Innovating with heart: family firms' decision to automate with emotional responsibility

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Abstract

Purpose – The paper aims to explore how family involvement influences family firms (FF) decisions to innovate in automation (i.e. artificial intelligence, big data and robotics). Automation implies pronounced emotional significance within the shared societal consciousness, presenting specific intricacies that pose challenges to the strategic decision-making processes of FFs.

Design/methodology/approach – This study draws on the levels of ambivalence described in the literature and the FF archetypes (i.e. enmeshed FFs, balanced FFs and disengaged FFs), which are characterised by a different relationship between the family and the firm. Empirically, this study adopts a qualitative approach, conducting three case studies involving FFs that have registered patents in automation technologies.

Findings – A distinctive pattern emerged among the different FF archetypes in their approach to innovation in automation. Innovation in automation will be limited in enmeshed FFs (based on emotional concerns at the firm level), while it will be supported in balanced FFs (based on a balanced view between emotional concerns at the family level and economic aspects at the firm level) and in disengaged FFs (based on economic considerations at the firm level).

Originality/value – Our research, focussing on the strategic choice of family firms (FFs) to innovate in automation, fills an important gap and investigates an area with relatively scant research despite the current importance of automation. Additionally, we consider the ambivalence that characterises family firms, providing a nuanced understanding of how emotional dynamics within the family-business interface influence strategic decisions.

Keywords Strategic decision, Innovation, Automation, Psychological foundation, Emotion, Ambivalence

Paper type Research paper

1. Introduction

In the context of rapidly advancing technology, family firms encounter distinct challenges and opportunities when considering automation. While automation is primarily driven by the pursuit of increased efficiency and competitiveness also in FFs (Bannò *et al.*, 2022), family-owned businesses frequently incorporate emotional and relational factors into their decision-making processes. These considerations reflect the intricate interplay of affective dynamics experienced by top executives and corporate leaders in FFs during decision-making processes to innovate, both within the firm and in their interactions with external stakeholders, including the community and society (Kim, 2012). Recognising the influence of family values and goals on innovation behaviour, our research fills a gap in comprehending family-specific factors that impact on the strategic choice of FFs to innovate in automation. The exploration of psychological aspects is thus crucial to understanding why FFs devise and pursue strategies differently from non-FFs and how different FFs exhibit distinct behaviours and strategic decisions (Jaskiewicz and Dyer, 2017), a theme gaining recognition in recent literature (Humphrey *et al.*, 2021; Picone *et al.*, 2021). Automation also emerges as a topic of pronounced

emotional significance within the shared societal consciousness, presenting specific intricacies that pose challenges to the strategic decision-making processes of FFs.

FFs, distinguished by their hybrid identity blending family and firm, play a pivotal role as emotional repositories (D'Allura and Labaki, 2018; Labaki and D'Allura, 2021). This is attributed to the unique dual role of family members who serve as decision-makers (Brundin and Sharma, 2012). The coexistence of the family and the firm systems, coupled with the family's specific role as decision-makers (where family members often hold top executive or corporate leadership positions), bestows upon FFs a heightened presence, intensity and complexity of emotions. This emphasis on the emotional landscape underscores the profound relevance of this theme within the context of FFs. Moreover, emotions flow from the family to the firm, bind the two systems, influence their behaviours and shape the interactions among decision-makers and those between the family and the firm (Labaki *et al.*, 2013). FFs are thus constantly under the persistent shadow of conflict and paradox at individual, interpersonal and organisational levels that turns (and explains) differences in their strategic behaviour (Picone *et al.*, 2021). This tension is known as ambivalence and, together with the values and beliefs of the family, shapes the strategic decision-making in FFs (Firfiray and Gomez-Mejia, 2021).

Ambivalence is a state in which individuals experience conflicting situations giving rise to complex and incongruous emotions and attitudes (Rothman *et al.*, 2017; Firfiray and Gomez-Mejia, 2021). Family owners and managers experience unique, strong and paradoxical tensions due to cognitive and social factors that derive from the inner awareness of being a family. These contradictory situations create paradoxes that explain the conflict results and behaviours of FFs (Chrisman *et al.*, 2015). We draw on the levels of ambivalence described in the literature and, specifically, on the FF archetypes proposed by Labaki *et al.* (2013) (i.e. enmeshed FFs, balanced FFs and disengaged FFs), which are characterised by a different relationship between the family and the firm, which in turn implies a different exchange of emotions between the two systems (Firfiray and Gomez-Mejia, 2021; Randerson and Radu-Lefebvre, 2021). In empirical terms, this study adopts a qualitative approach, conducting three case studies. The findings reveal distinctive patterns among the different FF archetypes in their approach to innovation in automation.

