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The tradition-innovation paradox of family firms:

An empirical study on a sample of Italian SMEs

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ABSTRACT

The relationship between the innovation through tradition topic and family firms has become increasingly discussed in the recent years, with theoretical studies that have highlighted the possible positive effects of tradition on innovation; indeed, it is still controversial how a traditional context quantitatively impacts the family firms' lower willingness and higher ability to innovate. This is because family firms are not all equals and there are within them strong differences in term of governance structures, goals and resources. Therefore, our study aims to give an answer to such gap present in the extant literature, thanks to a sample of small and medium Italian enterprises belonging to innovative and traditional sectors. First, both the family and non-family companies have been studied compared to innovation input and to innovation conversion, proxies of the willingness and ability to innovate respectively. After that only family firms have been studied to detect how the main dimensions of family businesses heterogeneity, family involvement, long-term orientation and local embeddedness, affect the innovation paradox. The results of our research show that the traditional context confirms the family firms lower willingness to innovate, but at the same time calls into question their higher ability to exploit the innovation resources used, highlighting how also non-family firms can leverage tradition. Moreover, as regards to the heterogeneity, the level of family involvement negatively impacts on innovation, long termism negatively impacts on R&D investments and positively on R&D conversion, while local embeddedness does not show significant effects.

ABSTRACT

Il rapporto tra il tema dell'innovazione attraverso la tradizione e le imprese familiari è diventato sempre più discusso negli ultimi anni, e diversi studi teorici hanno evidenziato i possibili effetti positivi della tradizione sull'innovazione; infatti, la comprensione di come un contesto tradizionale influisca quantitativamente sulla volontà e la capacità di innovare, è ancora controversa. Questo anche perché le organizzazioni familiari non sono tutte uguali, ma presentano al loro interno forti differenze in termini di governance, obiettivi e risorse. Il nostro studio si propone quindi di dare una risposta a tale gap presente nella letteratura esistente, analizzando un campione di piccole e medie imprese italiane appartenenti a settori innovativi e tradizionali. Per cominciare, sono state confrontate le imprese familiari e non familiari rispetto agli investimenti in innovazione intrapresi e alla capacità di conversione degli investimenti, che misurano rispettivamente la volontà e la capacità di innovare. Successivamente sono state studiate solo le imprese familiari per rilevare come le principali misure della loro eterogeneità, cioè il coinvolgimento familiare, l'orientamento a lungo termine e il radicamento locale, influenzino l'innovazione. I risultati della nostra ricerca mostrano che il contesto tradizionale conferma la minore propensione all'innovazione delle imprese familiari, ma allo stesso tempo mette in discussione la loro maggiore capacità di sfruttare le risorse di innovazione utilizzate, evidenziando come anche le imprese non familiari possano fare leva sulla tradizione. Inoltre, per quanto riguarda l'eterogeneità, il livello di coinvolgimento della famiglia impatta negativamente sull'innovazione, l'orientamento a lungo termine impatta positivamente sulla capacità di

conversione e negativamente sugli investimenti in innovazione, mentre il radicamento locale non mostra nessun effetto significativo.

Life begins at the end of your comfort zone

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EXECUTIVE SUMMARY

Introduction

Family firms represent a fundamental element of the world economy and constitute more than 90% of all the active enterprises worldwide. Taking in consideration only the Italian context, according to the XII edition of AUB Observatory (Corbetta-Quarato, 2021), family businesses make up 65.6% of companies with annual turnover exceeding € 20 million, thus increasing the percentage by 10 points compared to 55.5% in 2007, and so demonstrating even higher growth rates than non-family organizations. Family firms are characterised by a strong heterogeneity within them, with differences in the behaviours that could be equal or also larger of those among family and non-family firms (Bennedsen, Perez-Gonzalez, & Wolfenzon, 2010; Chrisman & Patel, 2012). The reasons of such discrepancies are mainly clustered according to the governance systems (Carney, 2005), the goals (Chrisman et al., 2012) and the resources (Habbershon, Williams, & MacMillan, 2003), that we have decided to measure using respectively the level of family involvement, the long-term orientation and the local embeddedness. The behaviour that our research aims to assess is the relationship with innovation and tradition, analysing the role that the traditional context has on both the innovation willingness and ability.

Innovation theories in family firms

Within the boundaries of family business field, innovation behaviours led to fragmentated and contradictory results so far, due to the strong impact of family

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firms heterogeneity (Duran et al., 2016). On the one hand, some research demonstrates the negative relationship between family businesses and innovation processes. This negative influence is caused by higher agency costs caused by stronger internal conflicts between family members (Block, 2010) and mainly by the family owners tendency to avoid any risky decision that could undermine the wealth of the family and reduce the control on the company. These motivations make family companies less willing to invest in R&D if compared to non-family companies.

On the other hand, family firms are expected to be positively related to innovation due to their vision and their sustainability across generations that imply a strong long-term orientation, hence family companies are supposed to be positively related to R&D investments since these increase the economic value of the firm in the long term. In addition, Resource Based View Theory highlights the superiority of family businesses in the ability to convert innovation input, due to their resource orchestration advantage.

Since family firms' heterogeneity has been identified as the cause of such controversial behaviours, research focused at a first moment on the specific conditions and endogenous features that impact on family firms innovation. A milestone is settled by the Myopic loss aversion framework (Chrisman & Patel, 2012), which identifies that even though family goals tend to lower R&D investments in family firms, they manage to increase noticeably R&D investments when the economic performances of the company are not reached (Chrisman & Patel, 2012).

At a second moment, it has been stressed the need to deeper analyse innovation behaviours distinguishing between the different phases and processes of

innovation and not as a unique dimension any longer. The two main categories identified by literature are innovation willingness, which refers to all those processes that lead to the allocation of resources for innovation activities, and conversion of innovation input, which refers to the ability of the firm to convert the innovation resources allocated (Chrisman et al, 2015).

According to this perspective, Duran et al. (2016) synthetise the contradictory results achieved, concluding that family firms invest less resources in R&D, but they better convert innovation input into output. This effect is emphasized when the CEO is a later generational family member, and it is introduced the dependency of family firm innovation on country level factors.

Hence, the contradictory results for innovation in family firms can be interpreted by practitioner and researcher as the superior ability of family businesses to innovate and the lower willingness for family firms to do so (Chrisman et al, 2015).

The role of tradition in innovation processes

Together with family ownership, family management, long termism and many other features, also tradition influences innovation processes. A recent stream of research has born to analyse how tradition impacts and can be exploited by companies to innovate.

Past literature had always considered tradition as a threat for innovation, as relying on past knowledge leads to path-dependence, inflexibility, conservatism, inertia and core rigidity (Leonard-Barton, 1992). However, recent studies support the role of tradition and past knowledge as a key opportunity that should be exploited to successfully innovate (Messeni, Petruzzelli and Savino, 2015; De

Massis et al., 2016). The mechanisms that explain the potential of tradition in innovation processes strongly rely on the firm ability to access, use, interiorize, reinterpret and transfer temporally distant knowledge (Gurteen, 1998; Swan et al., 1999). According to this, literature claims that family businesses can have unique features and special capabilities to create links with the past, present and future (Zellweger, Nason, & Nordqvist, 2012), hence they more successfully innovate through tradition. Studies conducted on absorptive capacity (Kotlar et al., 2020) and knowledge internalization (Chirico & Salvato, 2014) provide better understanding on how knowledge flows within the company and how innovation is favoured. This theoretical reasoning reinforces the superior ability of family firms to innovate thanks to the role of tradition, and the innovation paradox of family firms is strengthened even more.

In this regard, the "Innovation Through Tradition" model, developed by De Massis et al (2016), represents one of the main frameworks in this research field, where the main sources of knowledge are represented by firm tradition and territory tradition. However still little empirical evidence has been provided by literature regarding this topic, especially considering the multitude of heterogeneity factors that can influence the results and must be taken into account during the research.

Research gap

Despite the several studies carried out, the scenario of innovation in family firms in the extant literature is still blurred and there is not a unique and shared perspective among lecturers, this because family firms are not all equals and

there are conjointly endogenous features that increase and reduce both the ability and the willingness to innovate.

