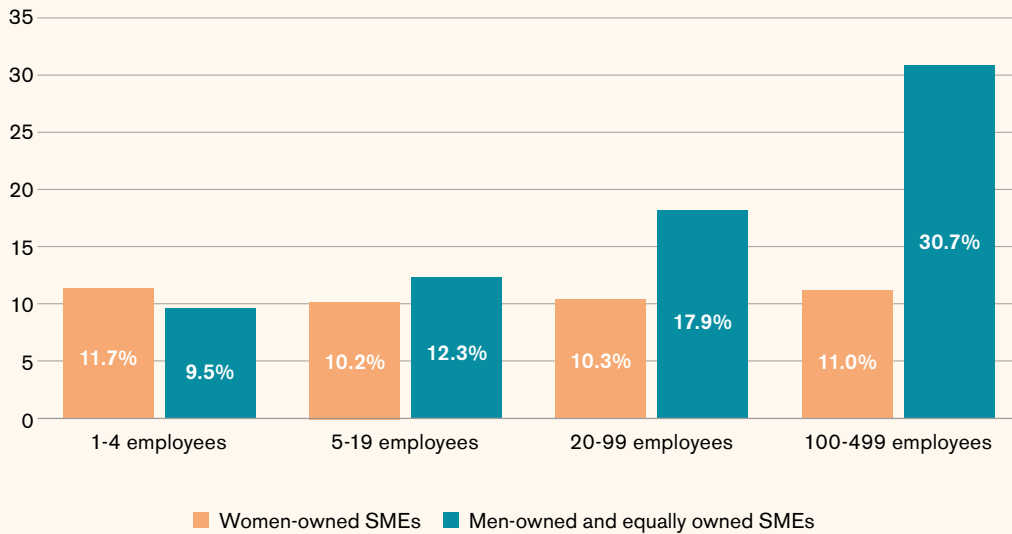
“ Women are over-represented in sectors with lower value-added and less export intensity, and among smaller enterprises.

Using the theoretical approach based on feminist frameworks suggested by Orser *et al.* (2010), the liberal feminist view suggests that while men and women are essentially just as rational and make similar business decisions, they face different social and structural barriers. If women-owned firms underperform relative to men-owned ones, it could be attributed to systemic differences in firms' and owners' observed characteristics. Consequently, when these characteristics are controlled for, there should be no difference in firms' export performance. Alternatively, the social feminist approach suggests that women and men go through different socialization processes so that women construct gendered behaviours that lead to different decisions and business behaviours than men (Robichaud *et al.*, 2015). As such, gender would interact with firms' and owners' resource characteristics and yield gender differences in export performance (Orser *et al.*, 2010).

The empirical literature provides evidence for both theories. Marques (2015) compiled data from the World Bank's Enterprise Survey for twenty-three developing countries for 2006-07 and 2009-10 and found no statistically significant gender effect on export outcomes. However, the relationship between sector and export outcome depends on gender of ownership/management. The author states that “it is not being a woman per se that impacts export decisions, but the ownership and sector characteristics of firms managed or owned by women that bear a disadvantage for exporting”. Women are over-represented in sectors with lower value-added and less export intensity, and among smaller enterprises. Patents, a strong determinant of export propensity for both genders, have a positive effect on export intensity of women-owned and women-managed firms. Using a sample of Canadian SMEs in 2004, Orser *et al.* (2010) find no statistically significant effect of the gender variable on the probability of exporting, after controlling for firm and owner characteristics. Alternatively, size, growth intentions and R&D investments significantly increased SMEs' export propensity. Owner experience showed no significant effect, while a firm's age was negatively related to exports. The authors used gender interaction variables to see whether the relationship between firm characteristics and export propensity was different between gender of ownership groups. They find that immigrant women were more likely to export than immigrant men, and that for the same firm size (number of employees), women-owned SMEs were less likely to export than men-owned ones.

This study builds on this literature by providing updated estimates of the role of ownership gender in export propensity and intensity for Canada, and identifying business behaviours and characteristics associated with female entrepreneurs' exporting success. Using data from the 2017 Survey on Financing and Growth of Small and Medium Enterprises (SFG), covering over 9,000 firms that represent Canada's SME population, this study estimates probit regression models for export propensity and two-part regression models for export intensity. As with previous studies for Canada and developing countries, we find no individual gender effect for the two exporting indicators, namely export propensity and export intensity, after controlling for SME characteristics such as size, industry and age, as well as management attributes and behaviour, such as education, management experience, innovation and presence of an online payment feature on the firm's website. Similar to Orser *et al.* (2010), gender interaction

Figure 1: Export propensity by SME size and gender of ownership in Canada, 2017 (in percent)



