

Environmental Commitment and Innovation as Catalysts for Export Performance in Family Firms.

Brief Running Title: Environmental Commitment in Family Firms

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Abstract

Recognizing the extent of inconclusive findings in the environmental commitment – export performance nexus, this study examines this link in order to reduce theoretical ambiguity. The paper focuses on family firms in Poland and assesses the distinct rate of export intensity resulting from strategic commitment to environmental issues, through product innovation and process innovation. Analyzing a sample of 409 firms sourced from the World Bank Enterprise Survey database, the results indicate that strategic commitment to environmental issues encourages process innovation but not product innovation. In turn, process innovation increases export intensity while product innovation does not. It is also found that quality certifications interact with the relationship between strategic commitment to environmental issues and product innovation. These findings pose important theoretical implications and offer insights to stakeholders particularly interested in the sustainable practices of family firms.

Keywords: *Strategic Commitment to Environmental Issues; Product Innovation; Process Innovation; Quality Certification; Export Intensity; Poland.*

1. Introduction

The old portrayal of business sustainability as meeting current needs without compromising the ability of future generations to meet theirs (World Commission on Environment and Development, 1987) still provokes reflection (Henckens et al., 2016; Verma, 2019). As Zollo et al. (2013) articulate, the addition of ecological goals into firms' activities is a baseline for addressing endemic environmental challenges. Moreover, the environmental commitment, as part of the broader business sustainability agenda, is not only a matter of social responsibility but also business survival and growth, as legal and social obligations in this respect have risen (Chen and Chang, 2012). In recent years, pressure from key stakeholders including employees and customers to engage with sustainability practices has been mounting (Zeriti et al., 2014).

Such environmental commitment is to be expected in family firms considering their evocation of ethical values and responsible behavior (Blodgett et al., 2011), and the evident role of sustainability and social welfare in their operations (Bichler et al., 2021). In fact, the natural environment is of particular interest to family firms because of their long-term orientation (Lumpkin et al., 2010; Brigham et al., 2014) and commitment to stakeholders (Cennamo et al., 2012). Empirically, the evidence that family businesses are archetypal agents for environmental change is substantial (Chua et al., 1999; Carlsen et al., 2001; Grønhøj, 2006; De Massis et al., 2014). Generally, compared to their non-family counterparts, they are more likely to engage with corporate social responsibility matters (Lopez-Perez et al. 2018) and embed a circular economy model that bodes well for the environment (Ferrasso et al., 2020). There is also a dominant thesis that family businesses' inclination to pursue social goals conserves the natural environment (Delmas and Gergaud, 2014), and that they develop proactive environmental strategies (Sharma and Sharma, 2011). These tendencies could be explained by the correlations between family firms' sustainability practices, intergenerational survival and relationship building with key stakeholders in local communities (Memili, 2018). Rovelli et al. (2021) have also noted the increasing volume of literature examining family firms' corporate social responsibility.

There is a contingent of scholars that considered the commitment to environmental issues to be one that increased operational costs and reduced performance (Palmer et al., 1995; Cordeiro and Sarkis, 1997). Some also believed that it was a profitless undertaking by family firms (Zellweger et al., 2013; Seaman et al., 2018). However, over time, other scholars have demonstrated that commitment to environmental issues could, in fact, lower costs and increase

performance (Peng and Lin, 2008; Marcus and Fremeth, 2009). In theory, this suggests opportunities for a ‘virtuous trade-off’ (Koch and Lockwood, 2016: 18) that transcends the choice of underperforming in order to demonstrate environmental commitment to becoming high performing because of it. Indeed, a stream of recent studies pressing precisely this point has accrued. For example, Mezas et al. (2020: 4) argue that family ‘businesses pursue sustainability not because it is good for the world but because it is profitable’, while Xiang et al. (2020) explain that corporate social responsibility increases firm value. Likewise, Ouvrard et al. (2020) determined that environmentally conscious business operations generate improved value creation and delivery to customers. However, despite many studies intimating that there is a positive link between addressing environmental issues and business performance, the issue is still not fully understood especially when it comes to family firms (Xing et al., 2019).

Moreover, while there are suggestions of a relationship between environmental commitment and export performance (Du, 2020; Pantelaiou et al., 2020; Wang and Wang, 2020), studies probing this link are scarce (Zeriti et al., 2014). This is problematic since both the requirement and purchase of environmentally sustainable goods by international buyers has considerably increased (Li et al., 2017), especially in the case of firms in emerging markets exporting to developed economies. More importantly, consistent with the debate on the impact of environmental commitment on general performance, two conflicting views subsist (Liu and Xie, 2020). On the one hand, firms exporting products to foreign markets often have to deal with environmental regulations and institutional pressures in those countries (Leonidou et al., 2013; Zeriti et al., 2014). Consequently, this is likely to incur additional costs as firms will need to adhere to those environmental regulations, which would in turn lead to a reduction in innovation investment. On the other hand, referring to the liability of outsidership which firms often suffer from when entering international markets, such sustainability practices could generate a competitive advantage (Leonidou et al., 2013; Zeriti et al., 2014). In turn, this would help them offset such a liability and, in the long run, recover from costs incurred at earlier stages (Liu and Xie, 2020). Hence, to shed more light on this paradox, the motivation for this inquiry is to uncover how strategic commitment to environmental issues in family firms impacts on their innovation and export intensity. Our model also tests the moderating effect of quality certifications in the link between family firms’ strategic commitment to environmental issues and their potential to innovate. The attainment of environmental quality certifications is an accessory to firms’ performance (Heras-Saizarbitoria et al., 2011; Manurung et al., 2017). Being certified does not inherently confer a green disposition, but ‘it builds mechanisms that

allow the company to advance in this area in a rational and coordinated way' (Huang et al., 2014: 215).