The paper is structured as follows. Section 2 reviews previous literature on ambivalence in FFs and FFs archetypes and the consequences of innovation in automation. It also presents our conceptual framework. Section 3 describes the methodology, specifically, data collection and data analysis. Section 4 presents the results. Finally, Section 5 shows relevant contributions to the literature and important managerial and policy implications.

2. Literature review
2.1 Ambivalence and FFs archetypes
Emotions play a crucial role in FFs due to their complex hybrid identity, encompassing both the family and the firm (Brundin and Sharma, 2012). The family is a normative system driven by emotions, fostering values like altruism and tradition and pursuing both emotional and economic goals (Delgado-García and De La Fuente-Sabaté, 2010), while the firm operates as a utilitarian system focused on rational principles and profit maximisation (Kets de Vries *et al.*, 2012). The flow of emotions from the family to the firm influences behaviours and shapes interactions among decision-makers and those between the family and the firm (Labaki *et al.*, 2013). Given the overlap of the two systems, FFs exhibit distinct strategic goals compared to non-FFs and FFs' decision-makers experience ambivalence in their strategic decisions.

Ambivalence can be described as a state in which an individual lives in conflicting situations that result in complex and incongruous emotions and attitudes (Rothman *et al.*, 2017) and their more roles in the family and the firm (Randerson and Radu-Lefebvre, 2021). Ambivalence is indeed the result of the conflicting priorities that derive from the two systems

(Firfiray and Gomez-Mejia, 2021). Considering the struggling role of emotions and their relevance in FFs, three archetypes of FFs have been identified (Labaki *et al.*, 2013): enmeshed FFs, balanced FFs and disengaged FFs. The three archetypes are characterised by different levels of emotions and exchange of emotions between the family and the firm systems (Labaki *et al.*, 2013).

In enmeshed FFs, there exist high levels of dependence and cohesion among family members (Olson, 2000; Olson and Gorall, 2003). These families have low levels of flexibility and adaptability, which lead to rigid and strictly defined roles, responsibilities and rules, tight control, authoritative leadership and absence of (or limited) negotiation in strategic decisions (Olson, 1989). The family and firm systems are not considered interdependent, and the support that one system can provide to the other is not seen (Distelberg and Sorenson, 2009). Emotions are translated from one system to the other as family members are willing to pay an emotional cost to the family to gain an emotional reward in the firm (Labaki *et al.*, 2013). Enmeshed FFs are characterised by low levels of ambivalence since in the firm there is a dominant and family-centred perspective (Firfiray and Gomez-Mejia, 2021).

Balanced FFs are characterised by a balanced exchange of emotions between the family and the firm (Zody *et al.*, 2006). Decision-making is independent, but strategic decisions are still taken together (Labaki *et al.*, 2013). The aim is to maintain a good balance of closeness and separation between the family and the firm (Firfiray and Gomez-Mejia, 2021). For these reasons, the level of ambivalence is medium (Distelberg and Sorenson, 2009).

In disengaged FFs, rigid boundaries exist between the family and the firm, with no interactions between the two systems and each system solely focussing on its own desires and needs (Zody *et al.*, 2006; Sundaramurthy and Kreiner, 2008). Family members do not share the goals of the firm with the consequence that personal interests of family members are pursued over the firm's benefits and conflicts emerge (Labaki *et al.*, 2013). Emotions do not flow between the family and the firm systems (Olson and Gorall, 2003). The level of ambivalence is high because the two systems are characterised by different interests, distrust and persistent conflict (Firfiray and Gomez-Mejia, 2021). The three archetypes, differing in the emotions, the level of ambivalence and the level of interaction of family and firms (Firfiray and Gomez-Mejia, 2021), influence the behaviour of FFs in many aspects, including the strategic decision to innovate in automation.

2.2 Innovation in automation: the family and the firm

Automation technologies, designed to perform work activities previously executed by workers or to increase labour productivity (Acemoglu and Restrepo, 2019), produce both negative and positive consequences. Despite some studies suggesting a positive impact of automation on firm employment (Bessen *et al.*, 2020; Domini *et al.*, 2021), other studies highlight a negative effect (Bonfiglioli *et al.*, 2020): the adoption of robots can reduce firm employment (Jung and Lim, 2020; Ballestar *et al.*, 2021) and the demand for labour through higher efficiency (Bonfiglioli *et al.*, 2020). This negative effect may also occur in labour-intensive firms (Ni and Obashi, 2021).

Automation could also affect non-pecuniary aspects that determine employees' well-being (Kaplan and Schulhofer-Wohl, 2018; Schwabe and Castellacci, 2020), specifically, job outcomes such as expectations, job prospects, satisfaction and commitment, as well as well-being outcomes including mental health and stress (Brougham and Haar, 2018). When facing the possibility of firm's automation adoption, employees may fear the risk of being displaced by machines and become unemployed (Schwabe and Castellacci, 2020). This long-term job insecurity immediately reduces job satisfaction and has a negative impact on worker's mental health due to the higher risk of psychological stress, burnout and nervousness (Chen *et al.*, 2004; Abeliansky and Beulmann, 2019).