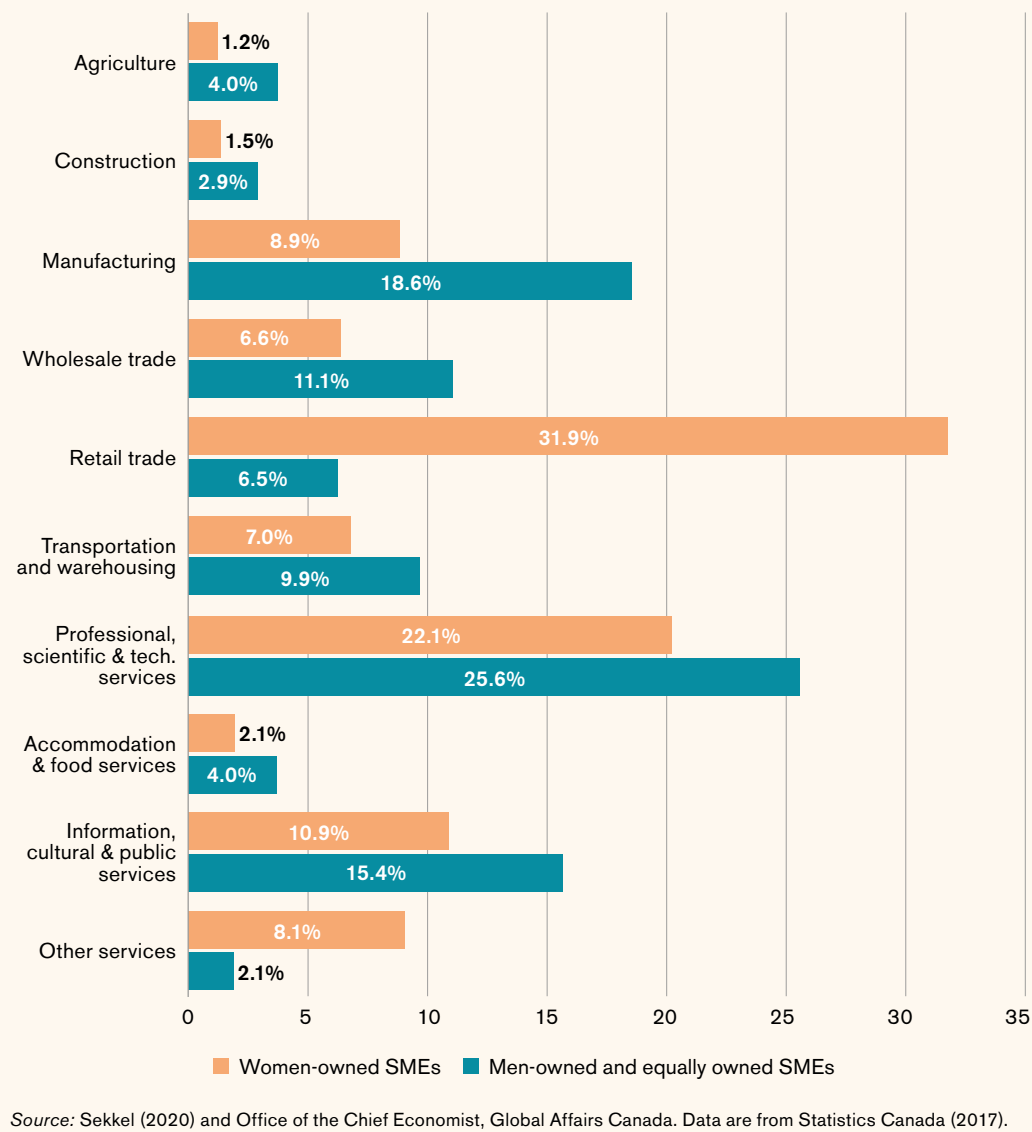
Source: Office of the Chief Economist, Global Affairs Canada. Data are from Statistics Canada (2017).

variables showed that women-owned SMEs with more than 19 employees were less likely to export than men-owned or equally owned ones. Descriptive data confirm these results. In Figure 1, the export propensity of men-owned and equally owned SMEs increases with each increment in size category, but the probability of exporting is practically the same among all size categories for women-owned firms.

Differently than any previous study, authors find that women-owned SMEs that have access to online payment, and use innovations in selling goods and services and in organizational method, are significantly more likely to become exporters than men-owned or equally owned SMEs. The fact that women-owned SMEs are highly concentrated in retail trade relative to men-owned and equally owned SMEs (see Figure 2), and that retail trade has the second highest percentage of SMEs with an online payment feature (8.2 per cent, after accommodation and food services at 8.6 per cent), suggests that providing an online payment feature enables them to overcome some of the barriers to entering export markets (Statistics Canada, 2017).⁴ Such business behaviours seem to compensate the relatively disadvantageous business characteristics of women-owned firms and allowed them to succeed internationally.

A number of studies focus on the role of the Internet (Bianchi *et al.*, 2017; Ganotakis and Love, 2012; Nambisan, 2017; Reuber and Fisher, 2011;), digital technologies and e-commerce in the internationalization of SMEs in general, discussing the enabling effects of digital technologies in reducing transaction costs and lowering entry barriers to international markets. However, while various studies and reports highlight the increased importance of digital technologies for female entrepreneurs in cross-border trade (APEC/USAID, 2020; Rosenbaum and Hannibal, 2017; Suominen, 2018), none looked at the role of these factors for women-owned businesses using a representative sample of firm-level data.

Figure 2: Industry distribution of SME exporters by gender of ownership in Canada (2017) (in percent)



For export intensity, these factors were not statistically significant for any gender group. Alternatively, women-owned SMEs whose managers have more years of education and more years of management experience exported a higher share of their sales.

Data and general characteristics of Canadian SMEs

This study relies mainly on firm-level data from Canada's 2017 SFG. The SFG is conducted every three years by Statistics Canada and provides a cross-section sample of SMEs having between 1 and 499 employees and at least Can\$ 30,000 in annual revenues. The 2017 sample had 9,115 responding firms linked with the National Accounts Longitudinal Microdata file for 2017 and 2016.⁵ SMEs' gender of ownership is determined by the percentage owned



by women, classified in three categories: (1) men-owned (0-49 per cent women ownership); (2) equally owned by men and women (50 per cent women ownership); and (3) women-owned (51-100 per cent women ownership).