Therefore, researches on family firms innovation aim at investigating the role of specific variables on innovation willingness and innovation ability. In particular, Duran et al. (2016) and Chrisman & Patel (2012) highlight the need to analyse the role of institutional and country-level variables on innovation behaviours, through the selection of specific sampling frames.

When we also consider the new conceptualized role of tradition on the innovation paradox, brought by the Innovation Through Tradition research stream, in which it is emphasized the superior ability of family firms to innovate thanks to the role of tradition, still little empirical evidence is provided. The understanding of the mechanism through which tradition affects innovation willingness and ability is not clear at all, and it is still unknown if the superior ability to innovate led by the exploitation of tradition is confirmed and accompanied by a higher willingness to do so (Chrisman et al., 2015). Furthermore, little empirical evidence has been provided regarding the relationship between family firms heterogeneity and the ability and willingness paradox, when tradition is relevant in the specific context.

To properly intercept the role of tradition in the sample without setting aside the magnitude of innovation and to follow the research direction on family firm innovation proposed by Duran et al., (2016) and Chrisman & Patel (2012), where the role of country-level variable needs to be investigated, we select for the research a sample of firms belonging to a traditional and innovative context.

These are the premises upon which this dissertation is based. The considerations mentioned above lead to the generation of the research question that is formulated as follows:

"What is the influence of a traditional and innovative context on the family firms ability and willingness to innovate?"

The research therefore contributes to provide empirical evidence on how the ability and willingness paradox varies in a specific context characterized by a high level of tradition and innovation (Chrisman et al., 2015), and on the relationship between the main variables characterising family firms heterogeneity and the ability and willingness paradox. Accordingly, a set of hypotheses has been developed to investigate the impact of family ownership, family involvement, long termism and local embeddedness on the innovation paradox.

Methodology

As specified in the previous paragraphs, in our research we focus our attention only on a specific context constituted by the industrial sectors (ATECO code) characterised by high tradition and high innovation. To identify them we have carried out a structured and consistent method based on the classification of the industries according to selected indicators, extracting the data from the AIDA and ORBIS databases. In fact, three quantitative indicators of innovativeness have been taken in consideration: R&D investments, Patent Value and Compounded Annual Growth Rate (CAGR), from which we were able to obtain a ranking of innovativeness of the sectors. Moreover, as regards to the traditionality, four qualitative parameters were employed: Presence of Primates,

Presence of Industrial Districts, Industry export shares and Golden Power in the sector, hence the sectors complied with almost one of such parameters were considered as representative of the "Made in Italy". At this point, the two analyses were combined, taking in consideration the 11 most innovative sectors, 6 of these were also traditional, and so the companies belonging to such innovative and traditional sectors were selected, for a total sample of 2165 firms which were analysed in order to spot the familiarity condition. The level of family involvement is measured through three parameters: the percentage of family members in the Board of Directors, the presence of a family CEO and the number of generations involved in the BoD. While for the long-term orientation we take in consideration the level of Capital Expenditure (Capex), since it is employed to create long-term financial health for the company. At the end the local embeddedness is measured considering if the companies are located in an industrial district, a socio-territorial entity whose firms have strong ties with the local communities (Becattini, 1989). Regarding the dependant variables, according to the extant literature, the innovation input is measured through the R&D expenses, while the conversion with the number of granted publications divided by the R&D expenses of the previous year.

Findings

The findings section goes through the presentation of the quantitative results of the analysis. An initial paragraph is devoted to illustrating the investigated variables through descriptive statistics and graphical representations. These last ones describe the most relevant cross-tabulations produced between some dependent and independent variables, and they provide a more comprehensive

overview of the sample. The other paragraphs move the attention to the examination of the statistical regression models, performed through the Ordinary Least Square regressor, which can be classified in three groups: the first group of models regards the impact of family ownership on innovation paradox, the second analyses the impact of family heterogeneity on innovation willingness and the last on innovation ability. Significant relationships have been found within each model, with particular mention to the confirmed lower willingness of family firms to innovate and to the increase of conversion ability if firm age grows; we assist to an increase of 10% of the innovation conversion when firm age increases by 25%. As well as this, it is relevant the negative impact of family members both on R&D investments and R&D conversion, the unexpected negative effect of long-term orientation on R&D investments and the absence of any relationship between local embeddedness and innovation.

Discussion

The discussion section synthetizes the results obtained from the quantitative models, to give a comprehensive answer to the research question and the hypotheses formulated. First, the effect of family ownership on the innovation paradox is explained, then the focal point moves only to family firms, analysing the impact of the independent variables (Composition of the Board of Directors; Long termism; Local embeddedness) on innovation willingness and ability. As regard to the impact of family ownership on R&D investments, it is confirmed the lower innovation willingness of family firms, that still invest less resources in R&D regardless the high investments of the industry, due to their strong risk aversion caused by the prioritization of the Socio-Emotional wealth rather than

economic goals (Chen & Hsu, 2014; Duran et al, 2016). As regard to innovation ability, differently to what hypothesized, in a traditional context there is no better ability of family firms to innovate. This means that the higher capacity to create long term relationships, the prevalent driver that allows companies to exploit the advantages of tradition, is no longer in the hands of family firms only. Differently, the positive and significant relation of R&D conversion with "Firm age" ($\beta = 0{,}436$; p-value $< 0{,}05$) explains that long term relationships are achieved through years and are increased with the age, the experience and the knowledge of the firm, not with family owners. This opens further possibilities for non-family companies and threatens family firms at the same time.

When the focus turns into the impact of the family firms heterogeneity on the innovation paradox, interesting results emerge. First of all, the family involvement in the BoD and the presence of a family CEO confirm to negative influence the amount of R&D investments, as they prioritize the maintenance of control over the firm and the protection of the socioemotional wealth instead of economic growth and risky decisions. The impact of the number of generations instead remains unexplained and controversial, as both the heterogeneity of the BoD that generates innovative ideas stimulating innovation, and the difficulty to create a strategic consensus generating internal conflicts that result in a plain status quo with little innovation ideas, coexist.

Concerning innovation ability, while the family CEO, as expected, positively affects innovation ability by providing the company its superior ability and knowledge, the unexpected negative relations of family involvement and number of generations show unknown mechanisms led by the traditional context. The first is due to the higher sensation of power distance between family

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and non-family managers, led by the family involvement, which results in a reduced incentive for lower hierarchical levels to contribute to knowledge exploitation, lowering the realized absorptive capacity (Kotlar et al., 2020). In a traditional context, where knowledge is essential to innovate (Hibbert and Huxham, 2011), the negative effect obtained is emphasized by this mechanism. The second refers to the tendency of family firms to hire family members (Webb, Ketchen, & Ireland, 2010) which leads to a more homogenous composition of the board of directors that results in the lack of competences needed to orchestrate resources and to successfully innovate. Last, the number of familiar conflicts, boosted from the higher percentage of family members, increases the agency costs, reducing the firm ability to effectively innovate.

Also Long termism impact on the innovation paradox of family firms. A long-term orientation increases the willingness to create long-term relationships with internal and external stakeholders. The creation of better relationships with customers and suppliers provides the company with resources and knowledge not easily available on the market (Rothamaermel & Hess, 2007) which can be used to better innovate.

Contrastingly, long-term orientation in traditional context reduces R&D investments. The tendency to overvalue and strongly rely on the elements of tradition from the past, reduces the willingness to invest in new and innovative ideas to guarantee results in the long term. Therefore, our results show that firms risk attitude in traditional and innovative context is mainly explained by the variation of the firm performances (Chrisman & Patel, 2012; Kotlar et al., 2014). Accordingly, it is proved evidence of that variation considering the ROA, which decreases by a coefficient $\beta = -0,052$ the amount of R&D investments.

The last relevant outcomes concern the absence of any impact of the local embeddedness (measured as the presence in Industrial districts) on innovation investments and conversion. It would be useful for further research to repropose the analysis enlarging the concept of local embeddedness toward other physical and digital environments.