Nevertheless, automation technologies can double labour productivity and triple total factor productivity (Stapleton and Webb, 2020), especially in larger firms thanks to their higher capital-intensity (Dinlersoz and Wolf, 2018). These negative and positive consequences of innovation in automation generate non-economic concerns and emotions in FFs.

In FFs, employees are considered part of an extended family and are taken care of (Christensen-Salem et al., 2021). FFs are highly concerned about workers' satisfaction and well-being (Kaplan and Schulhofer-Wohl, 2018; Schwabe and Castellacci, 2020) and want to assure employment stability (Stavrou et al., 2007). Regardless of economic advantages, FFs thus avoid decisions that are heartless or insensitive, imply massive layoffs or negative psychological consequences (Stavrou et al., 2007). A decision regarding automation implying negative consequences thus harms the family's relationship with employees and generates negative emotions in family members. FFs also strive to create and maintain a good family and firm image and reputation in the local community and over time: stakeholders must be constantly treated in a solicitous manner (Miller and Le Breton-Miller, 2005). Image and reputation are strongly linked to the family aim to create a solid firm for future generations (Cruz et al., 2014) and their preservation also creates a positive effect on family members' identities (Mahto et al., 2010). When facing decisions regarding automation, FFs must be therefore aware of their impact on family and firm image and reputation: any damage will cause negative emotions.

Finally, FFs strive to be recognised as an actor playing a positive role in the community (Miller and Le Breton-Miller, 2005; Cruz et al., 2014). The family wants to increase the welfare of others (e.g. employees, stakeholders, the local community) and to solve social problems exceeding the mission of the firm (Grant, 2007). Thus, the external environment strongly influences the strategic decisions and actions of FFs (Kallmuenzer et al., 2018) and special attention is given to socially responsible decisions and actions that are more socially responsible (Dyer and Whetten, 2006; Berrone et al., 2010). In the case of automation decisions, the negative effects will harm the FF's feeling to be socially responsible and cause negative emotions in family members.

2.3 Conceptual framework

Ambivalence and the three archetypes are used to understand the FFs strategic decision to innovate in automation. FFs are heterogeneous in their strategic innovation choices (Calabrò et al., 2019), so it is necessary to open the black box and identify how strategic choices change according to their characteristics. Among others, the different levels of value, belief and ambivalence within FFs (Firfiray and Gomez-Mejia, 2021) may impact on the strategic decision to innovate in automation. To consider this aspect, we rely on the three archetypes of FFs identified by Labaki et al. (2013).

In enmeshed FFs, strategic decisions prioritise preserving family harmony and maintaining the best relationships with the firm's internal and external stakeholders (Olson, 2000). Consequently, all the strategic decisions that can create disharmony are avoided (Olson and Gorall, 2003). Regarding the consequences of automation innovation, the family emotional concern in this archetype revolves around employees' fear of displacement and the potential negative effects on job satisfaction, uncertainty about future working conditions and feelings of undervaluation and unappreciation. This emotional concern is expected to limit support for innovation in automation within enmeshed FFs. Balanced FFs, characterised by a good and harmonious balance between family and firm dynamics, are expected to present favourable conditions for a strategic making process and make strategic decisions that consider both family emotional concerns and economic aspects. With a medium level of ambivalence, these FFs are positioned to support innovation in automation

by managing the emotional concerns of the family regarding the fear of the employees and their job satisfaction and acknowledging the positive economic impacts, such as labour productivity and total factor productivity. Lastly, in disengaged FFs, where emotions are not transferred between the family and the firm systems, strategic decisions are primarily driven by economic goals, with revenue being the main focus. Emotional family concerns related to caring for employees, family and firm reputation and social responsibility are thus considered absent in this archetype. Consequently, innovation in automation is supported mainly based on economic considerations (i.e. increased labour productivity and total factor productivity). Our framework is reported in Figure 1.

3. Method
3.1 Data collection
We identified potential participants among the Italian FFs that innovate in automation. Eligible firms needed to be family-owned and have registered at least one patent in automation or be in the process of patent registration. The strategy used for choosing the cases was the information-oriented selection, which aims to maximise the utility of information from small samples (Flyvbjerg, 2006). In accordance with this approach, cases were chosen based on expectations regarding their information content. Specifically, we aimed for maximum variation to glean insights into how different circumstances (in our case, varying archetypes of FFs) influence the processes and outcomes (in our case, innovation in automation) (Flyvbjerg, 2006). The family firms included in the research were selected by the authors based on the three archetypes outlined in the Introduction so that this targeted selection was aligned with the research aim.