Here, men-owned and equally owned SMEs were combined in one category as there was no statistical difference between the two groups based on various empirical tests (mean comparison after regressions). Also, it is reasonable to expect that if there were any gender-specific barriers limiting SMEs' export participation, these barriers could be overcome by the presence of a male co-owner in equally owned enterprises, placing these firms in a similar group with men-owned SMEs.

Some brief summary statistics from the data show that women-owned firms represented 15.6 per cent of all SMEs, and of those, 11.1 per cent exported in 2017.⁶ By comparison, the proportion of exporters among men-owned and equally owned SMEs was only slightly higher at 11.8 per cent. Additionally, despite the very small differences in the export probability and labour productivity level (revenue/employee), some characteristics are quite different between the two ownership groups. Women-owned SMEs: (i) were much smaller 60.7 per cent had 1-4 employees compared to 53.7 per cent of men-owned and equally owned SMEs; (ii) were less concentrated among firms that were older than 10 years; (iii) were more present in services sectors, especially in retail trade (18 per cent of women-owned versus 10.3 per cent of men-owned and equally owned firms) and information, health and arts services (17.9 per cent of women-owned versus 9.15 per cent); (iv) had managers with fewer years of management experience, and were less likely to use any type of innovation; (v) had primary decision-makers with more years of education – about 18 per cent had a master's degree or higher, compared to 15 per cent for men-owned and equally owned SMEs; and (vi) were more likely to engage in e-commerce, with 11.8 per cent having an online payment feature on their website, compared to 7.8 per cent for the others.

Methodology

Export propensity

The following probit regression equation was estimated to test whether the gender of ownership plays a role in SMEs' probability of exporting:

$$\mathbf{Exportpropensity}_i = \mathbf{c} + \mathbf{\alpha Women}_i + \mathbf{\beta X}_i + \mathbf{\varepsilon}_i \quad (1)$$

The dependent variable, *Exportpropensity* is a dummy variable for exporter status of firm *i*, taking the value of 1 if the firm exported in 2017; the coefficient of interest, α , is associated with the gender dummy variable identifying female-owned SMEs, *Women*. The vector *X* includes export determinant variables related to firms' and owner's/manager's characteristics such as size, industry, years of managerial experience, level of education, age of firm and labour productivity – measured as the natural logarithm of the ratio revenue–employment, which was included with a one-year lag (2016) to minimize any potential endogeneity between productivity and exporting. As discussed in the literature review, higher productivity increases the probability of exporting, but firms can also become more productive after they start exporting. So, using a lagged productivity measure at least partially minimizes that potential secondary effect.

Equation 1 is further expanded to include measures of business behaviour, measured by innovation activities and online payment. Innovation is identified by the presence of product, process, organizational and/or selling innovations, as well as the presence of an online payment feature on a firm's website.⁷ Export determinant variables and business behaviour variables then interacted with the dummy variable for female ownership to verify any differential gender effect. These interactions show whether the relationship between firms' characteristics and export propensity is different for women-owned SMEs and men-owned and equally owned SMEs.

The equation with gender interaction variables is specified as follows:

$$\text{Exportpropensity}_i = c + \alpha \text{Women}_i + \beta X_i + \mathcal{L} \text{Women}_i * X_i + \varepsilon_i \quad (2)$$

Where α and β are as in Equation 2, and \mathcal{L} is the coefficient of the product of the dummy variable for women ownership and export determinants variables. If the coefficient is statistically significant, then the difference is significant.

Export intensity

The role of female ownership in SMEs' export intensity, defined as the ratio of a firm's export sales to total sales, was analysed with a two-part model. These models are useful when the outcome variable, y_i , export intensity in this case, is never negative, such that $y_i = 0$ for firms that do not export, and $y_i \geq 0$ for firms that export. The expected total export value as a function of a set of covariates is given by $E(y | x) = P(y > 0) + E(y | y > 0)$, where the first term represents the probability of exporting, and the second term represents the value of exports given that the firm is an exporter. The two-part model allows for independence between the decision to export and how much to export. In practice, the first part of the model estimates a binary choice for the probability of exporting as a function of a set of covariates such that $P(y_i > 0 | x)$. Then, conditional on the exporting decision, the second part estimates export intensity as a function of the same set of covariates through a linear regression model, $E(y_i | y_i > 0, x_i)$ (Belotti *et al.*, 2015). This strategy corrects for the sample selection bias among exporters based on their observed differences in business performance relative to non-exporters. Additionally, the binary choice model accounts for the probability of observing a positive or zero outcome. Differently than the Heckman selection model, which denotes censored values by a zero outcome (tobit model), in the two-part model, the zeros are true values and may represent a deliberate business decision not to export, so it is not exactly censored.

For this study, once the equation is specified, the two-part model fits the probit model for the probability of exporting, and conditional on having a positive outcome for export intensity, it estimates an OLS (ordinary least squares) for export intensity, with log-transformed values for the dependent variable. Since both parts of the model use the same explanatory variables, the basic specification of the two-part model is given by Equation (3):

$$\text{Exportintensity}_i = c + \alpha \text{Women}_i + \beta X_i + \varepsilon_i \quad (3)$$

The dependent variable, **Exportintensity**, is continuous and represents the ratio between export sale and total sales for firm i in 2017. It keeps its raw values for the probit model and is log-transformed in the second part of the model, as $\ln(\text{Exportintensity})$. The independent variables have the same definitions as in Equation (1). Mirroring the export propensity analysis, the basic

specification of Equation 3 is tested with the inclusion of variables for technological innovation and online payment, and the inclusion of interaction variables between the dummy for women ownership and the other variables.

