

Lopez-Cozar-Navarro, Cristina; Priede-Bergamini, Tiziana; Benito-Hernandez, Sonia

Article

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HOW FAMILY CHARACTER AFFECT THE FINANCING OF ENVIRONMENTAL PROTECTION STRATEGIES AND ENERGY-SAVING MEASURES

Cristina López-Cózar-Navarro^{1*} , Tiziana Priede-Bergamini² 
and Sonia Benito-Hernández³ 

^{1,3)} *University Politécnica de Madrid, Madrid, Spain*

²⁾ *University Europea de Madrid, Madrid, Spain*

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Abstract

Family firms have been consolidating for years as a very important asset in most economies in the European Union. Developing from the influence of the family on the core objectives, these firms show specific features on how internal processes are developed. These differences may also be reflected in their attitude towards corporate social responsibility and environmental policies. The present paper focusses on their behaviour on environmental responsibility, specifically referring to the energy-saving issue. Empirical results, based on a sample of 1,771 Spanish manufacturing firms, show that the family character has a positive effect on the proactive environmental strategy. Moreover, different sources of finance may alter this main effect in various ways. Unpredictably, self-financing weakens the positive effect of family ownership on environmental protection and energy saving, whereas indebtedness is not a barrier, and public support strengthens the positive relationship. Our findings contribute to better understanding the involvement of family firms in responsible behaviour and the impact of different financial sources to promote the challenge of energy for the European Union.

Keywords: Family business, environmental, energy saving, financial sources.

JEL Classification: M14, Q50, G32, H23

* Corresponding author, **Cristina López-Cózar-Navarro** – e-mail: cristina.lopezcozar@upm.es



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Introduction

Since the late eighties of the past century, the questions of why and how corporations should incorporate social and environmental issues into strategic decision making have been of great interest to managers, policymakers, and society at large. In this line, international treaties, norms, and regulations are of growing importance, and their approval and implementation today have a great impact on the business context (Doluca, Wagner and Block, 2018; Quintana, Marrchante and Benavides, 2022). Furthermore, changes in lifestyles and increased awareness among people to improve planet protection have modified consumer's demands, making innovation to generate ecological improvements (eco-innovation) increasingly important for many organisations (Aibar-Guzman et al., 2022).

In the academic context, the emerging discipline of organisations and studies of the natural environment has seen important growth. Indeed, scholars have dedicated significant efforts to understand the factors that influence the environmental strategy of a firm, by explaining how organisations operate within the ecosystem and learn how to generate natural capital for future generations (Kallio and Nordberg, 2006; Sharma and Starik, 2009). The interest in the proactive environmental strategy (PES) has itself fuelled a growing body of research and publications in the last years (Lui et al., 2019; Potrich, Cortimiglia and De Medeiros, 2019). PES are policies, practises, and routines adopted by the organisation towards improving the protection of the natural environment; this is, actions to minimise water and energy consumption, reduce waste, prevent pollution, etc. (Hart, 1995; Bansal and Roth, 2000; Aragón-Correa and Sharma, 2003). It is based on voluntary actions that go beyond merely fulfilling the legal obligations that require the commitment of all members of the organisation and an important mobilisation of resources, towards the reduction of the impact of the firms on the environment and the prevention of natural resource degradation.

Although there is a great academic interest in PES, the family business literature has conducted limited research on the issue (Doluca, Wagner and Block, 2018; Broccardo, Truant and Zicari, 2019; Miroshnychenko and De Massis, 2022), and the results obtained so far are inconclusive (Dou, Su and Wang, 2019); therefore, there is a great need to provide empirical evidence on the relationship between family ownership and PES (Agostino and Ruberto, 2021). The family firm (FF) is that in which the family actively participates in the ownership and management of the company (Rydvalová, Horynová and Zbránková, 2016; López-Cózar-Navarro, Priede-Bergamini and Benito-Hernandez, 2017; Labelle et al., 2018; Hu and Wang, 2021; Miroshnychenko and De Massis, 2022). The purpose of the present paper is to deepen our knowledge of the participation of FFs in the management of environmental responsibility and to shed light on the effort to achieve PES. Specifically, we pretend to analyse the relationship between different types of financial resources and the firm's expenses on energy saving measures.