We also consider firm size, selecting a small, a medium and a large FF. By including family firms of different sizes, we were able to capture a broader range of perspectives and experiences. Smaller firms may face different challenges and opportunities compared to larger firms, and these variations provide a more comprehensive understanding of the factors influencing their decisions. Examining firms of varying sizes enhances the generalisability of our findings. It allows us to identify patterns and trends that are not limited to a specific size of the firm, thereby making our conclusions more applicable to a wider range of family businesses. Family involvement and the relationship between family and business can be more complex in larger firms due to more intricate organisational structures and more stakeholders. Including both small and large firms helps illustrate how these complexities
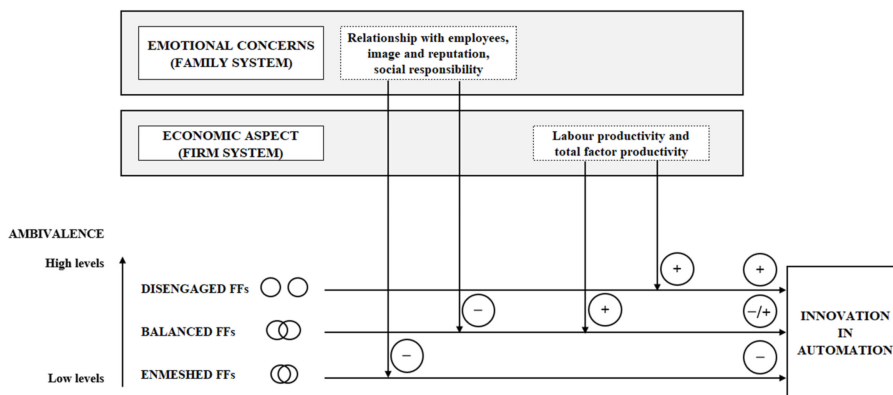
Source(s): Our elaboration

Figure 1.
Conceptual framework

influence decisions on automation differently across various contexts. Analysing firms of different sizes allows us to test the robustness of our theoretical framework. It ensures that our findings are not biased by the characteristics of firms of a particular size, thereby adding depth and credibility to our research. To ensure comparability and facilitate cross-case analyses (Yin, 2003), we limited the selection to FFs operating in the manufacturing industry.

This process led to the identification of three diverse FFs, each representing a distinct archetype:

(1) Alfa: A small domestic FF specialising in heavy machinery and spare parts for the metals industry. Experiencing rapid growth in the past five years, it currently employs 50 individuals and has registered a patent in robotics.

(2) Beta: A large multinational FF engaged in the production of sensors, controllers, indicators, power controls, drives, motion controls and automation platforms. Despite a decrease in size over the last five years, it employs 319 individuals and has registered two patents in big data.

(3) Gamma: A medium-sized multinational FF involved in the production of cutting and marking machines using laser technology. With 102 employees, it has registered a patent in robotics.

Table 1 summarises the characteristics of the selected firms for the qualitative analysis.

Our research methodology involved conducting face-to-face, in-depth, semi-structured interviews as they can elicit a free and comprehensive expression of the respondents' perspectives. The interviews targeted individuals playing pivotal roles in the decision-making processes related to innovation in automation: the family owner, who holds the authority to either promote or impede such innovation and the R&D manager, responsible for overseeing and driving the innovation process. Our study involved interviewing three family owners and three R&D managers, all actively engaged in the decision-making processes concerning innovation in automation (Table 2).

	Alfa	Beta	Gamma
Foundation year	1949	1969	1982
Family ownership	100%	51%	100%
Firm size	Medium firm	Large firm	Medium firm
Multinational (number of FDIs)	No (0 FDIs)	Yes (24 FDIs)	Yes (4 FDIs)
Industry	Heavy machinery and spare parts for the metals industry	Sensors, controllers, indicator and power control; drives and motion control; automation platform	Cutting and marking machines based on laser technology
Revenues	16,381,915	57,127,000	33,179,446
Employees	51	319	102
Growth rate of employees (five years)	−3.77%	−8.24%	12.09%
ROE	22.78%	9.56%	17.7%
Innovation (number of patents)	1	25	16
Innovation in automation (type of technology and number of patents)	Robotics (1 patent)	Big data (2 patents)	Robotics (1 patent)

Table 1.
Characteristics of selected firms

Note(s): FDI, Foreign Direct Investment; ROE, Return on Equity
Source(s): Our elaboration

		Alfa	Beta	Gamma
Family owner	Gender	Male	Female	Male
	Age	61	52	65
	Education	High school diploma	Degree in Engineering	Degree in Engineering
	Number of generations	2nd	2nd	1st
R&D manager	Gender	Female	Male	Male
	Age	42	40	55
	Education	Ph.D. in Engineering	Degree in Engineering	Ph.D. in Engineering

Source(s): Our elaboration

The interviews took place in May, 2023.