All the equations presented here were estimated using the survey weights. While there are no extreme differences between the weighted and unweighted regression results for the probit models of export propensity, the weighted regression was preferred so the results could be extended to the Canadian SME population. Given the cross-sectional structure of the data and the methodology used, the regression results presented here do not indicate causality between independent variables and export outcomes.

Determinants of women's exporting success in Canada

Export propensity: the role of e-commerce and innovation

Table 1 presents the results of the basic model and the model extension with business behaviour variables for innovation and online payment. In both sets of results, the coefficient for women ownership is not significant, indicating that, after controlling for observed characteristics of enterprises and primary decision-makers, there is no statistical evidence that women-owned SMEs have a different likelihood of exporting relative to men-owned and equally owned SMEs. These results concur with previous findings and are aligned with the liberal feminist approach, where the gender of ownership itself does not affect exporting outcomes of SMEs.

Table 1: Probit for probability of exporting: basic model and model with business behaviour

Variable	Basic model		Basic model with business behaviours	
	Probit coefficient	Ave. marginal effects	Probit coefficient	Ave. marginal effect
Women-owned	0.0302 (0.0942)	0.00478 (0.0151)	-0.0596 (0.107)	-0.0124 (0.0218)
Firm size (1-4 employees omitted)				
5-19 employees	0.147** (0.0720)	0.0223** (0.0109)	-0.0497 (0.0909)	-0.0101 (0.0185)
20-99 employees	0.330*** (0.0817)	0.0566*** (0.0152)	0.161 (0.101)	0.0367 (0.0234)
100-499 employees	0.598*** (0.122)	0.121*** (0.0306)	0.485*** (0.131)	0.129*** (0.0382)
Labour productivity	0.186*** (0.0380)	0.0289*** (0.00592)	0.168*** (0.0439)	0.0358*** (0.00917)
Innovation activities (no innovation omitted)				
Product and process			0.392*** (0.107)	0.0841*** (0.0262)
Organizational			0.586*** (0.134)	0.139*** (0.0392)
Selling			0.455*** (0.0935)	0.101*** (0.0233)
Online payment			0.500*** (0.146)	0.131*** (0.0457)

WOMEN'S EXPORTING SUCCESS

Variable	Basic model		Basic model with business behaviours	
	Probit coefficient	Ave. marginal effects	Probit coefficient	Ave. marginal effect
Education (high school omitted)				
College/CEGEP	0.0987 (0.0806)	0.0133 (0.0109)	0.0546 (0.107)	0.0102 (0.0200)
Bachelor	0.346*** (0.0905)	0.0558*** (0.0156)	0.241** (0.107)	0.0505** (0.0224)
Master or above	0.217** (0.105)	0.0319** (0.0163)	0.278** (0.127)	0.0595** (0.0281)
Years of management experience (<5 years omitted)				
5-10 years	0.253 (0.167)	0.0349* (0.0206)	0.550*** (0.184)	0.0928*** (0.0270)
10 years or more	0.223 (0.161)	0.0300 (0.0189)	0.484*** (0.171)	0.0780*** (0.0212)
Start-up	0.234* (0.125)	0.0415* (0.0251)	0.372** (0.154)	0.0934** (0.0443)
Industry (manufacturing omitted)				
Agriculture and mining	-0.963*** (0.127)	-0.240*** (0.0269)	-0.896*** (0.199)	-0.276*** (0.0475)
Construction	-1.632*** (0.140)	-0.296*** (0.0226)	-1.622*** (0.180)	-0.372*** (0.0303)
Transportation and warehousing	-0.329*** (0.103)	-0.106*** (0.0321)	-0.244* (0.133)	-0.0908* (0.0482)
Information, health and arts	-0.861*** (0.149)	-0.224*** (0.0309)	-0.936*** (0.170)	-0.284*** (0.0415)
Retail trade	-0.939*** (0.125)	-0.236*** (0.0262)	-0.996*** (0.151)	-0.296*** (0.0365)
Wholesale trade	-0.482*** (0.0958)	-0.147*** (0.0282)	-0.537*** (0.110)	-0.186*** (0.0366)
Real estate	-1.049*** (0.194)	-0.251*** (0.0311)	-0.995*** (0.249)	-0.296*** (0.0521)
Professional and scientific	-0.402*** (0.0953)	-0.126*** (0.0294)	-0.452*** (0.113)	-0.160*** (0.0391)
Administrative support	-0.986*** (0.194)	-0.243*** (0.0328)	-1.171*** (0.238)	-0.325*** (0.0432)
Accommodation and food	-1.109*** (0.114)	-0.258*** (0.0241)	-1.080*** (0.148)	-0.310*** (0.0353)
Other services	-1.070*** (0.115)	-0.253*** (0.0247)	-1.140*** (0.141)	-0.320*** (0.0335)
Constant	-3.181*** (0.460)		-3.052*** (0.575)	
Observations	7,838		4,498	
Pseudo R2	0.1505		0.1905	

Note: Robust standard errors in parentheses. Significance level of coefficients indicated as *** p < 0.01, ** p < 0.05, * p < 0.1. Weighted regressions using survey sampling weights. Regional controls were included in both regression models. CEGEP – Collège d'enseignement général et professionnel (public college in the province of Quebec).