Investigating the aforementioned issues in the family firm context is important as scholars widely agree that the control asserted by family members sets the scene for overall superior performance (Barontini and Caprio, 2006; Sacristan-Navarro et al., 2011). The notion that family firms behave differently from non-family firms in the development and delivery of product and process innovation is also not contested (De Massis et al., 2013; Nieto et al., 2015). First, we begin our inquiry with a description of the research context prior to hypotheses development reviewing the dimensions to be examined. Second, the data is described in advance of, third, an explanation of the analytic technique and, fourth, a presentation of the findings. Fifth, a discussion is initiated and followed by, last, the theoretical and practical implications arising from the study.

2. The research context

In Europe, family businesses constitute 80% of all firms and generate 55% of the European Union's [EU] gross domestic product (Surdej and Wach, 2012). Nonetheless, the activities of family firms in Eastern Europe are uncommonly reported in mainstream literature (Surdej and Wach, 2012), hence the choice of Poland as the scene of this inquiry. Habitually, academic and social commentators signpost 1989 as a watershed moment for Poland's economic and political transformation. The transition from a centrally planned to a free market economy led to a wave of new ventures (Cieslik and Kąciak, 2009), many of which were family businesses (Kowalewski et al., 2010; Baginska, 2019; Marjanski and Sułkowski, 2019). Tien et al. (2019) describe the unique traits of Polish family firms, over erstwhile underdeveloped counterparts [like Vietnam], as their adaptability to a free market system and the benefit of assimilation into the common European market. Others cited peculiarities of family firms in Poland such as an advanced skills-set and competencies among the workforce, evident multiculturalism, planned intergenerational succession and gender equality in management and operations (Tien et al., 2019). Owing to being a relatively new market society, there is also a higher concentration of first-generation family businesses in Poland that have retained a controlling stake in the firm (Kubica and Szarucki, 2016). Moreover, bearing in mind the current export focus, Wach's (2015: 37) view that 'the average time of internationalization is shorter in the case of family firms [in Poland] than non-family firms' validates the choice of setting. Finally, the target markets of Poland's exporters are mostly western European countries with Germany being by

far the most important one accounting for 28% of exports (Kirch et al., 2021). As societies in Western Europe score higher in environmental perception than in Central Europe (Poortinga et al. 2019), it could be expected that customer demand (Liao and Tsai, 2019) in these export markets plays a substantial role in the export behavior of Polish family firms.

3. Theoretical background and hypotheses development

Recognizing the lack of understanding in the ‘environmental commitment – international performance’ nexus, this study attempts to explore the theoretical base underpinning the correlations between strategic commitment to environmental issues, product and process innovation, and export intensity. Consistent with Barney’s (1986) resource-based view that valuable, rare, inimitable and non-substitutable resources are needed to develop competitive advantage, Chang (2011) suggested that environmental commitment constitutes a unique capability that is likely to generate sustained competitive advantage. Particularly, in foreign contexts, firms will need to comply with international environmental regulations in order to succeed in overseas markets. Similarly, based on the assumption that environmental commitment is positively associated with green innovation performance (Chang and Chen, 2013), it could be argued that innovation reinforces such competitive advantage. Hence, this study considers the link between strategic commitment to environmental issues and innovation as key dynamics driving international competitiveness.

Firms’ strategic commitment to environmental issues has been widely expressed and investigated as a proactive environmental strategy (Buisse and Verbeke, 2003; Aragon-Correa and Sharma, 2003; Darnall et al., 2010; Sharma and Sharma, 2011). As a variable, it tracks the presence of environmental protection initiatives within firms’ strategic planning process (Chan, 2010). Its manifestations are written and unwritten guidelines on waste and emissions reduction, closed-loop systems, analyses of product life cycle, training of employees on environmental matters and total quality environmental management (Yang et al., 2019). In this vein, environmental commitment by firms is an important strategic tool for traversing ecological challenges by assembling and deploying key resources (Gardberg and Fombrun, 2006).

Furthermore, the current review seeks to appraise the utility of quality certifications as a performance driver among family firms with an environmental purpose as contemplated by Doluca et al. (2018). In this respect, quality certifications have often been referred to as

voluntary environmental programs (Videras and Alberini, 2000). After reviewing family firms' strategic commitment to environmental issues, innovation and quality certification, it will also be pertinent to appraise how these attributes support export intensity. On this note, both Wagner (2007) and Golovko and Valentini (2014) have extolled the capacity of family firms to accelerate export activity through knowledge acquired from product and process innovation.