To mitigate subject bias, we implemented a courtroom style procedure during the interviews, ensuring that at least one of the authors was present (Bingham and Eisenhardt, 2011). Prior to commencing the interviews, we invested time in multiple meetings with the participants, aiming to establish a trusting relationship essential for eliciting genuine emotions and insights (Labaki, 2020).

Drawing on prior studies, we developed a comprehensive interview guideline to systematically cover all pertinent topics (De Massis and Kotlar, 2014). The interview delved into innovation in automation, exploring relationships with internal stakeholders (i.e. employees), emphasising concerns about potential impacts on employee relationships due to automation technologies. It also examined relationships with external stakeholders, highlighting the risk of compromising the family's reputation and identity. Additionally, the discussion extended to the relationship with the local community, addressing commitments to support and develop it, reflecting a sense of social responsibility. Questions were based on previous literature (Watson and Clark, 1999; Miller and Le Breton-Miller, 2005; Berrone *et al.*, 2010; Christensen-Salem *et al.*, 2021). Throughout the interviews, supportive questions such as "*What do you mean by that?*" and "*Could you please explain this in more detail?*" were employed to motivate interviewees and extract more detailed information. Furthermore, additional questions were posed whenever relevant information emerged, ensuring a thorough exploration of the topics at hand.

3.2 Data analysis
In the initial phase of our analysis, we concentrated on each case by transcribing the interviews, which ranged from 45 to 120 min and were digitally recorded. To mitigate potential errors stemming from halo effects and interpretation biases (Corbin and Strauss, 2015), only a subset of the authors, including the one who did not participate in the interviews, utilised the transcribed notes to identify how FFs act when deciding on innovation and innovation in automation. The use of triangulation, facilitated by multiple data collection methods, allowed for comparisons between information obtained from interviews within the same firm and the written records (Lee *et al.*, 1999). Utilising the transcribed notes, we constructed a preliminary framework. Subsequently, an iterative process involving the identification and marking of quotes and concepts was undertaken to identify emerging patterns or themes across interviewees within the same firm (Thomas, 2006). In the second step, we conducted a cross-case analysis to uncover regularities and patterns, identifying common and conflicting themes (Miles and Huberman, 1994). Tentative propositions were formulated, drawing from previous studies and remaining open to unexpected processes. In

the final phase, our findings were rigorously discussed and compared with existing literature to ensure reliability and validity, aligning with established case study research standards (Yin, 2003; De Massis and Kotlar, 2014).

4. Results
In this section, the themes identified are exposed through original quotations (Kallmuenzer *et al.*, 2018). The source of the quotation (role and firm of the interviewee) is indicated in brackets.

4.1 Archetypes
The gathered information facilitated the identification of the archetype for each firm.

The interviewees at Alfa indicate that Alfa is an enmeshed family firm archetype. For instance, the family owner stated:

(Family owner, Alfa) - We live for the firm, the owner lives for the firm so every decision is made for the firm because he wants it to survive.

Additionally, the R&D manager noted:

(R&D manager, Alfa) - Both the son and daughter have institutional roles (they are on the board of directors). However, the son already has his own company, so he is little involved in the operations. The daughter is not present on a daily basis. The children argue, but still the owner holds the reins of everything.

These responses reveal high levels of cohesion (Olson and Gorall, 2003) and a dominant, family-centred perspective, which reduces the level of ambivalence among decision-makers (Firfiray and Gomez-Mejia, 2021), both conditions that are necessary to consider a FF as an enmeshed archetype.

Beta is a balanced FF archetype because there is a clear boundary and a good balance of closeness and separation between the family and the firm (Olson, 1989) and strategic decisions are still taken together (Labaki *et al.*, 2013). A medium level of ambivalence exists.

(Family owner, Beta) - The role of the founder has always been instrumental in shaping the firm and its development. The close relationship that we as a family have with the managers allows us to make strategic decisions even in a single day. The governance and management structure are well formalized and structured. We believe that our family conflicts should stay out of the firm and the management should not perceive tension from us. Our commitment as a family is highly dependent on emotions and pushes us to be more productive, highly motivated and focused on our mission.

(R&D manager, Beta) - Dynamics brought the three brothers to the board and the CEO gave freedom to create a team that works with managers. Everyone wants to know and devise choices.

Gamma is a disengaged FF archetype because the family and the firm have rigid boundaries and there are no interactions between the two systems (Zody *et al.*, 2006; Sundaramurthy and Kreiner, 2008). This separation creates a high level of ambivalence.