As Sharma and Sharma (2011) point out, the impact of the engagement of FF with environmental issues on state and civil society has been clearly undervalued by researchers. Although in the last five years several papers have been published in this regard, the issue is still in its early stage and the approach to FF's sustainability is clearly scarce (Broccardo, Truant and Zicari, 2019; Agostino and Ruberto, 2021; Clauß, Kraus and Jones, 2022; Miroshnychenko and De Massis, 2022). Consequently, specialised research shows interest in energy issues. On the other hand, Eco-innovation is a risky and costly activity that requires greater financial commitment, and the results tend to emerge later in time (Paraschiv et al., 2012; Berrone et al., 2013); therefore, these types of investment require a deep analysis of

economic and financial viability. Therefore, we take the challenge to further deepen this interesting issue, aiming to describe how FFs finance environmental protection activities and the impact of these different financial sources on environmental strategies. Consequently, the paper proposes two main objectives: (1) to study whether the character of the family has a positive impact on energy saving; and (2) to study whether there is a relationship between financial resources and the character of the family on energy savings.

To reach our goals, the paper is organised as follows: in the next section, we present the literature review and the rationale for the hypotheses. Section three describes data analysis, sample, variables, and methodology. In section four the results and discussion are presented. Finally, section five contains the main conclusions, theoretical and practical implications, limitations, and future developments. Our results show that indebtedness is not a barrier to environmental protection and energy saving, while self-financing weakens the positive effect and public support strengthens the positive relationship of family ownership over PES.

1. Literature review

FFs have been consolidating for years as a very important asset of the economy, and this is true not just for the present but also for the future (Samara et al., 2018; Broccardo, Truant and Zicari, 2019). They are essential for both emerging and advanced economies. Therefore, their actions and activities have a great impact, not only on the development of their local communities, but also on the society at large (Rydvalová, Horynová and Zbránková, 2016; Agostino and Ruberto, 2021; Le Breton-Miller and Miller, 2022; Miroshnychenko and De Massis, 2022).

Arising from the influence of the family on core objectives and strategic direction of the company, FFs show differences compared with other nonfamily counterparts. These differences must also be reflected in their mission, values, their governance mechanisms, and their attitude toward corporate social responsibility (CSR) policies (Sharma and Sharma, 2011; López-Cózar-Navarro, Priede-Bergamini and Benito-Hernandez, 2017; Mazzelli, Kotlar and De Massis, 2018). Most research has shown that family-controlled firms have better social performance than non-FFs because they want to protect their Socioemotional Wealth (SEW) (Berrone et al., 2010). Consequently, in most cases, the strength of the business over time for next generations and the creation of long-term value prevail over short-term financial performance (Minichilli et al., 2016; Broccardo, Truant and Zicari, 2019). CSR is a broad concept with different dimensions, and hence the behaviour of a company can be distinct across several matters, being responsible in certain respects and not responsible in others (Rahman and Post, 2012; Hilliard and Priede, 2018), and the same occurs with FFs (Block and Wagner, 2014). Although all dimensions of CSR are important, for a few years now, concern has grown about the impact manufacturing business activities have on the planet and the environment. Thus, unlike other studies such as Block and Wagner (2014), Rees and Rodionova (2015), Laguir, Laguir and Elbaz (2016) or Martínez-Ferrero, Rodríguez-Ariza and García-Sánchez (2016), which analyse the environmental responsibility of the FFs along different dimensions of the CSR (employees, community relations, diversity, corporate governance, etc.), we specifically analyse the company's energy saving commitment independently.

If we focus in particular on aspects related to environmental protection, not many studies have relied specifically on FFs (Sharma and Sharma, 2011; Broccardo, Truant and Zicari,

2019; Clauß, Kraus and Jones, 2022; Miroshnychenko and De Massis, 2022); and, when comparing their behaviour with that of non-FFs, there is no clear consensus on the results obtained (Dou, Su and Wang, 2019). Craig and Dibrell (2006) show differences in PES between family and non-FFs; indeed, non-FFs reported higher and more significant interest in PES, but FFs demonstrated a greater ability to exploit or translate this stronger emphasis into strategic responsiveness. Therefore, PES was found to be more positively associated with firm innovation and firm financial performance in FFs. Berrone et al. (2010) compared the environmental performance between family and non-FF using a sample of 194 of US public firms in polluting industries, finding that FFs have better environmental results than their non-FF rivals, showing that the family character affects positively the environmental performance. Uhlner et al. (2012), based on a sample of 689 SMEs, found that those with greater family influence were not more likely to participate in environmental practises. However, the important interaction effect between family influence and the number of owners underpins the argument that family influence on SMEs with larger business owning families -three or more owners- has a positive effect over the engagement on environmental practises.