The massive public and private innovation investments of this period make these results particularly suitable for managers who have to deal with family firms in traditional contexts, due to the following reasons. First, managers are aware of the family firm's tendency to prioritize family goals and to preserve socio-emotional wealth, even in traditional contexts. Second, to increase the ability to innovate, managers must always consider the perceived power distance caused by the percentage of family members and the number of generations in the board of directors to prevent lower hierarchical level employees to be demotivated, reducing the exchange of information and the innovation conversion. Third, it expands the opportunities of tradition for innovation also to non-family firms, which might also create new risks for family firms.

Conclusion

To conclude, our goal to provide empirical evidence regarding the ability – willingness paradox in family firms companies where the role of tradition is relevant, has led to new important results. Through the outcomes of the regression models, we discover the loss of the superior ability of family firms to innovate, the negative relation of family involvement on innovation ability and the absence of any relationship between the presence in industrial districts and innovation.

However, this research has of course some limitations. The most important ones are due first to the missing or inaccuracy of the data, which have led to a strong reduction of the sample, and second to the methodology used to select the traditional context. The value of this dissertation is built upon the specific firms sample that aims at intercepting the tradition of the Italian scenario through a systematical approach. Of course, there is not a standard methodology to identify a traditional context, therefore future research can focus on the use of other proxies for the selection of the traditional context, to confirm the results of this dissertation and define a systematic way to measure tradition. In addition, due to the lower-than-expected ability to innovate of family firms, further research can investigate the elements that favour the transmission of tradition in traditional contexts both for family and non-family companies.

1. INTRODUCTION

Family businesses represent undoubtedly an important component of the economic and social development of the present world. Different authors in the early '90, like Alfred Chandler (1990), depicted family firms as "relics" of a previous era, without the capacity to collect funds and talent, destined to be left on the fringes of the modern markets by public companies, owned by different shareholders and administrated by professional managers. But while they were right about the growth of public companies, they were wrong about family firms. In fact, in a special report released by the Economist in 2015[1], it is highlighted that family firms constitute more than 90% of all active enterprises in the world. While taking in consideration only the top companies (revenues over $1 billion), family firms are the 33% of American and the 40% of the German and French enterprises and such percentage grows even more in Brazil and Asia. Moreover, according to the XII edition of AUB Observatory (Corbetta & Quarato, 2021), the family businesses represent the 28.3% of the top 1000 French companies by turnover, the 39.5% of the German ones, the 43.7% of the Italian ones and the 35.4% of those in Spain. In particular, in Italy family firms represent the 65.6% of the companies with annual revenues greater than 20 million €, which has increased by 10 points from the 55.5% in 2007. Family businesses demonstrated to have, in addition to a great ability to stay and compete within the market, also higher growth rates

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[1] "To have and to hold", Adrian Wooldridge in The economist, 16th April 2015

than non-family companies. They also express high presence of family leaders, with the 73.2% of the Italian family-controlled companies run by a family CEO, and an important participation of family members, which on average account for the 52.5% of the components of the Executive Board.

1.1 Family firms

The family business topic for around 30 years has been increasingly considered as an independent field of study in economy, with an increasing number of academic journals related only to this argument such as the "Journal of Family Business Strategy", the "Family Business Review", the "Journal of Family Business Management", and several special issues published in other business journals, like the "Theories of Family Enterprise" in "Entrepreneurship Theory and Practice".

It is enough to think that since 1988, up to 1381 articles on this topic have been released (De Massis et al., 2021). The main focus of these articles is on the distinctions between family and non-family companies (Chua, Chrisman, Steier, & Rau, 2012), considering that the heterogeneity of the former is challenging for this goal (Melin & Nordqvist, 2007; Sharma, Chrisman, & Chua, 1997). In fact, it is demonstrated that the differences in the performances and in the behaviours between family organizations could be equal or also larger of those among family and non-family firms (Bennedsen, Perez-Gonzalez, & Wolfenzon, 2010; Chrisman & Patel, 2012). Hence, to properly understand the discrepancies among family companies, it is fundamental to identify the causes and the "why" of such differences (Chua, Chrisman, Steier, & Rau, 2012). According to Chua, Chrisman, Steier and Rau (2012), the possible reasons of this heterogeneity might be

substantially clustered according to *"the governance systems"* (Carney, 2005), *"the goals"* (Chrisman et al., 2012) and *"the resources"* (Habbershon, Williams, & MacMillan, 2003)". These elements could be influenced, respectively, by the composition of the Board of Directors, by the long-term orientation and by the location (local embeddedness).

In fact, for the governance structure the main difference could be identified in the composition of the Board of Directors (BoD), which can be made of both family and nonfamily members, is responsible of the succession plan and exercises control over the Top Management Team. The goals of family companies can be both financial and non-financial, and, like the objective to pass the business to the subsequent generations, they are usually affected by a long-term orientation (Le Breton-Miller & Miller, 2006), defined as a dominant logic who prioritize the long-range implications of decisions (Lumpkin et al., 2010). The resources available for a firm can be influenced by the territory in which it works; indeed, the local embeddedness, which characterizes the Italian Industrial Districts and origins from the involvement of economic actors in a geographically delimited network (Granovetter, 1973), can favour the access to both tangible and intangible assets.

1.2 Family businesses: Innovation and Tradition

In the extant literature the capability of family businesses to innovate has been discussed several times and different results have been proposed. According to the behavioural agency theory, there is a negative relationship between innovation and family firms (Block, 2012; Chen & Hsu, 2009; Chrisman & Patel, 2012), since family firms are less likely to take risky decisions, like investing in

R&D as it could weaken and reduce the family control on the company. While for the Resource Based View Theory, family businesses show higher ability in the conversion of innovation input into innovation output, because of their advantage in resource orchestration (Sirmon, Hitt, Ireland & Gilbert, 2011). Moreover, according to other studies, family businesses show a superior ability to innovate but a lower willingness to do so (Chrisman et al, 2015). Hence, despite the several investigations carried out, there are still some contradictions in the relation among family firms and innovation, this because family organizations are not homogenous, but shows conjointly endogenous characteristics that enhance and decrease both the ability and the willingness to innovate. One more point of ambiguity is constituted by the impact of tradition on innovation. In fact, past research considers it as a threat since it creates path-dependence, inflexibility, conservatism, inertia and core rigidity (Leonard-Barton, 1992; Sørensen and Stuart, 2000). However, some recent studies have proposed a positive effect of tradition on innovation, emphasizing the role of past knowledge as an opportunity to exploit (Messeni Petruzzelli and Savino, 2015; De Massis et al., 2016; Manfredi Latilla et al., 2019; Presenza et al., 2019).

1.3 Topics in our thesis

In this thesis we attempt to give an answer to the contradictions mentioned above. In fact, in order to tackle the following research question, *"What is the influence of a traditional and innovative context on the family firms ability and willingness to innovate?"*, we use a quantitative analysis based on a sample of small and medium family enterprises, located in Italy and belonging to innovative and traditional industrial sectors. First, we directly analyse the relationship of family

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ownership with both the ability and the willingness to innovate, emphasizing the role of the traditional context, then, to highlight the family firms' heterogeneity, the different BoD structures, the long-term orientation and the role of local embeddedness are analysed. Such research predicts that the traditional context smooths the ability-willingness paradox, in fact it confirms that family firms are more risk averse than non-family, but these companies do not demonstrate higher ability to convert the innovation resources used, as it was supposed to be, suggesting that also non-family firms are able to catch the opportunities of tradition. Moreover, as regards to family firms' heterogeneity, the most interesting results concern the local embeddedness and the family involvement. The former does not impact significantly on innovation, , the latter not only reduces the R&D investments, but also the ability to convert the innovation input, since the traditional context enhances the perceived control distance between family and non-family members, thus decreasing the exchange of knowledge.