Turning to innovation, processes and products are considered to be keystones of this activity, although distinctively. In fact, these two types of innovation exhaust firm resources in considerably discrete ways (Rosenbusch et al., 2011; Golovko and Valentini, 2014). This is particularly relevant in the family business context because, while they tend to be resource constrained (Kraus et al., 2020), Freixanet et al. (2020) maintain that family firms convert new knowledge into product and process innovation in a disparate manner. Similarly, in the export context, Rodil et al. (2016: 251) acknowledge that ignoring this fact 'may pave the way for failures in the innovation process and, as a result of this, a low competitiveness of the firm in foreign markets'. By definition, product innovation features the introduction of new offerings or services to satisfy external demand (Querbach et al., 2020), while process innovation are incremental improvements in efficiency and productivity aimed at the reduction of average production costs (Freixanet et al., 2020). As a desired outcome, export intensity refers to firms' export sales as a percentage of total sales (Estrin, 2008). We now proceed to hypotheses development.

3.1 Strategic commitment to environmental issues and innovation

Sharma and Henriques (2005) have previously drawn parallels between managerial practices and innovation. Based on the premise that organizational commitment increases innovation performance, scholars have highlighted the relevance of this relationship relative to environmental commitment (Chang and Chen, 2013). Firms with an environmental mission are more likely to create new products that are environmentally friendly (Schaltegger and Wagner, 2011). Likewise, Surroca et al. (2010) established that firms' corporate responsibility performance stimulates the development of innovation among other factors. Precisely, they argue that environmental policy can enhance both product and process innovation. For the former, this is achieved through the creation of new environmentally friendly products with differentiated and more attractive features. As for the latter, they explained that process innovation is enhanced through an increase in material savings, reduced energy consumption,

efficient production cycles, and cost saving processes informed by environmental policies. In fact, it is recognized that innovation often seeks to improve organizational processes through cost reduction (Bessant and Tidd, 2007). To this end, Chang (2011) posits that commitment to environmental issues minimizes production waste and increases overall productivity. Accordingly, Suasana and Ekawati (2018) concluded that the higher the environmental commitment of entrepreneurs, the higher their green innovation, and the greater the success of their new products. Similarly, Chang (2011) confirmed that in manufacturing companies, corporate environmental commitment has a positive direct influence on green product innovation performance. Following such precedents, we conceptualize strategic commitment to environmental issues as a managerial practice preceding both product and process innovation. Accordingly, our first hypotheses are proposed:

H1. Strategic commitment to environmental issues is positively related to product innovation

H2. Strategic commitment to environmental issues is positively related to process innovation

3.2 Product and process innovation and export intensity

Recalling Wach's (2015) assertion that family firms in Poland are quick to enter export markets, it is timely to explore whether product and process innovation have a bearing on export intensity. Typically, the relationship between innovation and exporting is examined through the 'self-selection' vs. the 'learning-by-doing' contention (Fassio, 2018). The grounding of this study is the self-selection rather than the learning-by-exporting perspective (Sharma and Mishra, 2011; Freixanet et al., 2020). The rationale is that innovative firms are more likely to enter and sustain their involvement in international markets by overcoming the pitfalls of sunk costs (self-selection) which will, in turn, increase internationalization (Monreal-Pérez et al., 2012). Nevertheless, the learning-by-doing view still bears relevance and the two approaches may be complementary. Effectively, firms initially self-select their entry into export markets and, subsequently, increase their innovativeness through learning effects (Van Beveren and Vandenbussche, 2010). Hence, in this paper, the self-selection approach is espoused given that this is likely to occur first.

Furthermore, consistent with the resource-based view, it can be construed that internal capabilities such as innovation will add value to the firm and contribute to sustained export

activity (Penrose, 1959; Barney, 1991; Helfat and Peteraf, 2003). In international markets, innovation is considered a key source of competitive advantage (Azar and Ciabuschi, 2017). As an intangible asset, it [innovation] helps companies in the drive to sustain their competitive advantage over time through difficult to imitate and non-substitutable outputs (Hitt et al., 2001; Hitt et al., 2006). In this vein, Alvarez and Robertson (2004) posit that greater productivity through new products boosts firms' export activity. Also, Rodil et al. (2016) confirmed that innovation and exporting are positively associated. The explanation is that innovation may generate competitiveness through cost advantages derived from new and more efficient production routines [process innovation], or from the capturing of new markets [product innovation]. Either way, both forms of innovation may exclusively deliver superior performance to firms when expanding into international markets (Rodríguez and Rodríguez, 2005).

In extant empirical evidence, there is a seeming supremacy of product innovation over processes for export activity (Lewandowska et al., 2016). Without equivocation, Tavassoli (2018) asserts that it is innovation output [product innovation] and not innovation efforts [process innovation] that impacts on export behavior. Likewise, while investigating export entry, Becker and Egger (2013) stressed the importance of product innovation over process innovation. Similar claims were reported by Cassiman et al. (2010) and D'Angelo (2012) with the latter examining export intensity. Nevertheless, there is evidence supporting the important role of process innovation. For example, Sikharulidze and Kikutadze (2017) conclude that the introduction of both types of innovation is an important driver of export intensity, although they still outlined the higher contribution of product innovation. In another study, Rodríguez and Rodríguez (2005) determined that product and process innovation were altogether significant drivers of export intensity. Yet, in their analysis, Özçelik and Taymaz (2004) indicated that process innovation has a significant influence on export intensity. Lastly, Edeh et al. (2020) demonstrated that it is process innovation, rather than product innovation, that increases export performance. To address this debate, we seek to test these hypotheses:

***H3.** Product innovation is positively related to export intensity*

***H4.** Process innovation is positively related to export intensity*

3.3 Quality certification

Environmental quality certifications are often referred to as voluntary environmental programs or VEPs (Videras and Alberini, 2000). Strangely, Darnall and Sides (2008) found that VEPs

participants were 7.7% less likely to improve environmental performance than non-participants. An explanation for this paradox is Doluca et al.'s (2018:154) observation that studies such as Darnall and Sides (2008), Masurel (2007), Mir (2008) and Brammer et al. (2012), excluded and failed to recognize the stronger environmental commitment of family firms over their non-family counterparts. This stronger commitment, Doluca et al. (2018) argue, makes family firms more likely to adopt environmental quality certifications, which confer superior environmental performance over time. Certifications are an external endorsement of internal environmental management systems (Singh and Mittal, 2019). Although firms with proactive environmental strategies may obtain them voluntarily (Darnall and Sides, 2008), Christmann (2004) noted that pressure from buyers and suppliers serves as an incentive for reactive firms. Indeed, Doluca et al. (2018) suggest that quality certifications could be more or less a path to stakeholder integration. With evidence that firms with European customers are twice as likely to obtain environmental management certification (Perez-Batres et al., 2010), we aim to test whether the possession of quality certification strengthens the effect of strategic commitment to environmental issues on firms' innovation. A fifth hypothesis is proposed:

H5. Quality certifications moderate the relationship between strategic commitment to environmental issues and product and/or process innovation

3.4 Strategic commitment to environmental issues and export intensity

To close the loop, it is recognized that a direct relationship may exist between strategic commitment to environmental issues and family firms' export intensity. Particularly, there is a view that environmental commitment allows firms to gain international competitiveness and offset additional costs incurred by such commitment (Zeriti et al., 2014; Liu and Xie, 2020). To such degree, scholars have referenced the association between environmental commitment and export variables in a variety of contexts such as China (Li et al., 2017; Liu and Xie, 2020), Spain (Martín-Tapia et al., 2010) and the UK (Zeriti et al., 2014). However, studies have rarely isolated family firms as the unit of analysis for the specific measurement of export intensity as an outcome. Hence, it is opportune to interrogate this line of thinking within the context of family firms in Poland. Our concluding hypothesis checks whether:

H6. Strategic commitment to environmental issues is positively related to export intensity

4. Method

4.1 Data and measures.

Firm-level data from the World Bank Enterprise Survey (The World Bank Group, 2020) have been examined. This follows precedent in Hudson et al. (2012); Nguyen and Jaramillo (2014) and Adegboye and Iweriebor (2018). The data were collected in Poland in 2019, using stratified random sampling. In this study, firms with a maximum of 250 employees and at least a 50% ownership stake held by the same family were included. After deleting all cases with missing data, a total of 409 firms were retained. As for the measures, the model included five main variables namely, Strategic Commitment to Environmental Issues (SCEI), Product Innovation (PDTINNO), Process Innovation (PRCINNO), Export Intensity (EXP) and Quality Certification (CERTIF). All the constructs, with the exception of SCEI, were measured using single items. As for the scales used, all exogenous variables were binary¹ (Yes/No), whereas the dependent variable (EXP) had a continuous scale (0-100%). Table 1 further outlines the measures.

Table 1

Measurement Details

Variable	Items	Scales
SCEI	In the Last Fiscal Year, Did This Firm Have Strategic Objectives That Mention Environmental or Climate Change Issues?	Yes/No (1/0)
	In the Last Fiscal Year, Did This Establishment Have a Manager Responsible for Environmental and Climate Change Issues?	Yes/No (1/0)
PDTINNO	During the Last Three years, Has This Establishment Introduced New or Improved Products or Services?	Yes/No (1/0)
PRCINNO	During the Last Three Years, Has This Establishment Introduced Any New or Improved Processes?	Yes/No (1/0)
CERTIF	Does the Establishment Have an Internationally-Recognized Quality Certification?	Yes/No (1/0)
EXP	In the Last Fiscal Year, What Percentage of This Establishment's Sales Were Direct Exports?	Continuous (0-100%)

4.2 Sample characteristics

In the current sample, 61.6% of the family firms employed less than 20 workers, 28.9% had between 20 and 99 employees, and 9.5% employed between 100 and 250 workers. As for location, 43.5% were situated in central and eastern Poland, 22.9% were in the South (including the southwest), while 33.5% were in the north (including the northwest). In terms of industry,

¹ 'I don't know' answers were considered as missing data.

the vast majority of firms were in the manufacturing sector, while 30.3% were in retail and other services. Table 2 illustrates these percentages.