Rees and Rodionova (2015) found that FFs had poorer environmental performance than non-FFs. Dekker and Hasso (2016) showed that FFs had a lower focus on environmental performance compared to nonfamily firms, but not in all cases, because the engagement with the local community moderated this negative effect, displaying a higher attention to environmental performance. Doluca, Wagner and Block (2018) find that German FBs implement sustainability related measures slower than nonfamily ones, but show less instability; and, in the long term, both look to accomplish similar results in terms of environmental activities, innovations and performance. Dou, Su and Wang (2019) noticed that those firms with a long-term orientation will better adopt PES. Dangelico, Nastasi and Pisa (2019), with a sample of 14 small companies and using a multiple case study methodology, did not show significant differences between family and non-FFs regarding eco-innovations; although they encountered differences in their approach to this type of innovation in terms of firm motivation and view of green innovation.

Abeysekera and Fernando (2020), with a sample of 2,088 companies, of which 530 were family firms, find that FFs are more responsible to their shareholders than non-FFs when it comes to environmental investments. These authors suggest that when making investments in PES does not directly benefit shareholders, FFs protect shareholder interests by undertaking a significantly lower level of such investments than non-FFs. Nevertheless, Rubino and Napoli (2020) -with a sample of 83 Italian listed firms -, Agostino and Ruberto (2021) -with a sample of 41 developed, transition, and developing countries - and Benito-Hernández, López-Cózar-Navarro and Priede-Bergamini (2021) - with a sample of Spanish firms, found a positive and significant relationship between family nature and environmental protection actions. Fan, Zhang and Zhu (2021), for the Chinese context, found that FFs do not invest in a pollution prevention strategy relative to non-FFs, particularly when the Chief Executive Officer (CEO) is not the firm's founder. On the same line, Hu and Wang (2021) pointed out that FFs with greater family involvement in management tend to participate in PES; however, their findings also verify that this is not enough to account for a higher investment in PES. Aibar-Guzman et al. (2022) found that FF was negatively related to sustainable product innovation. Bendell (2022) showed that FFs were more likely to invest in environmental innovations; nevertheless, those nonfamily ones with high government engagement were indeed more likely than FFs to develop environmental innovation, with a

significant decrease in the regulatory oversight burden. Finally, Miroshnychenko and De Massis (2022), with a sample of firms from different countries, pointed out that FFs engaged less in sustainability practises than non-FFs.

Therefore, in view of the discrepancy in the literature, the first hypothesis is proposed to help shed light on this relevant issue.

H1: There is a positive relationship between family character's firms and the spending on energy saving.

Although it is true that there is widespread awareness today about the importance of the environment, and those companies who enhance their sense of environmental responsibility increase their competitive advantages, their corporate innovation capabilities, their operating results, and global firm value (Li, Liao and Albitar, 2020; Díaz-Chao, Ficopal-Cusí and Torrent-Sellens, 2021; Garcés-Ayerbe et al., 2022); it is also true that eco-innovations require investing greater resources in the short term with uncertain financial returns (Paraschiv et al., 2012; Berrone et al., 2013; Aibar-Guzman et al., 2022). In this same line, Gadenne, Kennedy and McKeiver (2009) argue about the lack of adequate financial resources as a constraint to managers when it comes to adopting an environmental responsible behaviour. Clarkson et al. (2011) show how those companies with more financial resources have higher environmental performance and vice versa. Therefore, the lack of financial resources is a clear barrier when implementing an environmental strategy (Ayuso and Navarrete-Báez, 2018; Dangelico, Nastasi and Pisa, 2019; Arranz, Arguello and Fernández De Arroyabe, 2021). However, Hu and Wang (2021) show that the available financial resources increase a firm's ability to fund projects, such as PES, although they also note that the availability of financial resources itself is not enough to trigger a high environmental investment.

Particularly for FFs, a major challenge for these firms, even by European Union policies, is access to financial resources (Michiels and Molly, 2017; Comino-Jurado, Sánchez-Andújar and Parrado-Martínez, 2021; Arzubíaga et al., 2023). In addition, these firms tend to develop their own financial culture. There is a broad consensus in the literature, given their long-term orientation, their intention to preserve family values and to transfer the business to subsequent generations- that their financial decisions tend to be more conservative than in non-FFs. Over the past few years, financial decisions of FFs have been the subject of increasing attention in the literature. For instance, Michiels and Molly (2017) develop an interesting state of the art on this topic reviewing articles published between 1977 and 2016.