All other results from the basic model (see Table 1) conform to standard results found in the literature. This includes that higher labour productivity and larger firm size are associated with higher export propensity which corroborates Arnold and Hussinger (2005) and Andersson *et al.* (2012), who find that more productive firms self-select into exporting, and Wolff and Pett (2000) and Orser *et al.* (2010), who find that larger firms are more likely to export. The average marginal effect indicates that export propensity increases by 2 per cent, 6 per cent and 12 per cent for each incremental change in the firm-size category relative to the base category (SMEs with 1-4 employees). For firm age, the distinction was clearly present for newly established firms, which are significantly more likely to export than older firms. Therefore, instead of using categorical variables to identify age, a dummy variable “start-up”, was used for firms two years old or less. Consistent with Orser *et al.* (2010), who found a significant and negative relationship between firm age and export propensity, our results show that start-ups are 4.1 per cent more likely to export than older SMEs.⁹ These results could support the notion of “born-global” – SMEs are established with the intent of being exporters, or as part of global value chains (WTO, 2016).

Primary decision-maker education level is also significant and positively correlated with the probability of exporting, such that SMEs managed by holders of a bachelor’s or master’s degree were respectively 5.6 and 3.2 per cent more likely to export, relative to those whose primary decision-makers only completed high school. Similarly, more years of primary decision-makers’ management experience were positively and significantly related to the probability of exporting, suggesting that accumulated human capital, potentially through stronger international orientation, increases the ability of SMEs to engage in foreign markets (Ruzzier *et al.*, 2007).

Industry of operation is also an important determinant of SMEs’ likelihood of exporting. Relative to the baseline, defined as SMEs in manufacturing (the industry with the highest probability of exporting according to descriptive data), all other sectors have a lower likelihood of exporting (hence the negative signs), so those with the highest marginal effects (or lowest absolute values) have probabilities of exporting closer to that of SMEs in manufacturing, namely transportation and warehousing (-10.6 percentage points), professional and scientific services (-12.6 per cent) and wholesale trade (-14.7 per cent). These compare with SMEs in construction (-29.6 per cent) and accommodation and food services (-25.8 per cent), who have an even lower probability of exporting.

The inclusion of variables for business behaviour (see Table 1), basic model with business behaviour variables) suggests that having an online payment feature on the firm’s website, as well as innovative activities are significant and positively correlated with the probability of exporting.¹⁰ SMEs able to engage in e-commerce are 13 per cent more likely to export. Moreover, organizational innovation increases firms’ export propensity by 14 per cent relative to firms that do not innovate. Selling innovations as well as product/process innovations also have positive impacts on export propensity, at 10 per cent and 8 per cent, respectively. The variable for women’s ownership remains not significant, showing that the fact that an SME is majority-owned by women does not change its probability to export, relative to those that are men-owned or equally owned by men and women. Other trends continue to be observed: firms that are larger, more labour-productive, younger (start-ups) and with more educated decision-makers have a higher probability of exporting. Years of management experience became significant and positively related with export propensity as e-commerce and innovation

“ While firm size has no significant correlation with digital export, specialized managerial skills, such as digital and e-commerce manager are important.

variables were included. Alternatively, size variables for SMEs with less than 100 employees were no longer significant. These changes suggest that the small size disadvantage disappears as innovation, access to e-commerce and years of management experience become more relevant. Findings from Elia *et al.* (2021), who look at determinants of digital exports (defined as systematic and strategic use of e-commerce to sell products abroad) of about 100 Italian firms, tend to support those results. The authors find that while firm size has no significant correlation with digital export, specialized managerial skills, such as digital and e-commerce manager are important, suggesting that is not resources quantity (firm size) that matters, but rather resource quality (management experience).

While the results discussed so far do not point to a statistically significant role of gender of ownership in exporting probability, the results presented in Table 2, where gender interaction variables were included, identify significant differences in business strategies between the two gender groups.¹¹

In Table 2, results from model 1 continue to support the importance of: greater labour productivity, being a start-up and having managers with more years of education and management experience. However, the interaction variables show interesting gender differences in how some firm's characteristics affect export propensity. First, consistent with previous findings, for men-owned and equally owned SMEs, larger firms are more likely to export. However, women-owned SMEs having 20-99 employees are 10 percentage points less likely to export than men-owned/equally owned SMEs, and for those with 100-499 employees, the difference is even larger, at 18 percentage points. These results suggest that for smaller firms (fewer than 20 employees), women-owned SMEs are just as likely to export as their counterparts, whereas for larger firms (20 employees or more), men-owned and equally owned SMEs are more competitive than women-owned firms in export propensity. This gender gap among larger SMEs could be due to other characteristics not measured in our model. Second, women-owned SMEs that have an online payment feature on their company's website were significantly more likely to be exporters than men-owned or equally owned SMEs that have the same feature, with a predicted probability of exporting 18 to 20 percentage points higher.¹² In addition, innovation also seems more relevant for women-owned SMEs than for men-owned/equally owned ones as it relates to exporting. Women-owned SMEs using organizational or selling innovations were respectively 9 and 8 percentage points more likely to export than their men-owned and equally owned counterparts using the same types of innovation.¹³ Perhaps due to the relatively small sample of women-owned SMEs, the gender effect mediated by size becomes not significant when innovation is specified by three type categories, (see model 2, Table 2). It is worth noting that while e-commerce and innovation increase the exporting probability of men-owned or equally owned firms, the effects are significantly stronger for women-owned SMEs. Any observed potential (e.g. size or industry) disadvantage of women-owned SMEs seems compensated by business behaviours that allow these firms to overcome barriers to export. Last, with the inclusion of gender interaction variables, the individual gender

dummy variables for women ownership becomes significant at the 10 per cent level, and bears a negative sign, suggesting that women-owned SMEs that do not engage in e-commerce or innovations are significantly less likely to export than men-owned or equally owned ones.