Table 2

Sample Characteristics

Screeners Size		
	Frequency	Percent
0-4 employees	4	1.0
5-19 employees	248	60.6
20-99 employees	118	28.9
100-250 employees	39	9.5
Total	409	100.0
Region of The Establishment		
	Frequency	Percent
Centre	85	20.8
South	55	13.4
East	93	22.7
Northwest	65	15.9
Southwest	39	9.5
North	72	17.6
Total	409	100.0
Screeners Industry (grouped)		
	Frequency	Percent
Food	68	16.6
Garments	29	7.1
Rubber & Plastics Products	37	9.0
Fabricated Metal Products	35	8.6
Machinery & Equipment	25	6.1
Furniture	45	11.0
Other Manufacturing	46	11.2
Retail	48	11.7
Other Services	76	18.6
Total	409	100.0

5. Analysis

To test the hypotheses, a multivariate statistical analysis software WarpPLS version 7.0 was employed (Kock, 2020). This is a non-linear partial least squares structural equation modelling [PLS-SEM] technique. This approach was deemed suitable for this study as it allows for the entire model to be tested at once. More importantly, WarpPLS is well suited to handle dichotomous and single item variables (Chadee and Roxas, 2013; Demek et al., 2018). In fact, models with dichotomous variables (including endogenous dichotomous) can be tested with

WarpPLS because p values are calculated via nonparametric techniques that do not assume the variables meet normality expectations. The recommended algorithm was PLS regression with a stable resampling method (Kock, 2014).

5.1. Constructs' reliability and validity

Typically, prior to path analysis, constructs' reliability and validity for latent variables are assessed. In this study, SCEI is the only latent variable and its reliability is assessed through composite reliability (CR) and Cronbach's Alpha (α), while validity is gauged with the item loadings and the average variance extracted (AVE). The variance inflation factor (VIF) is used to check collinearity for all variables; both latent and single-item. As presented in Table 3, all values meet the thresholds [i.e. 0.7 for reliability and 0.5 for AVE (Schmiedel et al., 2014) and 5 for VIF (Hair et al., 2011)].

Table 3

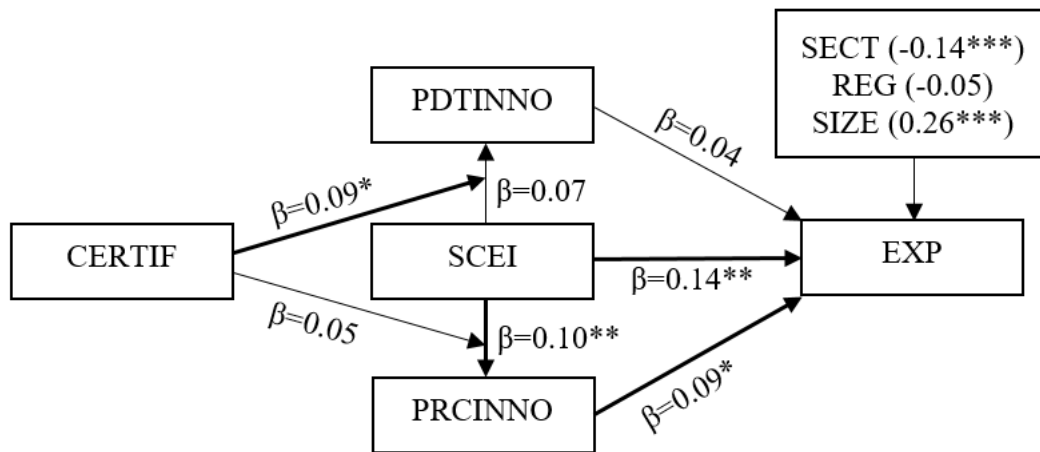
Constructs' Reliability and Validity

	<i>SCEI</i>								
<i>CR</i>	0.892								
<i>α</i>	0.758								
<i>AVE</i>	0.805								
	<i>SCEI</i>	<i>PDTINNO</i>	<i>PRCINNO</i>	<i>EXP</i>	<i>CERTIF</i>	<i>SECT</i>	<i>REG</i>	<i>SIZE</i>	<i>CERTIF*SCEI</i>
<i>VIF</i>	1.10	1.14	1.14	1.14	1.21	1.05	1.04	1.29	1.12

SCEI: Strategic Commitment to Environmental Issues; PDTINNO: Product Innovation; PRCINNO: Process Innovation; EXP: Export Intensity; CERTIF: Quality Certification; SECT: Sector; REG: Region; SIZE: Company Size.

5.2 Hypothesis testing

The structural model is evaluated through the path coefficients (β) and the p values of the relationships being hypothesized. Fig. 1 shows these values.



** $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$*

Fig. 1. Structural Model

From Fig. 1, it is deduced that strategic commitment to environmental issues holds a positive and significant influence on process innovation ($\beta = 0.10^{**}$), whereas the influence on product innovation is non-significant ($\beta = 0.07$). Furthermore, process innovation is the only type of innovation significantly and positively associated with export intensity ($\beta = 0.09^*$). As for the direct influence of strategic commitment to environmental issues, the variable has a significant and positive influence on export intensity ($\beta = 0.14^{**}$). Turning to the role of quality certification, it is concluded that the latter has a positive and significant moderating effect on the relationship between strategic commitment to environmental issues and product innovation ($\beta = 0.09^*$), whereas the interaction with the SCEI - Process Innovation link is non-significant. In summary, H2, 4, 5 and 6 are all accepted, while H1 and 3 are rejected. Regarding the control variables, sector and size have significant influences. Furthermore, the indirect link between strategic commitment to environmental issues and export intensity is non-significant. Hence, no indirect effect is proven in this study. From the R^2 , it can be concluded that the full model explains 16% of variation in export intensity.