More recently, De Massis et al. (2018) argue that FFs have conservative behaviour due to the desire of family owner-managers to maintain control. It is often the family's personal wealth and internal sources that are used to finance new opportunities in technological development or innovation processes, as the family is often reluctant to bring in nonfamily shareholders due to the risk of losing control; but are also unwilling to increase debt levels. Therefore, they prefer to maintain their financial independence mainly by self-financing. Le Breton-Miller and Miller (2022) point out how FFs resist incurring in debt and raising more reserves than non-FFs. Meanwhile, Baixauli-Soler, Belda-Ruiz and Sánchez-Marín (2021) show how the desire of the FF to remain in the family's hands and preserve its idiosyncrasy affects its financial decisions. In the same line, Comino-Jurado, Sánchez-Andújar and Parrado-Martínez (2021) point out that the objective of maintaining family control affects financial decisions and show how the more family members on the board of directors, the greater their influence on financial decisions.

Therefore, the literature shows great consensus on the preference for the reinvestment of profits as the main source of financing for FFs. Therefore, it is expected that to finance the necessary investments to adopt strategies that improve the protection of the natural environment, FFs use self-financing. Accordingly, the following hypothesis is formulated:

H2a: There is a positive relationship between those family character's firms with higher levels of equity and spending on energy saving.

As just shown, it is true that in the case of self-financing decisions, the literature shows a great consensus regarding the preference for the reinvestment of profits as the main source of financing; nevertheless, in the case of indebtedness, there are different positions (López-Delgado and Diéguez-Soto, 2020). On the one hand, it is considered that FFs tend not to resort to debt to maintain their financial independence to be able to preserve their values (González et al., 2013; Baixauli-Soler, Belda-Ruiz and Sánchez-Marín, 2021). However, on the other hand, they show aversion in issuing new equity to safeguard family control and ownership and maintain the business financially independent of external agents, which explains their preference for debt to finance their strategies (Burgstaller and Wagner, 2015; Cirillo et al., 2021; López-Delgado and Diéguez-Soto, 2020).

Regarding social responsibility, Clarkson et al. (2008) suggested that firms with higher leverage have a higher propensity for better environmental disclosure. Barnea and Rubin (2010) found a negative relation between debt level and CSR policies. Later, both Martínez-Ferrero, Rodríguez-Ariza and García-Sánchez (2016) and Labelle et al. (2018), particularly for FFs, also confirm the result, finding debt negatively related to corporate social behaviour. Given the conservative character of FF and its clear preference shown in the literature for self-financing, it seems logical to think that they will be reluctant to increase their level of debt to develop PES investments. In addition, it could also be considered that the most indebted family businesses prefer not to undertake investments of this type. Therefore, to analyse and clarify the influence of debt on FF environmental protection actions, the following hypothesis is presented:

H2b: There is a negative relationship between those family character's firms with higher levels of debt and spending on energy saving.

Finally, in terms of the use made by FFs of financial government support, there is also a discrepancy in the literature which justifies our interest in the research. Dou, Su and Wang (2019) focus on the long-term orientation as a positive factor concerning the adoption of PES, and recommend regional policy-makers and local governments to use monetary or non-monetary incentives, such as tax incentives, in order to encourage firms to make long-term investments towards PES. Martínez-Alonso, Martínez-Romero and Rojo-Ramírez (2019), when exploring how innovation influences sustainable economic performance, argue that decision-makers must protect FFs and their long-term orientation, offering policies and programmes that support and encourage innovation and the development of more efficient internal processes. Dangelico, Nastasi and Pisa (2019) explain the excessive bureaucracy and time that FFs find in getting public incentives and funding. Benito-Hernández, López-Cózar-Navarro and Priede-Bergamini (2021) confirm government support as significant factors for developing PES, and FFs that receive state direct and indirect funding invest more in environmental issues. While Fan, Zhang and Zhu (2021) point out that government support may have a negative effect on business attitudes toward PES; they find that increased

institutional support reduces firms' incentives to invest in PES, and this effect is greater for FFs than non-FFs.

To study the influence of government support on their environmental protection actions, the following hypothesis is presented:

H2c: There is a positive relationship between those family character's firms with higher levels of financial government support and the spending on energy saving.