Table 2: Probit for probability of exporting: gender interaction

Variables	Model 1		Model 2	
	Probit coefficient	Ave. marginal effects	Probit coefficient	Ave. marginal effect
Women-owned	0.335* (0.186)	-0.0395** (0.0193)	-0.365* (0.187)	-0.0450** (0.0195)
Firm size (1-4 employees omitted)				
5-19 employees	-0.00721 (0.0997)	-0.00550 (0.0183)	-0.00841 (0.0991)	-0.00478 (0.0180)
20-99 employees	0.223** (0.109)	0.0335 (0.0224)	0.216** (0.110)	0.0334 (0.0221)
100-499 employees	0.547*** (0.138)	0.113*** (0.0355)	0.534*** (0.139)	0.117*** (0.0359)
Labour productivity	0.173*** (0.0428)	0.0361*** (0.00883)	0.174*** (0.0427)	0.0359*** (0.00873)
Women-owned and firm-size interaction				
5-19 employees	-0.127 (0.231)		-0.0986 (0.229)	
20-99 employees	-0.446* (0.269)		-0.390 (0.256)	
100-499 employees	-0.662** (0.326)		-0.472 (0.340)	
Online payment	0.277* (0.167)	0.102** (0.0434)	0.286* (0.165)	0.107** (0.0431)
Women-owned and online payment interaction	0.824** (0.344)		0.895*** (0.329)	
Innovation (no innovation omitted)				
Any innovation	0.385*** (0.0812)	0.101*** (0.0175)		
Product or process			0.386*** (0.117)	0.0740*** (0.0274)
Organizational			0.495*** (0.146)	0.141*** (0.0386)
Selling			0.334*** (0.0995)	0.0948*** (0.0219)

Variables	Model 1		Model 2	
	Probit coefficient	Ave. marginal effects	Probit coefficient	Ave. marginal effect
Women-owned and innovation interaction				
Any innovation	0.483** (0.213)			
Product or process			-0.168 (0.404)	
Organizational			0.669** (0.336)	
Selling			0.661*** (0.242)	
Education (high school omitted)				
College/CEGEP	0.0465 (0.108)	0.00856 (0.0198)	0.0495 (0.108)	0.00902 (0.0196)
Bachelor	0.234** (0.108)	0.0481** (0.0222)	0.238** (0.107)	0.0487** (0.0217)
Master or above	0.263** (0.127)	0.0552** (0.0275)	0.262** (0.128)	0.0542** (0.0275)
Years of management experience (<5 years omitted)				
5-10 years	0.556*** (0.190)	0.0920*** (0.0270)	0.577*** (0.189)	0.0940*** (0.0264)
10 years or more	0.481*** (0.177)	0.0756*** (0.0211)	0.496*** (0.175)	0.0765*** (0.0203)
Start-up	0.366** (0.157)	0.0900** (0.0442)	0.375** (0.156)	0.0920** (0.0439)
Constant	-3.095*** (0.570)		-3.098*** (0.570)	
Observations	4,498		4,498	
Pseudo R2	0.1982		0.2020	

Note: In model 1, there is no distinction among the types of innovation conducted by SMEs. In model 2, the innovation variables identify the effects of each innovation category (product or process, organizational and selling innovations). Robust standard errors in parentheses. Significance level of coefficients indicated as *** p < 0.01, ** p < 0.05, * p < 0.1. Weighted regressions using survey sampling weights. Industry and regional controls were included in both models. CEGEP – Collège d'enseignement général et professionnel (public college in the province of Quebec).

In summary, the results for export propensity suggest that when firm's characteristics are controlled for, the sole fact that an SME is majority owned by a woman does not put the firm at a disadvantage relative to its men-owned and equally owned counterparts for export propensity. However, female entrepreneurs need to be significantly more innovative and digitally engaged than male entrepreneurs in order to compete in export markets; otherwise, women-owned SMEs are less likely to export.

“ There seems to be no statistically significant difference in export intensity of women-owned SMEs relative to men-owned or equally owned ones, when firms’ and managers’ characteristics are controlled.

Export intensity: the role of education and management experience

Descriptive statistics show that the average export intensity (or export-to-sales ratio) of Canadian women-owned SMEs that exported in 2017 was 31.6 per cent, compared to 37.1 per cent for men-owned and equally owned SME exporters, and a mean test indicated that that difference is not statistically different. Nonetheless, our interest relies not only on the gender of ownership role for export intensity but also on identifying what characteristics are related the export outcome.

The equations for export intensity are presented in three model groups: basic model, basic model extension including business behaviour variables for online payment and innovation activities, and model with gender interaction variables (see Table 3). Similar to export propensity results, there seems to be no statistically significant difference in export intensity of women-owned SMEs relative to men-owned or equally owned ones, when firms’ and managers’ characteristics are controlled for (basic model) or when online payment and innovation activities are included (basic model with business behaviour variables).