6. Discussion and conclusion

To unravel the paradox surrounding the environmental commitment – export performance nexus (Liu and Xie, 2020), this paper has investigated the influence of strategic commitment to environmental issues on family firms' product and process innovation, and in turn, the influence of innovation on export intensity. The results indicated that strategic commitment to

environmental issues holds a positive and significant effect on process innovation, which subsequently increases the export intensity of family firms. Contrastingly, there was no significant influence of strategic commitment to environmental issues on product innovation, nor did the latter boost export intensity. This shows that Polish family firms differ from average exporters who tend to benefit more from product innovation than process innovation. Furthermore, the results suggested that strategic commitment to environmental issues does hold a positive and direct influence on family firms' export intensity. However, the mediation analysis revealed no significant indirect effect of strategic commitment to environmental issues on export intensity. As for the moderation analysis involving quality certification, it has been shown that the influence of strategic commitment to environmental issues on family firms' product innovation is significantly and positively moderated by the possession of a quality certification. These findings offer further clarification on how family firms' export intensity can be enhanced by environmental commitment and innovation activities. The succeeding sections 6.1, 6.2 and 6.3 expand on the results.

6.1. Strategic commitment to environmental issues and family firms' innovation

Despite previous evidence showing that commitment to environmental issues is likely to boost both product and process innovation [e.g. Surroca et al. (2010); Chang (2016); Suasana and Ekawati (2018)], we show that, for Polish family firms, this is only confirmed for process innovation. To corroborate Surroca et al. (2010), the adoption of environment policies brings about an increase in material savings, reduced energy consumption, efficient production cycles and cost saving routines that symbolize process innovation. The main premise here is that process innovation can be achieved through cost reduction measures prompted by a strategic commitment to environmental issues (Bessant and Tidd, 2007).

Contrastingly, the anticipated positive influence of strategic commitment to environmental issues on product innovation (Surroca et al., 2010; Schaltegger and Wagner, 2011; Suasana and Ekawati, 2018) has not materialized in the current context of Polish family firms. In fact, there is a suggestion that the peculiarities of family firms may influence internal decisions on the nature of innovation strategies pursued (Nieto et al., 2015). To some degree, family firms are often reluctant to initiate radical product innovation, and more disposed to incremental product and process innovation. This is evident, as in general, firms with limited resources are inclined toward incremental innovation (Breier et al., 2021). In this respect, De Massis et al. (2015) showed that, different to non-family firms, family firms favor incremental product

innovation over radical innovation, due to their propensity for resource preservation, the information asymmetry between family owners and non-family leaders, limited resources and the protection of socio-emotional wealth. These prevent them from venturing into radical product innovation. This opinion is also corroborated by Nieto et al. (2015) who concluded that family firms innovate at a lower rate than non-family firms. They [Nieto et al., 2015] attribute this to the costly and risky nature of such activity, which is not always possible given the limited resources of family firms and their need to disburse resources more prudently (Strobl et al., 2020). Also, risk averse family firms tend to avoid radical innovation activities because they carry a high risk of failure (Hu and Hughes, 2020). Hence, family firms' commitment to preserving wealth and their emotional attachment to the business work in concert to undermine product innovation (Munoz-Bullón and Sanchez-Bueno, 2011).

Dwelling on the subject of socio-emotional wealth and its restrictive influence on family firms' innovation activity, Calabro et al. (2019) indicate that family business owners consider big innovation projects as threats to capital and family control. Equally, Frank et al. (2019) correspond that family firms' sense of independence hinders their openness to external collaboration and innovation opportunities, which consequently slows down new product and process development. Yet, Calabro et al. (2019) also suggest that conflict within the family and different risk-taking approaches tend to engender agency costs that would eventually limit availability of resources for commitment to innovation projects. This view is also upheld by Hu and Hughes' (2020) suggestion that intra-family conflicts and differences in attitudes result in risk-aversion and short-term investment that hamper radical innovation. In this regard, Frank et al. (2019) note that the high-risk nature of innovation projects is likely to cause conflict within the family, and hence tends to be avoided.

Comparing the current finding with green product innovation discourse, Huang et al. (2016) determined that family ownership decreases firms' pursuit of green innovation, citing familiar reasons including risk aversion and the desire to preserve socio-emotional wealth. Therefore, reflecting on the evidence, it could be argued that family firms are more inclined to cost saving strategies, which potentially explains a preference for process innovation as opposed to product innovation in Poland as this study suggests. In fact, this tendency has been previously reported in Ryszko's (2014) research into the motives of eco-innovation in Polish firms. It was determined that a drive to improve market image and the prospect of decreasing cost were the most important reasons for green innovation. In addition to potential savings and decreased

costs generated by a strategic commitment to environmental issues, we find that peculiar family business characteristics [i.e. lack of resources, protection of socio-emotional wealth and risk aversion] inspire process innovation since they cut costs. In this regard, Classen et al. (2014) argue that companies may prioritize either of the two innovation types and explain, that unlike product innovation often aimed at increasing sales, process innovation is adopted to decrease labor input. They [(Classen et al., 2014)] confirmed that family firms tend to outperform their non-family counterparts in terms of process innovation. Also, it was found that the possession of a quality certification can potentially improve the relationship between environmental commitment and product innovation. This echoes Doluca et al's. (2018) view that environmental quality certifications confer superior environmental performance over time.