(Family owner, Gamma) - The survival of the firm is important, but not necessarily for being inherited by my successor. The firm is important as a creature in itself. The firm can also be sold, as long as my creature is doing well and continues to exist.

4.2 Strategic decision to innovate
Based on the responses of the interviewees, the decision-making in FFs is not always rational as emotions, experiences and memories have a prominent effect, shaping and sometimes

complicating the strategic choices made by these firms (Gómez-Mejía *et al.*, 2007; De Massis and Foss, 2018).

(Family owner, Alfa) - I am very sensitive to innovation, and I have a technological soul.

(Family owner, Beta) - There are no right or wrong choices. A priori, you can't know what the best choice is and so you trust the intuition of the father.

(R&D manager, Beta) - The father sees with great pride the firm as an emanation of himself and the firm takes and provides energy. Strategic choices rest on his confidence.

(Family owner, Gamma) - This is a challenge of personal pride. A feeling of revenge and recovery pervades me.

From the family point of view, innovation is strategically to survive and compete and does not depend on the type of archetype nor to the ambivalence (Olson *et al.*, 2006).

(Family owner, Alfa) - Innovation is considered important for the much-increased competition.

(Family owner, Beta) - Innovation is strongly linked to external drive and the desire to evolve the firm over the long term. Projects have a development time of 3–5 years and a mortality rate of almost 70%, so they are very risky activities for us.

However, innovation is strongly linked to the character and emotionality of the single owner. Our respondents describes the owner in a very similar manner as we reported.

(R&D manager, Alfa) - The owner does not see the risks and does not particularly worry because he believes that there is always a solution.

(Family owner, Beta) - We want to share values. It is our model, there is no right or wrong, but we believe in the values of our family.

(Family owner, Gamma) - The push to innovate comes from creativity that restores satisfaction and reputation to the firm. My humble origins come from the industry in which I now compete, and this gives me an additional emotional drive to do well.

To make strategic decisions, interviewees name the necessity to consider both the values of the family and the main goal of the firm. In the balanced FF archetype, characterised by a shared decision-making process between family and non-family members, the ultimate responsibility for strategic decisions still belongs to the family, especially when decisions are made under conditions of great uncertainty and scarcity of information.

(Family owner and R&D manager, Beta) - Strategic decisions are often made collectively and mainly involve family managers and, depending on their social ties to the family, non-family managers. The involvement of the family is given to the strong experience of family managers and the relevance and influence of family value. We want to keep the managerial and the family levels separate. My father and I are the link between the family and the firm.

(Family owner, Beta) - Non-family managers are the key resources in the process, as they possess expertise and experience and often promote innovation. However, the one who takes responsibility for strategic choices is always the family.

Instead, both the disentangled and enmeshed archetypes are characterised by a decision-making process in which the owner predominantly chooses alone. The entrepreneur does not delegate and has relationships only with the closest top managers. Surprisingly, in enmeshed FFs, the owner is not driven in his decisions by family motives, as emerged from our respondent.

(R&D manager, Alfa) - The decision-making power is strongly in the hands of the owner. The areas on which to do research come from the exchange with just a manager who is at his side.

Instead, in disengaged FFs, the high level of ambivalence denotes a strong distinction between the family and the firm.

> (Family owner, Gamma) - The involvement of non-family managers in the strategic decision making depends on their role, expertise, and adherence to the firm's goals.

> (R&D manager, Gamma) - The owner decides and convinces himself. There is only little confrontation even with the other partners. There is some influence in the strategic choices from some people inside and outside the firm, but only if they are close.

This delineation allows for more economically driven decision-making processes, as the emotional ties and family dynamics exert less influence on business strategies.

4.3 Strategic decision to innovate in automation
Given the three archetypes, the different level of ambivalence shapes the interplay between family concerns and firm aspects (Labaki *et al.*, 2013).

4.4 Relationship with the employees
In the three archetypes, the impact of automation on employees' satisfaction and well-being is taken into account to a different extent. In enmeshed FFs, due the low level of ambivalence and the prevalence of the emotional concerns, the strategic decision to innovate in automation is influenced by the family's feeling to care for the satisfaction and well-being of their employees.

> (R&D manager, Alfa) - We all collaborate and know each other. The entrepreneur really cares about the relationship. He wouldn't be surprised if there was a knock on his door from the stockman and we wouldn't be surprised either.

In balanced FFs, the strategic decision to innovate in automation is based on the positive feelings among family owners and employees and on an offset evaluation including both family emotions and firm needs.

> (Family owner, Beta) - Employees are our firm's primary stakeholders and are considered our strength.

> (R&D manager, Beta) - We automate but we are careful about society and welfare. Automation somewhere in the world destroys jobs, but this happens abroad, in Italy it is not a problem but an opportunity.