Table 3: Two-part export intensity model, OLS log-transformed (first-part probit results omitted)

Variables	Conditional OLS coefficients		
	Basic	Model with business behaviour	Gender interactions
Women-owned	-0.335 (0.273)	-0.316 (0.272)	-3.044*** (0.897)
Firm size (1-4 employees omitted)			
5-19 employees	-0.157 (0.149)	-0.245 (0.169)	-0.195 (0.146)
20-99 employees	-0.0832 (0.153)	-0.0751 (0.164)	-0.107 (0.152)
100-499 employees	-0.0672 (0.242)	-0.165 (0.245)	-0.0748 (0.244)
Labour productivity	0.137** (0.0685)	0.160** (0.0755)	0.154** (0.0617)

WOMEN'S EXPORTING SUCCESS

Variables	Conditional OLS coefficients		
	Basic	Model with business behaviour	Gender interactions
Education (high school/college/CEGEP omitted)			
Bachelor	0.305* (0.158)	0.388** (0.181)	0.163 (0.148)
Master or above	0.139 (0.188)	0.275 (0.195)	0.109 (0.175)
Women-owned and education interaction			
Bachelor			1.201** (0.508)
Master or above			0.0899 (0.773)
Years of management experience (<5 years omitted)			
5-10 years	0.700* (0.405)	0.574 (0.480)	0.144 (0.260)
10 years or more	0.742* (0.397)	0.563 (0.450)	0.160 (0.218)
Women-owned and years of management experience interaction			
5-10 years			2.117*** (0.796)
10 years or more			2.382*** (0.811)
Start-up	0.669*** (0.206)	0.542** (0.263)	0.646*** (0.193)
Online payment		-0.409 (0.286)	
Innovation (no innovation omitted)			
Product		0.297 (0.284)	
Process		-0.0781 (0.222)	
Organizational		0.319 (0.218)	
Selling		0.145 (0.182)	
Constant	-3.257*** (0.804)	-3.704*** (0.961)	-2.816*** (0.781)
Observations	1,342	1,121	1,342
R-squared	0.1457	0.1559	0.1773

Note: Robust standard errors in parentheses. Significance level of coefficients indicated as *** p<0.01, ** p<0.05, * p<0.1. Weighted regressions using survey sampling weights. Industry and regional controls were included in all regressions. CEGEP – Collège d'enseignement général et professionnel (public college in the province of Quebec).

For all three models in Table 3, the size variables are not statistically significant, suggesting that having more employees has no effect on SME's export intensity. While larger firms are more likely to export than smaller ones, larger firms do not export a larger share of their sales than smaller firms. This result is consistent with other studies looking at SMEs export intensity (Kalafsky, 2004; Pla-Barber and Alegre, 2007; Şentürk and Erdem, 2008), suggesting that the increase in export intensity is non-linear and decreasing with firm size (Wagner, 2001). In turn, higher labour productivity and being a start-up (two years or less since inception) are associated with higher export intensity, also consistent with the literature. SMEs whose primary decision-maker owns a bachelor's degree had significantly higher export intensity than the base group (high school or college/CEGEP),¹⁴ while those with a master's degree or more did not have an export intensity significantly higher than the baseline.

Again, using manufacturing as the baseline industry, SMEs in wholesale trade and in professional and scientific services had the highest export intensity, while information, health and arts services, as well as accommodation and food services, had the lowest. More years of management experience is also positively linked with export intensity (basic model), but the effect is dissipated when online payment and innovation are included (business behaviour model). While online payment and innovative activities seem to be quite important for export propensity, they have no statistically significant effect on export intensity. These results go against other findings on R&D (Wagner, 2001, 2015), but Ganotakis and Love (2012) find no significant effect of internal R&D and export intensity, but observe a positive effect for e-commerce, while Hagsten and Kotnik (2017) and Sinkovics and Sinkovics (2013) find no significant effect for e-commerce.

Given their non-significance, business behaviour variables were not included in the equation with gender interactions. Interestingly, years of education as well as years of management experience were the only variables with a significant differential gender effect. Women-owned SMEs whose primary decision-maker has a bachelor's degree and more years of managing experience show higher export intensity than men-owned and equally owned SMEs with the same qualifications. Yet, these effects were not statistically significant for men-owned or equally owned SMEs. These results suggest that, despite being smaller and operating in industries less likely to export, women-owned SME exporters benefit more than their peers from more years of education and of management experience in increasing their export propensity and export intensity. Finally, while the average gender effect does not change, the dummy variable for women-owned SMEs becomes significant and negatively related with export intensity as gender interaction terms are included, suggesting that when the indirect

“ Despite being smaller and operating in industries less likely to export, women-owned SME exporters benefit more than their peers from more years of education and of management experience in increasing their export propensity and export intensity.

gender effect of education and management experience are captured, the remaining effect of women ownership on export intensity is significantly smaller than for men-owned or equally owned SMEs.

Discussion of results and topics for future research

One relevant finding of this study is the fact that online payment is not only an important factor for any SME to increase export propensity, but a lot more important for women-owned SMEs. While the presence of an online payment feature on an SME's website is an essential tool for e-commerce (APEC/USAID, 2020), it does not directly measure the magnitude of e-commerce, or its actual utilization specifically for cross-border sales. As such, it does not identify the exact mechanism through which the benefits of e-commerce are reflected in greater export propensity. Moreover, the study does not answer why export propensity is higher when online payment and innovations in organizational methods and sales are used, especially for women-owned SMEs. It is possible that selling products represents a possible path to international markets that allows women-owned SMEs to overcome observed (e.g. fewer resources in being small) and non-observed (e.g. discrimination) barriers to exporting. It is also possible that organizational and selling innovations are important activities that allow female entrepreneurs to have an online presence and export more.