6.2. Family firms' innovation and export intensity

Our findings suggest that when it comes to export intensity, process innovation supersedes product innovation. It appears that investing in process innovation is more likely to enhance foreign sales than product innovation. This contrasts previous evidence suggesting that both product and process innovation are likely to increase export intensity. For example, Rialp-Criado and Komoshkova (2017) argued that offering new products or services as well as improving production processes could generate competitive advantage in both local and international markets. Also, Ganotakis and Love (2011) believed that export intensity would depend on firms' ability to satisfy international markets by either introducing new products with superior features or improved, more efficient processes. Likewise, Tavassoli (2018) ascertained that product innovation was a significant driver of export intensity.

To reconcile the above inconsistency, the nature of Polish family firms may, once more, explain disparities vis-à-vis the role of product innovation in boosting export intensity. In fact, referring back to the resource constrained nature of family firms, and especially in Poland, the costly nature of product innovation might effectively decrease export intensity and hamper international involvement. Accordingly, prior studies have shown that Polish SMEs tend to source finance internally, with the use of external finance from banks limited to less than 40% in medium-sized enterprises, and much lower in small and micro enterprises (Bank Pekao, 2020). For such reasons, Polish SMEs are undercapitalized and, faced with uncertain demand and low return on investment, eco-innovation is hampered (Ociepa-Kubicka and Pachura, 2017). Furthermore, Ingram et al. (2020) suggest that Polish family firms tend to rely on slack resources when funding innovation activity. Given these observations, it is reasonable to expect

that financing export expansion along with innovation activity poses a serious challenge for family firms in Poland. Process innovation is then a more viable pathway for family firms seeking to export.

Moreover, the results with respect to the impact of product and process innovation also diverge from earlier findings drawn from a wider population of exporters. Scholars have previously found a positive relationship between export performance and both product and process innovation among exporters from Poland (Cieslik et al., 2016) and the Visegrad countries [Czech Republic, Hungary, Poland and Slovakia] (Cieslik and Michałek, 2018). In their study of Polish manufacturers, Gajewski and Tchorek (2017) find that it is product and not process innovation that contributes to export performance. Nevertheless, Bigos and Michalik's (2020) more recent investigation of international new venture firms in Central and Eastern Europe and Central Asia uphold our findings for Polish family firms. They also determined a positive and significant relationship between exports and process innovation but not product innovation. These opposing findings could be interpreted in light of the early and fast internationalization of Polish family firms (Wach, 2015). Although our sample was not limited to international new ventures, it is reasonable to suggest that such early internationalization puts additional pressure on exporters' resource base, thus making it more difficult to facilitate product innovation and export activity simultaneously.

Drawing on previous studies in developing contexts in general, similar findings have been reported where R&D, technology and innovation were found to hold no significant influence on export performance. For instance, investigating the export survival of Chinese firms, Deng et al. (2014) showed that innovation could be detrimental, especially when exporters are not profitable. The authors cited the high sunk costs of innovation which easily outweigh the benefits arising from such activity, a phenomenon known as the 'liability of innovativeness' (Deng et al., 2014). Likewise, in Malaysia, Man (2010) fell short of proving the existence of such a link. In Ghana and Bosnia Herzegovina, Boso et al., (2013) showed that innovation was only important for export performance when firms were operating in highly competitive environments, and where customer requirement is dynamic. In Zimbabwe, Matanda et al. (2016) showed that innovativeness had a negative influence on exporting SMEs' performance, and Haddoud et al. (2019) established that, in Algeria, innovative capabilities were of low importance to export performance. Recently, results on the impact of innovation types on Nigerian SMEs' export performance confirmed that process rather than product innovation

increased export performance (Edeh et al., 2020). To explain, Edeh et al. (2020) reasoned that such findings could be due to the shortage of resources in developing markets, such as technically skilled personnel, which is vital for product innovation. Therefore, given the challenges in leveraging external funding and the reliance on own resources for innovation among Polish family firms, it could be argued that resource constraints explain why process, and not product innovation, contributes to their export intensity.

Last but not least, our findings should be interpreted in light of prior evidence on family firms' internationalization and in particular how social capital, including long-term relationships with customers, fortifies this process (Pukall & Calabro, 2014). It has been found that high customer concentration can create mutual dependence and encourage cooperation between suppliers and customers (Chang et al., 2015) leading to suppliers' investment in innovation (Krolikowski & Yuan, 2017). At the same time, cooperation with suppliers and customers is more frequently encountered in process rather than product innovation (Autant-Bernard et al., 2010). In fact, process innovation has been found to increase customer satisfaction (Simon and Yaya, 2012). This suggests that Polish family firms may be more inclined to introduce process innovation in response to customers' expectation, which in turn increases export intensity.