2. Data Analysis and Methodology

2.1. Sample and data collection

This study uses information collected from the Survey on Business Strategies (SBS), widely used in academic research on FFs (Kotlar et al., 2014; López-Cózar-Navarro, Priede-Bergamini and Benito-Hernandez, 2017; Mazzelli, Kotlar and De Massis, 2018; Martínez-Alonso, Martínez-Romero and Rojo-Ramírez, 2019; Manzaneque et al., 2020; Priede-Bergamini, López-Cózar-Navarro and Benito-Hernández, 2020; Benito-Hernández, López-Cózar-Navarro and Priede-Bergamini, 2021; Garcés-Ayerbe et al., 2022). The information extracted corresponds to the year 2020 from a total of 1,771 companies. The SBS collects data from an annual business survey sent to a panel of Spanish manufacturing companies. Understanding the environmental strategy of manufacturing FFs is important because this sector has significant economic, but also great environmental impacts: manufacturers may consume large amounts of energy (Liu et al., 2019; Quintana, Marrchante and Benavides, 2022).

2.2. Variables and measures

The dependent variable, *expenditure on environmental protection and energy saving* (EPROTEC), is defined as a dichotomous variable following papers such as Díaz-Chao, Ficapal-Cusí and Torrent-Sellens (2021), Hu and Wang (2021), or Garcés-Ayerbe et al. (2022). The SBS allows access to this information, including a direct question on this aspect. If it takes value 1, the company spends on environmental protection activities and energy saving; in contrast, if it takes value 0, the company does not spend in this regard.

In order to build a coherent model with the objectives of the research, four explanatory variables have been chosen, each of them corresponds to one of the hypotheses that are intended to be analysed.

Family character: is a dichotomous variable (FAMILY) that explains whether the company has a family character or not (values 1 or 0), in contrast to the first hypothesis H1. This variable has been constructed from the survey, since there is a direct question about whether the company is a family firm or not, indicating that a family actively participates in the ownership and management of the company (Kotlar et al., 2014; Martínez-Ferrero, Rodríguez-Ariza and García-Sánchez, 2016; López-Cózar-Navarro, Priede-Bergamini and Benito-Hernandez, 2017; Labelle et al., 2018; Mazzelli, Kotlar and De Massis, 2018; Hu and Wang, 2021; Garcés-Ayerbe et al., 2022; Miroshnychenko and De Massis, 2022).

Equity: is a quantitative variable that includes share capital and reserves. In contrast to the second hypothesis H2a, an interaction (EQUITY * FAM) has been constructed between the variable FAMILY and the variable EQUITY. The literature widely shows preference for self-

financing in FFs, papers such as those of Michiels and Molly (2017), Baixauli-Soler, Belda-Ruiz and Sánchez-Marín (2021) and Belda-Ruiz, Sánchez-Marín and Baixauli-Soler (2022) show evidence in this regard. Consequently, we intend to obtain evidence related to self-financing and proactive environmental strategies.

Debt: is a quantitative variable that shows the level of indebtedness of the company (DEBT), representing the total amount of debts with credit institutions. Previous papers, such as those of Barnea and Rubin (2010), Martínez-Ferrero, Rodríguez-Ariza and García-Sánchez (2016) or Labelle et al. (2018), also used indebtedness in their research on responsible company behaviour. Similarly, to H2a, for the hypothesis H2b an interaction has been included (DEBT*FAM) between the variables FAMILY and DEBT.

Government support: is also a quantitative variable, that represents the total financial resources received from the state and local administration (AID). The type of support we use is public funding aimed at specific R&D activities. This variable is based on a direct question of the survey asking if the firm received grants, both state and local, for innovation activities. Other papers, such as Manzaneque et al. (2020) and Arranz, Arguello and Fernández De Arroyabe (2021), also studied public funding sources as drivers for PES investment projects. Fan, Zhang and Zhu (2021) measure institutional support by the amount of government funding transferred directly to the firms. Again, for hypothesis H2c, a new variable has been constructed (AID*FAM) which is an interaction with the variable FAMILY and the variable AID, like De Marchi (2012) and Benito-Hernández, López-Cózar-Navarro and Priede-Bergamini (2021).

In line with the previous PES literature, our paper considers control variables. Size, measured by the *asset value* (ASSET) and by the *number of employees* (EMPL); and *export propensity* (EXPORT), measured by the percentage of sales exported. Size is a determining factor when developing any business initiative, since it influences the nature and amount of available resources. Previous studies have found a positive relationship between company size and environmental strategies (Elsayed, 2006; Uhlaner et al., 2012; Garcés-Ayerbe et al., 2022; Quintana, Marrchante and Benavides, 2022). Therefore, we also expect a positive sign. Regarding export propensity, some studies have shown a positive effect on CSR practises of businesses and environmental activities (Bansal, 2005; Ayuso and Navarrete-Báez, 2018), so we also expect a positive sign for this variable. Similarly, De Marchi (2012) includes the variable, based on a question on the percentage of turnover obtained in foreign markets.