This dissertation is organised as follows: in the next chapter a review of the literature related to family firms is provided. Then, in the third section, the gaps found in the extant literature are highlighted, with the formulation of the research question and the several hypotheses which our research aims to test. In the fourth chapter the methodology employed for the selection of the sample and the variables, and for the quantitative analysis is explained. While in the fifth part a descriptive analysis of the sample and the results of the analysis are referred. Such results are subsequently theoretically discussed in the sixth chapter, in which also the managerial implications of the outcomes are illustrated. The seventh section shows the limitations of the work and the suggestions for future research.

2. LITERATURE REVIEW

This chapter is composed by three main parts: the first section gives a clear definition of Family Businesses by explaining their heterogeneity through the 3 Circles Model, the importance of Socio-Emotional Wealth, the role of family management and their orientation to long term results. The second part provides a clear overview of the innovation theories in family businesses, pointing out the most relevant factors that impact on innovation processes (Duran et al., 2016). The third part is fully dedicated to the role of tradition in innovation processes: after clarifying the definition of tradition, it is shown how tradition can become a source of competitive advantage and its role in innovation processes. In particular, it is given great attention to the role of external and past knowledge, and to the peculiarities that favour or disadvantage family businesses in their aim of making such knowledge available within the company (Knowledge Internalization – Absorptive Capacity). We then deepen the concept of territory tradition and the related concept of local embeddedness represented by the industrial districts in the Italian scenario.

2.1 Introduction to family business

Family firms are characterized by a very high heterogeneity which makes it challenging to give a unique definition of them. At an initial level, family firms can be seen as entities interlinking two distinguished systems: one is the family system, defined as all those dimensions that deal with the social aspect of family,

and the other is the business system, which refers to all those dimensions related to economics.

These two systems are distinct strategic entities and the prevalence of one dimension over the other determines the heterogeneity among the family firms. In fact, there might be companies in which the family dimension is predominant. This is translated into a higher attention to the relationships among family members, to the maintenance of the family wealth or to the conservation of control within the family, rather than focusing on economic performances.

An evolution of this vision of family firms is given by the "Three Circles Model" (Tagiuri and Davis, 1982), in which both the managerial and the ownership dimensions are analysed. This model leads to a static view of family firms, due to the categorization of family businesses based on their position in the framework and their propensity to have a family, management or ownership approach.

However, the theoretical definition proposed by Chua et al. (1999) allows us to overcome this problem and understand the real essence of a family business:

> *"A business governed and/or managed with the intention to shape and pursue the vision of the business held by a dominant coalition controlled by members of the same family or a small number of families in a manner that is potentially sustainable across generations of the family or families".*

This definition clearly transmits the essence and the scope of a family business, defining a unique type of organization characterized by shared vision and a long-term orientation to make the business sustainable for the family and for the future generations. This definition includes and takes into account the

heterogeneity of family businesses, as it focuses on the real essence of them and not on specific behaviours or endogenous features.

The next sections helps to better understand the challenge of family firms heterogeneity and to better define the borders of such heterogeneity. In particular, family firms' behaviours are explained according to family goals, the relationship between Ownership and Management and the consequent long term orientation typical of family firms.

2.1.1 Goals and Socio-emotional Wealth

Family firms goals

Goal setting is a crucial process for the companies, since it makes possible to convert the individual goals of the members into corporate policies and activities (Cyert & March, 1963), in fact, according to the organizational approach, the companies don't have simple and unitary goals, but rather these are affected by the different coalitions formed within the organizations (Cyert & March, 1963; Stevenson, Pearce, & Porter, 1985). This important function of goal setting is very challenging for family firms, which present two interrelated systems, the business and the family (Habbershon, Williams, & MacMillan, 2003), so that this last one can exercise its influence to facilitate decisions aimed at achieving family-centered goals (Chua, Chrisman, & Sharma, 1999; Chrisman, Chua, Pearson, & Barnett, 2012). An important contribution to properly understand the mechanisms that lead to the establishment of goals in family firms is provided by Kotlar and De Massis (2013). First of all they highlight the diversity of goals within the family organizations, generated by the relationship between the family and the business system, and then, using the two dimensions of *"goal content"* and *"goal recipient"*, four individual goal categories are identified. The

first dimension refers to the nature of the goals, which can be economic or non-economic, while the other dimension relates to who the goals are aimed at, family or nonfamily. The first category of goals taken in consideration are the *"family-centered economic goals (FC-E)"*, which are pursued by the family to maintain the control of the company and to defend and create different kinds of wealth for the family members. Moreover the second category is always oriented to the family, but this time the reasons are non-economic, these are the *"family-centered noneconomic goals (FC-NE)"*, which include objectives like maintaining the harmony inside the family, safeguarding the connections among the family and the corporate identity and fostering the image and the reputation of the family. Differently, the third goals category is affected by the economic point of view and is not expressly aimed at the family, these are the *"nonfamily-centered economic goals (NFC-EC)"*, which aim to improve the economic and financial indicators and all the company performances in general. Finally, the last and fourth category of goals are the *"nonfamily-centered noneconomic goals (NFC-NE)"*, which are oriented to all the stakeholders except the family, both internal and external, and don't have an economic foundation. These include objectives like preserving and strengthening the ties with the staff and employees and also with the local communities. Furthermore, such diversity of goals between the various family members is influenced by different factors. In fact, it *"increases as the number and membership assortment of organizational members involved in the upper echelons of a family firm increases"* (Kotlar and De Massis, 2013), and is also influenced by the generational succession, which unsettles goal diversity and makes her more noticeable in those circumstances. At this point it is important to understand how family firms deal with this diversity and so in which way it's possible to arrive

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to family-centered goals. According to Kotlar and De Massis (2013), there are two possible steps that family firms follow; the first phase is the bargaining, which occurs when the family members interact each other through negotiations or disputes, while the second is the stabilization phase, which takes place sometimes and consists in the formalization of the goals resulting by the previous stage. These two steps between family members can show two different types of social interactions: *"professional and familial social interaction processes"* (Kotlar & De Massis, 2013). The professional interactions are more formal and standardized, take place only in the business context and require defined roles, on the contrary the familial interactions are informal, with undefined roles and occur also in the family environment. Therefore, the professional social interactions lead to the formulation of promises and threats in the bargaining phase, and a strong formal control is exercised in the stabilization stage.

On the other side, for the familial social interactions, manifestations of affect take place in the bargaining phase, while the stabilization occur through folkways, such commonly recognised forms of conduct, and mores, like moral codes of practice. These differences lead to different results, in fact, the professional social interactions generally leave unchanged, and sometimes could even worsen, the goals diversity, hence negatively influencing the collective commitment to family-centered goals. On the other hand, familial social interactions have better results in the stabilization of such goals. In fact, these favour the dispute settlement emphasizing the family interest, and lead to the strengthening of the members commitment to family-centered goals.

Non-financial goals and Socio-Emotional Wealth

One of the most important characteristics of family firms, which distinguishes them from non-family companies, is the particular attention to the achievement of non-financial goals, which are described as the ones that do not have a direct tangible monetary value (Zellweger, Nason, Nordqvist, & Brush, 2011). In the literature different examples of these goals have been presented, both at family and firm level. In the first case these goals encompass *"pride in the firm, family status in the community, entrepreneurial tradition, social support among friends, harmony among family members"* (Zellweger, Nason, Nordqvist, & Brush, 2011). While at firm level, nonfinancial goals comprise *"responsible employee practices, trusting relationships with suppliers and customers, environmental actions, corporate social performance and support for local community"* (Zellweger, Nason, Nordqvist, & Brush, 2011).

The importance of non-financial goals in family companies can be explained principally through the socio-emotional wealth theory (Berrone, Cruz, Gomez-Mejia, & Larraza Kintana, 2010), which, in a simple way, suggests that family companies aim to preserve their socioemotional wealth (SEW), defined as the nonfinancial aspects or *"affective endowments"* of family owners (Gomez-Mejia et al., 2007). This model was generated starting from the behavioural agency theory, previously developed by Wiseman and Gomez-Mejia (1998), which encompasses aspects of agency theory, prospect theory and behavioural theory of the firm (Berrone et al., 2012). According to the model, firms act following the decisions of their dominant principals, thus resulting into strategies that aim to preserve accumulated endowment in the companies, and, in the case of family principals, the emphasis on preserving SEW plays a crucial role, indeed family owners take

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their choices assessing how these would affect that endowment (Berrone et al., 2012). It is important to highlight that firms could face several risks giving preference to a decision that preserve SEW rather than to one that is based on stronger economic reasons. According to Gomez-Mejia and colleagues (2007), socioemotional endowment can be conceptualized as the affect-related value that originates from the family controlling role in a specific company and comprises *"the unrestricted exercise of personal authority vested in family members, the enjoyment of family influence over the business and the close identification with the firm, that usually carries the family's name"* (Berrone et al., 2012).