6.3. Strategic commitment to environmental issues and family firms' export intensity

While the mediation uncovered no indirect link between strategic commitment to environmental issues and export intensity, instead, the results revealed a positive direct influence. This coheres with previous findings (e.g. Martín-Tapia et al., 2010) showing that proactive environmental strategies positively influence firms' export intensity. Martín-Tapia et al. (2010) explain that corporate environmental strategies can increase firms' reputation particularly among large suppliers, which would facilitate access to international markets that are quite often in the developed country category. This is particularly useful given the increased environmental consciousness of consumers in importing countries, who are likely to be inclined toward 'ecological' firms (Martin-Tapia et al., 2008). Martín-Tapia et al. (2010) proceed to argue that such good reputation may exempt firms from needing to develop intensive marketing tactics. This is valuable to resource constrained family firms in Poland.

6.4. Implications

The results of this study pose theoretical implications for prior inconclusive evidence in the relationship between environmental commitment, innovation and export intensity. These thoughts and practical ramifications are now contemplated.

First, we observe that environmental commitment to strategic issues is positively related to undertaking process innovation. This aligns with the body of work arguing that process innovation plays an important role in eco-innovation, and generally associates environmental commitment with eco-innovation. Our findings underline the importance of formulating strategy to coax innovation activity in family firms. Companies that commit to environmental goals by means of specifying a strategy statement and appointing managers with responsibility for environmental issues are more likely to undertake process innovation, and there are reasons to believe that these are environmentally oriented innovation. Therefore, it can be recommended that companies aiming to increase eco-innovation should make an organizational-wide commitment and communicate their intention.

Second, we contribute to the discussion pertaining the relationship between innovation and export behavior. Taking the self-selection stance, we demonstrate that product innovation, which in other contexts fosters export intensity, might be irrelevant to Polish family firms. We therefore echo Edeh et al.'s (2020) argument that findings from developed countries in the link between innovation and export cannot be extended to less developed economies. In this study, given the link between process innovation and cost advantage (Christmann, 2000) we argue that the innovation – export nexus cannot be studied without considering the source of competitive advantage and the context in which companies operate. This is a key finding for policy development in jurisdictions such as the EU where support schemes are designed for firms from diverse backgrounds. These programs need to consider contextual differences and the unique sources of competitive advantage so as not to prioritize product innovation over process innovation. It has been argued that current measures of innovation output in the EU are imperfect. The focus on patent activity introduces bias into the evaluation of actual innovation activity and its outcomes throughout the region (Janger et al., 2017), which may adversely affect innovation policy.

Finally, we demonstrate that strategic commitment to environmental issues in family firms affects the export activity of this breed of companies. Thus, we observe that greater strategic

commitment to environmental issues is not only an ethical issue, but it opens up new avenues for growth. While the link between environmental behavior and customer expectations has been studied before, including the family firm context (Gavana et al., 2018; Liao and Tsai, 2019), we extend the discourse to export behavior. From a policy perspective, strategic commitment to environmental issues could be considered as a selection criterion in export support programs. Companies that realize the need for environmental commitment have a greater chance of increasing their presence in foreign markets, at least in places where attention to the environment plays a prominent role.

6.5. Limitations and future research directions

The study is not without limitations. It focuses exclusively on family firms from a single country (Poland). Therefore, future studies could include non-family firms and multiple countries to increase generalizability, especially in emerging contexts. By the same token, comparison of different forms of business ownership would also validate the present findings in relation to the trivial role played by product innovation in Poland. Furthermore, some of the measures applied in this research are binary which could potentially weaken observed relationships. Although preliminary Monte Carlo simulations showed that WarpPLS can test models with dichotomous variables (Kock, 2014), the present findings should be interpreted with caution. The use of alternative, non-binary measures is encouraged to confirm the current results and verify whether the absence of a mediation effect on the part of product and process innovation can be ascribed to the measures. Future research could include Likert-based measures that can capture the intensity of innovation and commitment to the environment in a more holistic manner. Additionally, given that we interpret the observed results as related to reputation effects stemming from environmental commitment, future studies could test if such reputation effects mediate the influence of environmental commitment on export intensity. Furthermore, in this study, leadership of the family firms by founders or second-generation owner/managers was not controlled for. Given the rapid formation of new ventures in Poland since 1989, it is likely that first generation family firms could still dominate our sample. As the nature of leadership may affect environmental strategy in family firms (Fan et al., 2021), controlling for this could enrich our understanding. Moreover, although we controlled for sector, region and size, it is recognized that additional factors such as firms' age and stage of internationalization could be held as constant. Therefore, future studies are invited to account for the influence of such factors. More so, we summon forthcoming studies to conduct multigroup analyses of SMEs in different stages of internationalization (e.g. regular exporters

vs. sporadic exporters, new exporters vs. experienced exporters, international new ventures vs. gradually internationalizing firms) to provide a more exhaustive understanding of the relationships under focus. Finally, while, in this study, we adopt the self-selection to exporting hypothesis over learning by exporting, we cannot rule out the reverse relationship. Therefore, longitudinal studies could examine this. In the same vein, due to the cross-sectional nature of the data, it should be noted that the relationships identified in this study are associations rather than causal links. Any reference to causality in our findings is based on theoretical underpinning

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