2.3. Analysis methodology

To develop the analysis, a sample of 1,771 firms was considered (Table no. 1 shows the technical data of the study). Statistical regression estimation based on the binary logistic model was used to evaluate the existence of a relationship between financial resources and PES in FFs. This type of statistical analysis is applied because the dependent variable is dichotomous, and the estimation of a model through an OLS regression analysis can produce bias, even heteroskedasticity. Thus, a symmetric distribution (standard or logistic) and a maximum-likelihood estimator must be used, as in a binary logistic model. Other related papers have employed this methodology before (Elsayed, 2006; De Marchi, 2012; Manzaneque et al., 2020; Belda-Ruiz, Sánchez-Marín and Baixauli-Soler, 2022).

Table no. 1. Technical data of the analysis

Population	
Unit	Spanish manufacturing sector
Questionnaire design	SEPI Foundation
Population types	More than 100,000 elements.
Time period	Data from 2020
Sampling	
Type of sampling	Random stratified census according to activity sector and firm size.
Sample size	1,771 Spanish manufacturing firms
Sampling error (approx.)	0.028 ($p=q=0.50$).
Level of confidence	95% ($K=2$ sigma).
Data treatment	Statistical Solutions for Products and Services (SPSS).

3. Results and discussion

The results obtained and the discussion are given below. Table no. 2 describes the descriptive statistics, and Table no. 3 the correlations between the variables.

Table no. 2. Descriptive Statistics

	Min.	Max.	Mean	Stand. dev.
EEPROTEC	0.00	1	0.54	0.49
FAMILY	0.00	1	0.43	0.49
EQUITY*FAM	0.00	1,869,369,662	24,332,975.50	97,282,432.43
DEBT*FAM	0.00	701,103,776	5,406,865.63	29,892,003.10
AID*FAM	0.00	30,459.70	75.68	905.22
EMPL	1.00	11,370	180.58	612.20
ASSET	14	5,840.0	4,124	1,551.55
EXPORT	0.00	1	0.2637	30.96

As shown in Table no. 2, 54% of the sample firms spend on environmental protection, and 43% are family firms. It can also be observed that the low level of public funding received, as well as the low average of debt and equity, may be due to the fact that the size of the companies that make up the sample is small/medium, being the average number of employees in the sample of 180. Likewise, the scope of activity of these companies is local/national for the 74%.

Table no. 3. Correlations

	ASSET	FAMILY	AID	DEBT	EXPORT	EMPL	EQUITY	EEPROTEC
ASSET	1							
FAMILY	0.012	1						
AID	-0.097**	-0.017	1					
DEBT	-0.082**	-0.006	0.522**	1				
EXPORT	-0.078**	-0.017	0.072**	0.082**	1			

	ASSET	FAMILY	AID	DEBT	EXPORT	EMPL	EQUITY	EEPROTEC
EMPL	-0.175**	-0.067**	0.534**	0.509**	0.168**	1		
EQUITY	-0.176**	-0.049*	0.226**	0.373**	0.146**	0.644**	1	
EEPROTEC	-0.029	0.053*	0.067**	0.104**	0.270**	0.171**	0.162**	1

Note: **The correlation is significant at level 0.01 (bilateral).

*The correlation is significant at level 0.05 (bilateral).

Tables no. 4 and no. 5 show the results of the model. Table no. 4 illustrate the results obtained from the regression model and Table no. 5, the level of statistical significance. A positive and significant relationship is observed between the dependent variable and the family character (B=0.299***), so hypothesis H1 can be accepted. This result contrasts with other previous papers such as Fan, Zhang and Zhu (2021) with a sample of Chinese companies, or Rees and Rodionova (2015) and Miroshnychenko and De Massis (2022), using a large sample of listed FFs from different countries, find the opposite effect. However, it follows the line of other papers with the same results, as those of Craig and Dibrell (2006), Berrone et al. (2010), Dou, Su and Wang (2019), Rubino and Napoli (2020), Agostino and Ruberto (2021) and Benito-Hernández, López-Cózar-Navarro and Priede-Bergamini (2021).