Different empirical examples have showed that family principals tend to choose riskier economic decisions that preserve SEW (Berrone et al., 2012). Gomez-Mejia et al. (2007) discussed the case of family-owned olive oil mills that are still independent and did not join cooperatives, despite these would allow to minimise the firm risk and get financial benefits. Moreover, Jones et al. (2008) pointed out that family-controlled companies mainly choose members of the board of directors who have business links with the firm, also if this reduces the board's capacity to control managers and give impartial recommendations. In addition, other studies have shown how SEW affect strategic decisions. For example, Gomez-Mejia et al. (2010) revealed that family firms diversify less than non-family ones, although this could cause a higher economic risk. This is due to the fact that diversification threatens family SEW, in fact it requires the designation of non-family members into responsibility positions, thus decreasing the family power of decision. Furthermore, Gomez-Mejia et al. (2011) corroborated such tendency during the analysis of the attitude of family-controlled enterprises, operating in high-tech industries, toward technological

diversification choices. Even in this paper this type of firms diversifies less, despite the risk reduction; indeed the tech diversification affects adversely the family's SEW, resulting usually in a transfer of shares to external entities like venture capital enterprises and institutional investors. Another important aspect of how SEW influences decisions is the one identified by Berrone et al. (2010), who showed that family firms pollute less with the aim of improving the family reputation, protecting in this way their SEW. This is especially true if factories are situated near a specific community and, it is relevant to highlight that they have such behaviours without any financial benefits.

There are five major dimensions of SEW identified by Berrone et al. (2012), shortly summarized as FIBER.

A. *Family control and influence*

The first one is related to the ability of the family to control and influence firms' strategic decisions. It is possible to have this authority through the nomination of a family CEO or with some family members in the Board of Directors, which can come from a single family or from a coalition of them. The fact that family members can have several positions within the company increases their formal and informal power (Mustakallio, Autio, & Zahra, 2002). There are also some subjective factors that influence this control, such as a personal charisma or a given status. Therefore, summarizing, to maintain SEW it is fundamental for a family to have a constant control over the company, even though this approach can lead to negative economic results (Gomez-Mejia et al., 2007).

B. *Family members' identification with the firm*

This second aspect deals with the strong identification of the family with the company. In fact, the combination of family and affairs leads to the development

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of a peculiar identity of the company, which usually bears the same name of the family, such that all the stakeholders perceive it as an extension of the family itself. This strong identification influences both internal and external characteristics of the firm. At the internal level it greatly affects the approach toward the employees, the processes and the quality of the output (Carrigan & Buckley, 2008). On the other hand, at the external level, for the family members the image that they give to the world outside becomes very important (Micelotta & Raynard, 2011). Therefore family-controlled companies pay a lot of attention to a good reputation, and so to corporate social responsibility (Berrone et al., 2010).

C. *Binding social ties*

The third dimension covers the relations of the family firms. According to Cruz et al. (2012), SEW leads to achieve the same shared benefits of closed network, like honest relationship and genuine solidarity. The social ties are not only present within the firm, but also outside, for example in the long-standing suppliers, who can be considered as part of the family (Uhlaner, 2006). This strong identity of the family companies, in which also non-family workers recognize themselves, generates a positive and prolific work environment. In addition, Berrone et al. (2010) sustain that family firms are strongly connected with their communities, and frequently give financial support to events and organizations that have an important meaning for the local people. They can act in this way for altruism, for the pleasure of having recognition for these actions (Schulze et al., 2003b) or for all the above.

D. *Emotional attachment*

The fourth dimension is related to the affective content of SEW and discusses the importance of the human feelings. In fact, since the family and the company are deeply linked together and a distinctive characteristic of family firms is right the combination of emotional elements coming from family engagement with business components, the emotions pervade the firms affecting the decision procedure (Baron, 2008). These emotions evolve over time through the events that distinguish the family business context and can have both positive and negative effects. An example of the first case is when, under specific circumstances, family members have the chance to be selfless (Schulze et al., 2003b) or when they trust each other (Cruz et al., 2010). Instead, an example of a negative consequence, is related to dysfunctional relationship. In fact, while in non-family firms this kind of conflicts ends with the cancellation of the employment contract, in the family, as a result of the strong emotional attachment, the relations are preserved in the hope that they will get back as before (Berrone et al., 2012).

E. *Renewal of family bonds to the firm through dynastic succession*

The last dimension recalls the intention to bequeath the firm to subsequent generations. In fact, according to Zellweger, Kellermanns, et al. (2011), transgenerational sustainability is a crucial element of SEW, which also influences the decision-making process. Indeed, preserving the company for future generations is generally considered as a critical objective for the family members in charge. From the point of view of a family owner, the firm represents the legacy and the tradition of the family, therefore it is very difficult to sell and represents a long-term investment to pass on to successors (Berrone et al., 2010).

Even though the long termism can lead to some negative implications, like managerial entrenchment and disputes over succession, it permits to create a *"generational investment strategy that creates patient capital"* (Sirmon & Hitt, 2003), thus generating a long-term competitive advantage.

2.1.2 Ownership and management

The relation between ownership and management is a crucial topic in the family firms' literature, indeed different theories have been developed in order to explore this important relation; in the next chapters two of them, the agency and the stewardship theory, widely used by different authors, are explained. They identify two different individual behaviours within the family firms and provide adequate systems of governance, in order to foster pro-organizational conduct and therefore enhance firm performance.

2.1.3 Agency theory

Agency theory presents the relationship between the principal and the agent, hence every relation between a principal and a manager, independently from the current position. It argues that as a result of asymmetric information and divergent interests, agency problems, like moral hazard and adverse selection, could occur (Eisenhardt, 1989; Jensen & Meckling, 1976). Moral hazard occurs after the signing of the contract, with the omission or commission of actions that are consistent with the interests of the agent but not with the ones of the principal. While adverse selection takes place ex-ante the contract, when a principal unknowingly contracts with an agent who is less skilled or has different interests compared to what assessed. In order to address such problems, solutions like search and verification costs for adverse selection and incentives and monitoring

activities for moral hazard, need to be implemented. All the costs derived from these mechanisms of control, with the ones due to the agents' opportunistic behaviours, take the name of agency costs (Chrisman, Chua & Litz, 2004).

Different authors (Becker, 1974; Jensen & Meckling, 1976; Parsons et al., 1986; Eisenhardt, 1989; Daily & Dollinger, 1992) suggest that family firms, thanks to their familiar altruism, should be excluded by agency problems. But family firms cannot be considered as a monolithic unique group, since they have different characteristics and interests (Sharma, Chrisman, & Chua, 1997), and so some companies could have such troubles. For example, in some papers the agency problems generated by asymmetric altruism are largely discussed (Schulze et al., 2001; Schulze et al., 2003a; 2003b; Moores, 2009). In fact, being altruism a behaviour from which others take advantage, it might harm the family-controlled company. The family leaders of a firm could be unwilling to control and monitor the other members of the family, who can exploit such situation by shirking or free riding, generating a moral hazard agency problem (Chua, Chrisman, Kellermanns, & Wu, 2011). Asymmetric altruism could also lead to adverse selection agency problems, which occur, for example, when the family firm prefers to hire family members rather than non-family, also paying them higher wages, even though the latter are more capable and skilled (Schulze et al., 2003b, Chua et al., 2009). Also problems between family and non-family shareholders, caused by the misalignment of the corresponding goals, can happen. In fact, the family could behave opportunistically in order to achieve non-financial goals, and this results in a reduction of the firm performance, thus generating conflicts between the owners (Villalonga & Amit, 2006).