In disengaged FFs, the main interest is the competitive advantage. Therefore, the strategic decision to innovate in automations overshadows the satisfaction and well-being of firm employees.

> (Family owner, Gamma) - Automation is a game that we need to play because otherwise other firms will overperform us.

4.5 Image and reputation
FFs hold an inner pride of building and maintaining the family and firm reputation, which may limit their innovation in automation. This is especially true for enmeshed FFs:

> (R&D manager, Alfa) - The family is well known because they have given so much work over the years. The reputation belongs to the family and it is transferred to the firm and vice versa.

The situation is different in balanced FFs and disengaged:

(R&D manager, Beta) - I have never considered a reputational risk linked to automation technologies because if we did not invest in these technologies we could not keep up with global competition, maintain jobs and gain market share.

(Family owner and R&D manager, Beta) - We support and promote innovation in automation by creating informative events.

(Family owner, Gamma) - I invest in automation because I want to leave a better world to my grandchildren and children. And then I do it for reputation.

4.6 Social responsibility
According to the answers of our respondents, the three archetypes present a similar level of social responsibility.

(Family owner, Beta) - We have conducted an analysis of all potential stakeholders (internal and external) and how we can contribute. For us, the relationship with stakeholders is essential and fundamental.

(Family owner, Gamma) - With automation we can achieve the goal of energy improvement and in general environmental sustainability and give value to stakeholders.

These responses indicate that the three archetypes present a similar level of social responsibility, which emerges as a determining factor in the strategic choice to innovate in automation. The logic behind this is that by prioritising social responsibility, these firms may be motivated to adopt automation technologies that enhance energy efficiency and environmental sustainability. This, in turn, aligns with their commitment to adding value to stakeholders and maintaining strong stakeholder relationships. Therefore, social responsibility drives their innovation strategies, particularly in adopting automation to meet these goals.

However, if automation adversely impacts employment levels, these same motivations can lead to the opposite choice. Family firms may opt against automation to preserve jobs and maintain social responsibility commitments to their employees and the community. Thus, while social responsibility drives innovation towards automation for sustainability, it can also restrain it to protect employment and social welfare.

5. Discussion
This study, by delving into the psychological foundations of strategic decisions in innovation in automation, significantly advances our comprehension of the diverse behaviours exhibited by FFs (Picone *et al.*, 2021). Specifically, we extend the current knowledge regarding the family's impact on FF innovation in automation, acknowledging that families serve as reservoirs of emotions and ambivalence influencing strategic decisions (Labaki and D'Allura, 2021). Our findings challenge the traditional notion of strategic decisions in FFs as purely rational, highlighting a substantial influence of emotions and ambivalence. By acknowledging the heterogeneity among FFs and placing a primary focus on emotional factors, we gain insights into how these factors drive distinct decisions in the context of automation.

Drawing from our results, we propose the following propositions:

P1. In enmeshed FFs, characterised by a family-centred perspective and a low level of ambivalence, socio-emotional considerations take precedence over economic aspects so that these firms will limit innovation in automation mainly based on emotional concerns (family level).

P2. Balanced FFs, characterised by medium level of ambivalence stemming from the good balance of closeness and separation between the family and the firm, will support innovation in automation in FFs based on a balanced consideration of emotional concerns (family level) and economic aspects (firm level).

P3. Disengaged FFs, characterised by a high level of ambivalence given the separation between the family and the firm, will support innovation in automation mainly based on the economic aspect (firm level).

This study is the first to empirically examine how the psychological foundation elucidates the strategic decision to innovate in automation, providing evidence for different archetypes of FFs as predictors of FF decisions. This complexity aligns with the notion that the effect of family involvement on the strategic decision of a FF is complex and heterogeneous (De Massis and Foss, 2018; Dibrell and Memili, 2019). Our framework not only guides future research on the interplay between emotions, ambivalence and strategic decisions also in different contexts of FFs, but we contribute to the new path of behavioural strategy research, especially in those contexts in which emotions emerge with high intensity as FFs and economic and non-economic goals need to find a balance. In fact, even if there is awareness that family presents psychological foundations in strategic decision-making based also on individual emotions, its role is still in the nascent stages of development (Picone *et al.*, 2021).

In the realm of automation literature, our study breaks new ground by scrutinising the strategic decision to innovate in automation, departing from the predominant focus on the consequences of automation technologies. The existing literature on automation has primarily focused on the consequences of automation technologies, including the impact on employment, firms' productivity and employees' well-being. Our study builds on this literature, revealing that economic factors do not solely influence this decision but is also significantly shaped by the emotions and ambivalence of family owners. We uncover that the multitude of conflicting goals pursued by FFs implies that their strategic decision-making in automation is intricately affected by ambivalence (Firfiray and Gomez-Mejia, 2021). If on the one hand, ambivalence implies narrow thinking, indecisiveness, uncertainty, risk perception and poor-decision-making (Rothman *et al.*, 2017); on the other hand, it may foster cognitive flexibility, divergent thinking, situational awareness and adaptive decision-making thus facilitating the management of demanding situations (Randerson and Radu-Lefebvre, 2021). For these reasons, we demonstrated that family involvement in ownership, management and governance, with the resulting ambivalence, affects innovation in automation (Chrisman *et al.*, 2015).