Table no. 4. Logistic regression

	B	E.T.	Wald
FAMILY	0.299***	0.105	8.100
EQUITY	0.000	0.000	0.806
EMPL	0.004***	0.001	43.510
EXPORT	0.013***	0.002	48.068
ASSET	0.000**	0.000	4.039
AID	0.001**	0.001	3.287
DEBT	0.000	0.000	0.025
Constant	-1.041***	0.177	34.530

Table no. 5. Level of the model statistical significance

-2 Verisimilitude Log	R ² Cox and Snell	R ² Nagelkerke
2,115.687(a)	0.160	0.215

A positive and significant relationship has been obtained between government financial support and companies that allocate part of their budget to energy-saving measures (B=0.001**), so the hypothesis H2c, can also be accepted, in line with other works such as those of Dou, Su and Wang (2019), Martínez-Alonso, Martínez-Romero and Rojo-Ramírez, A.A. (2019) and Benito-Hernández, López-Cózar-Navarro and Priede-Bergamini, (2021). Acceptance of H2c shows that public support for R&D activities has a clear positive influence on the motivation for environmental investment. Consequently, our research contributes to deepening the understanding of the subject. In fact, our results show that FFs find that public support is effective for the development of PES investments.

However, no significant relationship with the resources of the individual has been found, so Hypothesis H2a should be rejected. Although the literature shows a great consensus on the

preference for self-financing as the main source of financing for FFs (Michiels and Molly, 2017; Baixauli-Soler, Belda-Ruiz and Sánchez-Marín, 2021; Belda-Ruiz, Sánchez-Marín and Baixauli-Soler, 2022), it has not been possible to verify whether this has a significant positive effect when financing sustainable practises and energy saving policies of these types of companies. This result might be unexpected, insofar as it shows that, in the Spanish context, higher levels of equity in FFs are not necessarily a driver for a more PES. As we mentioned in the hypotheses formulation, a good financial health places the organisations in a better position to intensify sustainability practises; but, on the other hand, the FFs usually have fewer financial resources compared to non-FFs, and their financial decisions tend to be more conservative. Therefore, and in line with Hu and Wang (2021), our results show that the availability of own financial resources itself is not enough to ensure a higher level of investments in PES. Additionally, our results support Abeysekera and Fernando (2020), who find that FFs protect shareholder interests by undertaking a lower level of PES investments than non-FFs.

Regarding debt, the results obtained do not allow us to accept hypothesis H2b. This means that higher levels of debt do not undermine PES investments. Although previous literature shows a negative relationship between debt level and corporate social behaviour (Barnea and Rubin, 2010; Martínez-Ferrero, Rodríguez-Ariza and García-Sánchez, 2016; Labelle et al., 2018), it is encouraging to discover that, in the case of FFs, debt is not a barrier to following a proactive environmental strategy based on energy saving. This may be due to the fact that when raising debt, FFs are interested in a good environmental performance to be able to disclose environmental related matters (Clarkson et al., 2008; Rubino and Napoli, 2020).

The results obtained could be explained by the Spanish business context. In fact, our country is characterised by the majority of small and medium-sized enterprises. That is, 99% of companies that represent over 62% of gross value added and 66% of total business employment. This is clearly reflected in the size of the companies in our research sample, mostly small and medium-sized, as shown before in the sample data description.

As pointed out in the literature, size affects investment decisions in terms of environmental responsibility, since smaller firms have fewer resources than the larger ones to be able to undertake this type of investment, and, therefore, they are more conservative and reluctant to invest. As follows the literature (Paraschiv et al., 2012; Berrone et al., 2013; Aibar-Guzman et al., 2022), these are riskier and more expensive investments that also tend to be profitable in the long term or even have uncertain results. As Clarkson et al. (2011) findings suggest, although PES may be associated with the improvement of future economic performance, not all firms are able to pursue it; indeed, only firms with enough financial resources will develop PES. Therefore, it is possible that FFs within the manufacturing sector tend to be more conservative and do not use their own resources to develop PES. Our results highlight that previous studies, suggesting the preference for self-financing as the main source of financing for FFs, can lead to different evidence if tested in a different specific context.

On the other hand, those that have higher levels of debt are not necessarily less reluctant to develop this PES. With this result, it seems that FFs could be willing to finance environmental investments with external resources, against some literature results such as Martínez-Ferrero, Rodríguez-Ariza and García-Sánchez (2016) and Labelle et al. (2018), finding debt negatively related to corporate social behaviour.

Finally, as expected, public aid is the preferred source of funding to support PES. Following the argument and again given the characteristics of the companies in the sample, it is the most conservative source of financing that best suits FFs to undertake this type of investment. Thus, we understand that government support is a key factor in FFs adapting to the ecological transition.

Conclusions

Our paper examines the relationship between family ownership and energy saving expenses, describing how they finance these types of initiative. Using large sample data based on the manufacturing sector, some interesting conclusions and implications can be drawn.