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All these issues reduce the performance of the family firms and create agency costs. Consequently, the principals tend to establish a set of agency governance mechanisms in order to control and hinder such conduct, aligning in this way the different interests and so increasing the firm performance. In fact, family firms that apply agency governance measures, like the incentive compensation, the monitoring and the institution of a board of directors, have better results (Chrisman et al., 2007). For example, a board allows to have in charge both family and non-family members, with those outside who can monitor effectively the family, and this last one who can properly control the business (Anderson & Reeb, 2004). The Board of Directors makes possible to re-align the different interests, preventing inadequate management and family entrenchment (Eddleston et al., 2012), reducing the contrasts between family members and safeguarding their economic affairs (Bammens et al., 2008). When there is a non-family CEO, also the compensation practices improve the performance of family firms, providing him incentives in order to fit his interests with the ones of the owners (McConaughy, 2000). These incentives instead are provided to a lesser extent to a family CEO, since the family tries to reduce his personal risk (Gómez-Mejía, Larraza-Kintana, & Makri, 2003). So, summarizing, also in family firms some agency problems could exist, and mechanisms of governance need to be implemented to enhance the company performance. When goals between owners and managers differ, a Board of Directors probably will exist (Pieper et al., 2008), with a larger size and a high ratio of external member (Jaskiewicz & Klein, 2007). Differently, when the goals are aligned, a stewardship behaviour prevails, reducing the importance of monitoring systems (Pieper et al., 2008).

2.1.4 Stewardship Theory

Stewardship theory comes from social and psychological studies and, like agency theory, discusses the relationship among two characters, the principal and the steward-manager. It suggests a more humanistic vision, in contrast to the economic perspective of agency theory (Donaldson & Davis, 1991; Corbetta & Salvato, 2004b). Managers are characterized by a steward behaviour, with an intrinsic motivation and a deep desire to serve the company, that makes possible the matching of the interests of principals and managers (Corbetta & Salvato, 2004b; Hernandez, 2008; Zahra et al., 2008).

Different studies have analysed the relationship among stewardship theory and family firms. According to Davis et al. (2010) family firms provide an optimal environment for the development of commitment and trust between the workers, so much that stewardship is identified as "*the secret sauce*" of their competitive advantage. Such steward behaviour positively impacts the firm performance, in fact a high employee identification with family business leads to an increase of firm survival and returns (Vallejo, 2009). Moreover, it is demonstrated that behaviours oriented to serve the others help the growth and the results of family firms (Eddleston & Kellermanns, 2007). So, the steward behaviour could be available within the family business context, both in the family members, and in the non-family ones. But since it is influenced and enhanced by the leadership, Pearson and Marler (2010) claim that a crucial role, in its dissemination among the employees, is played by the stewardship decisions of family leaders.

In an organization where the steward behaviour prevails, the mechanisms of governance should not be oriented to the monitoring but should leave to the employees a high degree of discretion. Stewardship governance indeed

stimulates cooperation among employees and inspires them, promoting a pro-company behaviour which in turn increases performance (Davis et al., 1997; Eddleston & Kellermanns, 2007; McGregor, 1960). Respect to non-family firms, family businesses have higher stewardship governance, with an inclusive and flexible behaviour in which workers have greater autonomy (Miller et al., 2008). This type of governance is positively correlated with corporate entrepreneurship in family firm (Miller et al., 2008), since having a participative decision-making process favours the combination of the insights of both family and non-family members, enhancing entrepreneurial projects (Eddleston et al., 2012).

2.1.5 Long Termism

The concept of Long-Term Orientation, described as:

> *"the tendency to prioritize the long-range implications and impact of decisions and actions that come to fruition after an extended time period" (Lumpkin et al., 2010)*

is often associated to family firms. For example, Le Breton-Miller & Miller (2006) sustain that the goals and the identities of family firms present a long-term perspective. In fact, family-controlled companies aim to generate and protect wealth for the subsequent generations (Zellweger, 2007) and work to achieve several non-financial goals, like preserving and increasing the family name (Miller & Le Breton-Miller, 2005), reaching a peaceful and safe family succession (Handler, 1994), defending and developing the socio-emotional wealth (Gomez-Mejia et al., 2007) and producing transgenerational value (Zellweger, Nason, & Nordqvist, 2012), which are all objectives distinguished by a long-time horizon. Moreover, for what concern the identities, the environment characterised by a stewardship approach (Eddleston & Kellermanns, 2007) and the culture (Zahra

et al., 2004) of the family companies, are usually linked to a Long-Term Orientation. According to Lumpkin & Brighman (2011), the Long-Term Orientation is composed by three dimensions: the continuity, the futurity and the perseverance, which are described below,

A. Continuity

This first dimension "*consists of preservation, constancy, and durability*" (Lumpkin & Brighman, 2011) and is based on the opinion, that whatever that lasts for years, has a value. Continuity includes the influence of the elements of the past on the future and is interested in the role that long-term ambitions and concerns for the succession play on future decisions. In the family literature studies often refers to the objective to create a long-lasting firm, in order to guarantee to family members long-term benefits (Miller & Le Breton-Miller, 2005). It encompasses both continuity of the firm and of the family. In fact, family businesses do not pursuit only financial goals, but also the succession to subsequent generations, seeking to obtain continuity of ownership and control, thus giving a value to it. Continuity takes into account also the legacy of the founder, whose influence continues over time to affect the decision-making process of the subsequent generations.

B. Futurity

The second dimension "*is based on the belief that forecasting, planning, and evaluating the long-range consequences of current actions has utility*" (Lumpkin & Brighman, 2011). It argues that the organizations with high futurity consider future events as possible and real (Das & Teng, 1997), have a stronger attitude for the long-term planning and use tools like what-if analysis, forecasting, monitoring (Miller & Friesen, 1982). Moreover, futurity, considered as a shared strategic mental

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attitude, is stronger in family businesses rather than in non-family firms (Ensley & Pearson, 2005). In fact, family firms present high attention to succession planning in order to allow the firm to last over time and for the intentions of control of the generations, therefore tend to have greater future orientation (Sharma, Chrisman, & Chua, 2003; Chrisman et al., 2010).

C. *Perseverance*

Finally, the last dimension argues that the hard work of today creates a value in the future. Organizations with perseverance know that the cumulative effort, with the time and the patience, leads to value creation. Family firms are consistent with perseverance. In fact, show higher levels of perseverance and commitment coming from family pride and tradition (Brockhaus, 2004), which in turn lead to a stronger motivation to succeed (Kuratko, Hornsby, & Naffziger, 1997). Moreover, family businesses have as strong point the use of patient capital (Sirmon & Hitt, 2003), because are willing to continue over time in their investment decisions, creating in this way value with less risk (Zellweger, 2007).

It is important to highlight that LTO is not seen as a strategy or as a resource to leverage, but as a dominant logic, a mind-set that influence the strategic decision-making and the conceptualization of the business of the dominant coalition, intended as all the decision makers and managers that contribute to the building of the firm vision (Lumpkin & Brighman, 2011).

It is not possible to measure the LTO directly, so in literature several proxies have been used. For example, some measures such as the longevity and durability of family businesses, which present an implicit long-term element (Colli, 2012), have been applied. Moreover, in family firms, also the length of time considered for investment decisions (James, 1999; Le Breton-Miller & Miller, 2006) and the

expenses in R&D (Chrisman & Patel, 2012) have been employed as proxies of LTO. At the end, as possible measure, can be mentioned the Family Influence on Power, Experience, and Culture (F-PEC), which exploits some components linked to long-termism in order to evaluate the family and generational engagement (Astrachan, Klein, & Smyrnios, 2002).

2.2 Introduction to family firms' innovation theories

Once understood the main concepts that drive family businesses decisions and behaviours, it is possible to illustrate the main innovation behaviours of these organizations and the most relevant drivers. The heterogeneity of family firms has a strong impact also on innovation processes and deeply affects research. Indeed, according to the main driver analysed, there are several theories and studies that identify positive or negative relations between family businesses and innovation processes; a clear overview of the extant literature on this topic is given by the work of Calabro et al. (2018), in which 118 papers published between 1967 and 2017 are systematically reviewed.