While being innovative is generally related with higher productivity, which increases the likelihood that firms will overcome barriers to export, these results suggest that being able to sell products and services online decreases the fixed costs of entry on international markets. And even more so for women, suggesting that the barriers for them are even higher. In contrast, the fact that innovation and online payment were not statistically significant for increasing export intensity suggests that these activities do not appear to help firms overcome the variables costs of exporting an increase the intensive margins of trade. According to Hagsten and Kotnik (2017), online payment could be considered a technology too simple to increase firms' export intensity. More advanced Internet and digital technologies can be more effective in broadening and strengthening customer relations. This study also finds that women-owned businesses benefit from more years of education and management experience than men-owned and equally owned SMEs. One possible explanation could be that women-owned businesses are significantly smaller than their counterparts, and with fewer resources (i.e. fewer employees), they need to invest in higher quality, requiring managers with more education and experience. In contrast, men-owned and equally owned firms are larger, have more employees are likely able to afford managers with fewer years of education and experience while still performing on international markets.

Finally, the study does not provide answers to the reasons why women-owned SMEs are significantly smaller than other gender groups and are over-represented in services industries (especially retail trade). Looking at Canadian and US SMEs, Robichaud *et al.* (2015) show that firm growth is negatively related to family goals for women-owned firms, such that spending more time with family takes away time that could be devoted to the business. It is also possible that women are more risk averse than men, which could influence the sector where they choose to operate, preferring activities with a higher degree of routine, and in which firms are smaller (Marques, 2015). Huang and Rivard (2021) suggest that women-owned SMEs in Canada are not less likely to obtain credit or have a lower share of the credit requested than man-owned SMEs. However, they are more likely to be discouraged

“ This study shows that having access to an online payment website and using organizational and selling innovations, played important roles in determining success of women-owned SMEs in their probability of exporting.

borrowers, and avoid requesting credit for fear of being declined, which could potentially limit firm size and growth. Finally, women may self-select into opening a small business because they find other types of professional activities do not provide equal opportunities or are not compatible with the demands of their personal life. These are interesting topics for future research.

Conclusions

This study shows that having access to an online payment website and using organizational and selling innovations, played important roles in determining success of women-owned SMEs in their probability of exporting. Moreover, having more years of education and more years of management experience were associated with higher export intensity for women-owned SMEs relative to their counterparts.

These results have interesting policy implications, as they suggest that women-owned SMEs have different business strategies for entering export markets than men-owned or equally owned SMEs; they also rely on education and management experience a lot more than their peers to increase their export intensity. Policies that provide support for increased access to digital technology, as well as for broader types of innovation beyond products and processes, could potentially help women-owned SMEs overcome export barriers and contribute to the extensive margin of trade. Alternatively, traditional policies that promote education and give opportunities for women to gain management experience could contribute to the intensive margin of trade.

The data in this study date from 2017, so before the COVID-19 pandemic. While it is not possible to know for sure how the results presented here would have been different if the pandemic effect was accounted for, there is evidence in Canada that women-owned businesses were quite resilient and managed to increase their online sales faster than the all businesses. Data from the Canada's Survey of Business Conditions show that, between the first quarter of 2019 and the same period of 2021, the percentage of businesses that sold 10 per cent or more of their total sales online increased by 83 per cent among women-owned, compared to 41 per cent for all businesses. These numbers, however, do not show whether these women-owned businesses managed to export or not. Moreover, small businesses in the services sector, where women entrepreneurs are known to be overrepresented, were hard hit by the measures to contain the spread of the virus (Cukier *et al.*, 2022).

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Endnotes

1. SMEs are defined as firms having between 1 and 499 employees and annual gross revenue of Can\$ 30,000 or more.
2. For any given gender group, export propensity is the share of exporters among all enterprises in that group. Export intensity is the percentage of export sales in total sales of a firm.
3. Countries that specialize in commodities have lower shares of majority women-owned businesses and exporters than countries specializing in manufacturing (World Bank and WTO, 2020).
4. The percentage of SMEs with an online payment feature is highest among those that innovate in selling, at 7 per cent, but lowest among SMEs that use organizational innovation (Statistics Canada, 2017).
5. More details on sampling and methodology can be found at [https://www.ic.gc.ca/eic/site/061.nsf/vwapj/Methodology_Report_2017_eng.pdf/\\$FILE/Methodology_Report_2017_eng.pdf](https://www.ic.gc.ca/eic/site/061.nsf/vwapj/Methodology_Report_2017_eng.pdf/$FILE/Methodology_Report_2017_eng.pdf).
6. Full descriptive statistics are available from the authors upon request.
7. The SFG defines these innovations as: (i) product: new or significantly improved good or service; (ii) process: new or significantly improved production process or method; (iii) organizational: new organizational method in a firm's business practices, workplace organization or external relations resulting from a strategic decision taken by management; and (iv) selling: a new way of selling the firm's goods or services, reflecting significant changes in product design or packaging, product placement, promotion or pricing.
8. Firm age was initially included in three categories based on the number of years since the firm creation, with the baseline being firms with less than two years since establishment. However, for all regressions tested, the relationship between firm age and probability of exporting was unclear and not statistically significant.
9. Based on predicted probability results (provided upon request).
10. Due to the low count of SMEs majority-owned by women that undertook product and process innovations, it was necessary to combine the two groups to avoid confidentiality issues.
11. Interaction variables that were not statistically significant were excluded from the final regression.
12. Results available upon request.
13. Results available upon request.
14. In the export intensity analysis, the education variable was specified differently than in the export propensity analysis. For export intensity, high school and college/CEGEP categories were combined and became the baseline since these two groups seem to have more similarities in the SME exporters sample.