5.1 Contribution to literature
We contribute to the literature of FFs in different ways. This study represents a pioneering exploration into how the psychological underpinnings explain innovation in automation within FFs, answering the call for studies that link psychological foundation and the heterogeneity of FFs (De Massis and Foss, 2018). We found that different FF archetypes influence FFs' decision to innovate in automation. Thus, we confirm that the effect of family involvement on the strategic decision of FFs is complex and heterogeneous (Dibrell and Memili, 2019) and the relevance of decision-makers ambivalence in three archetypes (Labaki *et al.*, 2013). Second, the proposed framework provides a structured foundation for future research avenues, particularly in understanding the interplay between emotions, ambivalence and strategic decisions across various contexts within FFs. This contribution extends to the emerging field of behavioural strategy research, especially in contexts where emotions, as in the case of FFs, intensify and economic and non-economic objectives

must find equilibrium. Third, we contributed to the literature on automation by analysing the strategic decision to innovate in automation. Our study shows that the decision to innovate in automation is not solely influenced by the traditionally analysed (mainly economic) aspects, but on the contrary, the emotions of the family owners and ambivalence are also relevant.

5.2 Policy, managerial and social implications
Evidence from this study could be used to design policies that promote the invention and application of automation by helping firms carefully evaluate the positive and negative aspects of automation and overcome any resistance due to the influence of value, belief and ambivalence on strategic decision-making, an aspect that is particularly relevant in FFs as we have shown.

From a managerial point of view, our study highlighted the critical issues that FFs must consider when making strategic decisions to innovate in automation. The study of automation in FFs is crucial because it directly impacts the firm's success and their values and beliefs. Automation's improvements in workplace safety, product quality and productivity are often overlooked. Unlike policy interventions that may prioritise business success, recognising the positive effects of automation is essential. Hence, our study emphasises the necessity for a thoughtful approach to automation implementation aligned with familial values and objectives.

The study of automation in FFs is crucial because it directly impacts not only the success of the firm but also the broader societal context in which these firms operate. Automation's improvements in workplace safety, product quality and productivity are often overlooked. Recognising the positive effects of automation is essential for society as it ensures a balanced view of technological advancement, emphasising the broader benefits beyond mere business success.

6. Conclusion
This research provides a valuable framework for understanding the strategic decisions of FFs in the context of automation. Integrating psychological, emotional and economic perspectives offers a holistic view of the factors influencing innovation in automation within FFs. This comprehensive approach not only enriches the academic discourse on family business management but also offers practical insights for fostering innovation in this unique organisational context.

In terms of practical implications, this study's findings can inform policymakers and managers in designing strategies that promote the adoption of automation in FFs. Recognising the unique emotional and psychological dimensions of FFs can help tailor policies that address these firms' specific needs and concerns. For managers, understanding the role of emotions and ambivalence in strategic decision-making can enhance their ability to navigate the complexities of innovation in automation, balancing economic goals with the well-being of family members and employees.

While our study offers valuable insights into how family involvement influences the decision of family firms to innovate in automation, some limitations should be noted. The classification of family firms into enmeshed, balanced and disengaged archetypes is based on existing literature. However, the boundaries between these categories can be fluid, and some firms may not fit neatly into one category, potentially impacting the interpretation of our findings. As concern methodological aspect, the study is based on three case studies, which may limit the generalisability of our findings. Although the cases provide rich qualitative data, a larger sample size could provide more comprehensive and statistically significant results. Moreover, the

qualitative nature of this study, while beneficial for in-depth exploration, may introduce subjectivity and bias. Future research could complement our findings with quantitative methods to enhance the robustness and objectivity of the results. The cases selected for this study may be geographically and sector constrained, which could influence the findings. Cultural and regional factors play a significant role in business decisions, and the results might differ in different cultural or economic contexts. The rapidly evolving nature of automation technologies means that family firms' strategic decisions and attitudes towards these innovations might change over time. Longitudinal studies could provide insights into how these dynamics evolve. By concentrating on firms with registered patents in automation technologies, the study might overlook those engaging in automation without formal patent registrations. This could skew the findings towards firms more formalised in their innovation processes. By acknowledging these limitations, we hope to provide a balanced view of our study's contributions and encourage further research that addresses these constraints.

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