Before analysing the different perspectives, it is worth mentioning that R&D expenses are different from other investments due to their time-consuming requirements, to the fact that R&D projects often fail and to very uncertain returns (Scherer, 1998; Scherer and Harhoff, 2000; James, 1999). Therefore, as *"Long-term investments are actual expenditures and resource allocations intended to realize these long-term goals"* (Le Breton-Miller & Miller, 2006), a long-term orientation and a risk-taking attitude are founding elements for R&D investment decisions.

In the next sections the mechanisms influencing innovation process are explained, to provide a full picture of innovation behaviours in family firms.

2.2.1 Agency perspective in family firms' innovation theories

When the problem is analysed from the agency theory perspective as in the article written by Joern H. Block (2012), two main consequences are relevant:

a. The person managing the firm and taking the decision of the R&D investment may have more information than the owners, leading to an "Asymmetric information" problem (Akerlof, 1970; Leland and Pyle, 1977; Myers and Majluf, 1984; Thakor, 1990) that may cause underinvestment (Joern H. Block, 2010).

b. Managers are more interested in short term performances and results; therefore managers may substitute R&D expenses with short term investments, creating the "Moral Hazard" problem that may cause either underinvestment or overinvestment in case of high dividends paid (Joern H. Block, 2010).

In addition, from an agency point of view, family firms are considered different to other organizations (Chrisman, Chua, & Litz, 2004), in fact owners have more power to monitor the managers, leading to a better alignment and a reduction of agency costs (Jensen and Meckling, 1976). This allows family firms to have more assets and resources available for long term investments (Le Breton-Miller & Miller, 2006). However, family firms are common to have several internal conflicts between the family members that increase agency costs (Dyer, 1994), and owners have the attitude to seek first personal goals and benefits rather than firm growth (Chandler, 1990; Claessens et al., 2002; Johnson et al., 2000; Morck and Yeung, 2003). This, together with the lower monitoring commitment of

families as owners compared to lone founders, lead to the conclusion that family businesses are negatively associated with R&D investment (Joern H. Block, 2010). Furthermore, the influence of non-economic family goals in family firms and the socio-emotional wealth (Gómez-Mejia et al., 2007), greatly affect the decision to undertake R&D investments. In particular, the behavioural agency model demonstrates the aversion of family firms to strategic decisions that lead to the loss of SEW (Berrone, Cruz, Gomez-Mejia, Larraza-Kintana, 2010; Chrismas & Patel (2012). Therefore, family firms can decide to take or avoid risky decisions regardless the increase of long-term economic wealth, but according to the impact of the decisions on SEW. For instance, Chen & Hsu (2009) proved evidence that family firms tend to invest less in R&D to protect their SEW.

This theory is opposed to the well-known long-term orientation of family businesses and their propensity to make long term investments (James, 1999; Le Breton-Miller & Miller, 2006).

In fact, Isabelle Le Breton-Miller & Danny Miller (2006) explain that there are specific conditions such as "*Concentrated ownership, lengthy tenures and profound business expertise*" that give some family businesses the resources to favour long term investment. In particular, they illustrate that "*there are some governance and leadership conditions that produce a long-term investment perspective within some family-controlled businesses*". For instance it is claimed that "*Investments in long-term projects and capabilities will be especially strong where family owners intend to involve subsequent generations of their family in the business*" (Le Breton-Miller & Miller, 2006). This is due to the fact that they are pushed to give the business to the future generations in good conditions. These investments allow family firms with those specific governance conditions to create such competitive

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asymmetries that are difficult to be replicated by other non-family companies (Miller, 2003).

These two apparently diverging results reinforce the greater heterogeneity of family firms (Chrisman & Patel, 2012). Thanks to the Myopic loss aversion framework, developed by Chrisman & Patel (2012), it is possible to better understand this behavioural variability in family firms, by taking into account the decision-making, the time horizon and the impact it has on investments.

In particular, it is stated that investment decisions and risk aversion behaviours are more likely when there is divergence of family and economic goals, leading to a risk aversion perspective and short-term family goals. Whereas, when family and economic goals converge, long term family goals gain more values and risky decision are more accepted (Chrisman & Patel, 2012). For instance, when transgenerational intention to transfer the family control of the firms to the next generation prevails, there is a better alignment of long-term family and economic goals, that can lead to undertake more risky decisions (Chrisman & Patel, 2012). This behaviour is due to the fact that decision makers are willing to accept a wider risk if they use the aggregation rule, that is to say, evaluating their investment over a longer time frame (Thaler et al., 1997).

Therefore, the most relevant conclusion that Chrisman & Patel (2012) achieve is that, when the aspirations and performance gap is negative, family firms increase R&D investments more than non-family firms.

2.2.2 Resource Based View perspective in family firms' innovation theories

Without going in details of the founding principles of the RBV Theory, this paragraph of the literature review focuses on providing a general view of the impact of a Resource Based logic, when applied to family firms, on innovation

behaviours, since possessing and managing resources is critical to innovation processes (Chirico, Sirmon, & Ireland, 2013).

Starting from the well-known principle that strategic resources are heterogeneously distributed across firms, also within the same industry, and that these resources have the ability to affect firm performances and create sustained competitive advantage (Barney, 1991), we analyse the role of the resource "Familiness" in innovation theories mainly relying on the work of Christina Matz Carnes & R. Duane Ireland (2013).

In particular, "Familiness" is defined as a unique resource to family firms (Chrisman, Chua, & Steier, 2005; Habbershon & Williams, 1999; Sirmon & Hitt, 2003), that try to capture the essence of family firms through the family involvement (Carrasco-Hernandez & Jimenez-Jimenez, 2012), or, more comprehensively, it can be seen as a synonym of family involvement, family influence and family control (Konig et al. 2013). Human capital, social capital, financial capital, and patient capital are examples of unique resources for family companies (Pearson, Carr, & Shaw, 2008; Sirmon & Hitt, 2003). Habbershon et al. (2003) define "Familiness" as the set of controlled resources coming from the overlap of the family and business system. However, it is not only the possession of resources, but their management that generate value-creating potential to be achieved (Chirico, Sirmon, & Ireland, 2013; Sirmon et al., 2007).

In this regards, Christina Matz Carnes (2013) explains that "Resource Bundling" is a relevant process for managers to manage resources effectively, since is related to the way resources are recombined and transformed to create capabilities, which strongly impacts innovation behaviours. This process is made of three main phases, Stabilizing, Enriching and Pioneering, each of them is analysed to

understand the effect of "Familiness" on that phase and how that impacts innovation processes.

The Stabilizing phase refers to those activities useful to keep and maintain the current strategy and capabilities (Sirmon et al., 2007), such as maintenance of physical resources, employees training or machine updates. A high "Familiness" level may often be associated to more rigid mental models (Konig et al., 2013) and to a stronger desire for continuity, which can be translated into the willingness to transfer ownership to the next generation (Miller, Le Breton-Miller, & Lester, 2010) or to keep wealth within the family (Gomez-Mejia et al., 2007). Therefore Carnes (2013) claims that "*Familiness positively influences the use of the stabilizing process within family firms*" and that "*Familiness enhance the use of the stabilizing process within a family firm, while increased use of this process in turn decreases innovation*", leading to a negative relationship with innovation.

Enriching, instead, works on extending and recombining current resources to create new knowledge beyond existing firms capabilities (Sirmon et al., 2007), such as the creation of new relationships. As already showed by the Agency perspective, governance and recombination costs are lower in family firms (Sirmon & Hitt, 2003), hence they can exploit benefits from the strong centralization of control and monitoring (Fama & Jensen, 1983). Furthermore, a high "Familiness" level favours the diffusion of tacit knowledge among family members (Sirmon & Hitt, 2003), making it easier to recombine resources and turn them into new capabilities. Therefore, Carnes (2013) claims that "*Familiness positively influences the use of the enriching process within family firms*". This gives family firms the advantage to better recognize recombination opportunities,

which leads to more innovations and extended capabilities (Christina Matz Carnes & R. Duane Ireland, 2013).