Today, social pressures and well-informed consumers increasingly demand organisations to commit to environmental issues and contribute to reduce energy, as well as to achieve the 2030 United Nations Agenda for Sustainable Development. Consequently, we focused our research on deepening further responsible behaviour by FFs on environmental concerns as an interesting issue, due to the relevance of these type of firms for the European Union economies. In fact, more conceptualisation of the responsiveness of FFs is necessary for organisational theorists and practitioners to better understand the factors that foster or hinder environmental behaviour, along with the mechanisms supporting sustainable organisations. Subsequently, this information will allow researchers, managers, and policy makers to analyse, understand, identify, and implement the most effective measures, both mandatory and voluntary, to enable FFs to move towards energy saving strategies. We strongly agree with Bansal (2005) that only through such research is it possible to develop public and organisational policies that really influence corporate sustainable development.

In relation to theoretical implications, we contribute to the scientific debate mainly in two ways. First, by improving knowledge on the relationship between family ownership and firm environmental behaviour; and second, by exposing interesting arguments on the PES drivers by demonstrating the importance of government financial aid to foster energy-saving measures. We found a significantly positive association between FFs and PES. Long-term results and reputation interests incentivise FFs to invest in energy saving. It is interesting to note that the results differ from other contexts of analysis such as developing economies. Thus, our work sheds light on this discrepancy in the literature. In addition, the argument of different contexts may also explain our unexpected results regarding the sources of finance to develop energy saving. Our paper also contributes to the RBV, indicating that the availability of financial resources is relevant but not that much the origin of these resources to invest in sustainability. In fact, we might deduce that FFs develop environmental protection actions independently of financial sources. Specifically, a high level of equity is not necessarily a driver to spend on energy saving measures, but at the same time, a higher level of debt is not a barrier for FFs to develop proactive sustainable practises.

Regarding practical implications, we pretended to improve the knowledge of managers and policy makers in order to correctly advance in the promotion of sustainable FFs practises. Regarding the management implications, the managers of the FF must assume their share of responsibility and reduce the impact that their activities may cause on the environment, as well as the energy saving measure. In addition, to greater society awareness for improving planet protection, it is proven that having a responsible behaviour improves the results of the company (Li, Liao and Albitar, 2020). Our results show that, for the Spanish context,

government financial support is essential in this regard. Therefore, it is important to have a focused and well-informed management to be able to access public aid. In addition, companies that are aware of the financial incentives of government programmes are more likely to act in line with sustainability than those that are not. The family manager, in addition to maximising financial results, cares about maintaining the reputation and image of the company and desires to transmit the legacy to the next generation. In fact, FFs are able to combine these two types of objective, and this is precisely the main feature that distinguishes them from other companies.

Regarding political implications, given the importance of FFs in most European economies, any policy aimed at improving their positioning in the global economic environment should be considered a political priority for decision-makers in the European Union. It is evident that in face of environmental problems today, governments must establish rules and regulations to foster proactive environmental management, as well as support companies to overcome financial barriers, lack of information, and administrative burdens (Dangelico, Nastasi and Pisa, 2019). It is true that state granting is a form of public sector intervention in the economy, which must be used correctly and pursuing general interest objectives, in order to avoid distortions or inefficiencies that could harm free market competition.

Furthermore, community bodies of the European Union should focus their efforts on providing practical, technical, and legal advice for FFs so that they can catch up on the implementation of environmental policies, as well as promoting their awareness of the transition to resource-efficient growth. Another important aspect is the improvement of information channels so that companies know the possibilities for aid offered at community, state, and regional levels. Finally, in line with the results obtained in this article, the government must enable the appropriate sources of financing so that innovations can be developed, since FFs with higher levels of financial government support are more proactive in environmental protection strategies.

Concerning limitations and future research lines, though the sample size is acceptable for statistical analysis, it is limited to the Spanish context, and so the results may not be representative enough to explain the FF's sustainable practises for further contexts. In fact, it should be noted that the value of the constant is too high and the betas have values close to zero, which indicates that explanatory factors are missing from the model, and thus our results must be taken with caution.

Future research must consider the previous limitations and may be extended to other countries or geographical areas, and also distinguish the specific sectors of activities to which the companies belong. Other future research analysis is also proposed, with a comparative ANNOVA between family and non-family firms. Finally, given the importance we have found in public financial support, it seems interesting to dive into other possible pathways of support and their effects on sustainability practises. Moreover, this research measures the development of PES in a global sense without describing different actions. Therefore, the analysis could be extended by separating various environmental practises to analyse if there are differences in this regard.

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