The last phase of the process refers to Pioneering, which refers to the developing or creation of totally new capabilities beyond the simply current capabilities extension, but through the integration and recombination of new resources in novel ways.

Regarding this, the rigid mental models (Konig et al., 2013), the reduced ability for new information to be spread and be accepted by family, the nepotism in hiring family managers (Webb, Ketchen, & Ireland, 2010) and the lower heterogeneity of managers, lead to the conclusion that "*Familiness negatively influences the use of the pioneering process within family firms*" (Christina Matz Carnes & R. Duane Ireland, 2013). Due to the positive correlation between pioneering and innovation, it is stated that "*the Familiness to innovation relationship is negatively mediated by pioneering in such a way that Familiness is negatively related to pioneering and pioneering is positively related to innovation*" (Christina Matz Carnes & R. Duane Ireland, 2013).

2.2.3 A synthesis of family firms innovation theories: "Doing more with less" (Duran et al., 2016)

Studies on family firm innovation have led to contradictory results so far, due to the heterogeneity of family firms. As seen above, there are some studies, based for instance on behavioural agency theory, that provide empirical evidence of negative association between innovation and family firms (Block, 2012; Chen & Hsu, 2009; Chrisman & Patel, 2012), while others, in particular those based on resource based theory, that highlight the resource orchestration advantages of family firms to better convert innovation input into output (Sirmon, Hitt, Ireland

& Gilbert, 2011; Christina Matz Carnes & R. Duane Ireland, 2013), but these studies do not manage to explain the lower innovation input. In this scenario, it is very helpful the contribution of Duran, Kammerlander, Van Essen & Zellweger (2016), which explain the complex paradox of innovation in family firms using a multi-theory approach.

First of all they remark the difference of innovation input and innovation output (Adams et al., 2006), where innovation input is described as the firm's financial investment dedicated to the exploitation and exploration of new path and opportunities. Innovation output is identified as the conversion of innovation input, and it is represented for instance by new patents or newly developed products (Schmiedeberg, 2008). While many authors assume a positive relationship between them (Dosi, 1982), Duran et al.(2016) believe that it depends on specific factors, due to the complexity of the innovation management (Klein & Sorra, 1996; Yayavaran & Chen, 2015). In particular, the relationship can be strongly influenced by the resource orchestration, as massive investments do not always lead to huge results, if the conversion is not well managed (Gilbert 2005). Differently, innovation input can be influenced by many different factors, such as firm physiological features and firm's network (Chesbrough, 2003).

However, to understand the factors that influence innovation in family firms, it is necessary to identify the main aspects that differentiate family organizations to non-family ones. These differences, called idiosyncrasies of family firms, are:

- *Control over the firms:* described basically as the voting rights, it has the power to affect both the monitoring and the influencing process in the organization (Carney 2005).

- *Wealth concentration:* described as the shares of family firms owners' wealth, it can change the sensitivity to uncertain investments (Anderson et al., 2003; Gomez-Mejia et al, 2007).

- *Non Financial Goals:* described as the attention not only to financial but also to non-financial goals (Duran et al., 2016)

The outcomes of the study developed by Duran et al. (2016), are based on the above-mentioned idiosyncrasies and they focus first on the relationship with innovation input.

Typically, family firm owners' wealth is concentrated in few businesses (Anderson et al., 2003), therefore they have a much higher investment sensitivity, and they strongly prefer to invest in less uncertain assets (Anderson et al., 2012), such as buildings or production machines, which guarantee more stability compared to innovation projects (Miller et al., 2011).

In addition, the socio emotional endowment and the strong non-financial goal to maintain the same level of control over the firm strongly affects and limits the investments in innovation for family firms (Gómez-Mejía et al., 2014).

Another relevant aspect is the well-known unwillingness of family firms to raise their debt level and to raise money from external financial resources (Mishra & McConaughy, 1999), since this would give external investors more control of the firm.

Despite the long-term orientation of family firms leads them to make long term investment, the above-mentioned reasons prevail on that. Hence, *"Family firms have lower innovation input than non-family firms"* (Duran et al., 2016).

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After that, the focus switches to the relationship with innovation output. One of the main aspects that favours the conversion of innovation input into innovation output is the superior ability of family owners to monitor managers (Uhlaner, 2013) and consequently innovation processes (Fama & Jensen, 1983). This comes from the high level of control deployed by family owners, their wealth concentration, and their unwillingness to dispense control.

As well as this, the aversion to leverage on external sources of money incentives family businesses to a more efficient conversion of innovation input into output (Carney, 2005).

In addition, family firms' attention to non-financial goals, such as control stability and maintenance of long term and trust-based relationships with stakeholders (Berrone et al., 2012), facilitates the development of a firm-level network and a firm-internal human capital that favour innovation input conversion. In particular, the creation of long-term relationship with suppliers (Berrone et al., 2012) and loyal customers (Miller & Le Breton-Miller, 2005), makes family firms particularly suitable to receive relevant support from their network players (Phelps, 2010). This "Privileged network access" (Duran et al. 2016) provides family firms access to knowledge and resources that cannot be immediately found on the market (Rothamaermel & Hess, 2007), improving their conversion ability. Regarding the human capital, it is the community of family firm employees, called Pseudo-Family (König et al., 2013), that favors the interaction and the accumulation of implicit or tacit knowledge (Almeida, Song & Grant, 2002). A high level of tacit knowledge among employees can promote the resource orchestration, favouring the innovation input conversion (Sirmon & Hitt, 2003).

According to all these reasons, "*Family firms have higher innovation output than non-family firms*" (Duran et al. 2016).

Another area of analysis in the "Doing more with less" article, is the impact of the family CEO on innovation processes. This role is extremely relevant as it can both influence the resource allocation processes and provide guidelines, shape processes, create routines that affect the resource orchestration and knowledge management (Crossan, Lane & White, 1999). The personal wealth concentration of the CEO in the firms, the control of ownership rights and the aim to maintain ownership control within the family (Chrisman, Chua, & Litz, 2004) strongly dissuade the family CEO from innovation investments. Therefore, "*Family firms with a family CEO have even lower innovation input than those without a family CEO*" (Duran et al., 2016).

On the contrary, the presence of a family CEO leads to an even higher innovation output (Duran et al. 2016) due to the fact that a family CEO is strongly motivated to monitor innovation activities and guarantee an efficient conversion of the resources engaged. In addition, a family CEO owns superior tacit knowledge (Polanyi, 1973; Nonaka & Takeuchi, 1995) regarding both internal processes and external stakeholders and networks, that can be used and directly applied to better orchestrate resources and to grant a superior conversion of innovation inputs.

The study compares also the different impact of a founder CEO to a later generation family CEO. In particular it is shown that "*Family firms with a founder CEO have higher innovation input than those without a founder CEO*" (Duran et al., 2016). The explanation to this behaviour consists on the fact that founders are less sensitive to uncertain and risky investments as they already carried out

entrepreneurial activities, which are risky by nature (Caliendo, Fossen, & Kritikos, 2009). In addition, contrary to a family member whose goal is to maintain control and wealth, the founder CEO is strongly motivated to the desire for firm growth (Miller et al., 2011).

This meta-analysis closes the scenario of innovation processes in family firms. In the next section the role of tradition is analysed both individually and applied to innovation processes.

2.3 Tradition in the family firms' innovation processes

Past literature had always considered tradition as a threat for innovation, as relying on past knowledge could lead to path-dependence, inflexibility, conservatism, inertia and core rigidity (Leonard-Barton, 1992; Sørensen and Stuart, 2000), which reduce the value and effectiveness of innovation efforts. However, recent studies support the role of tradition and past knowledge as a key opportunity to successfully innovate (Messeni Petruzzelli & Savino, 2015; De Massis et al., 2016; Manfredi Latilla et al., 2019; Presenza et al., 2019). Before going through the mechanisms that motivate the importance of tradition in innovation processes, it is necessary to delineate the concept of tradition.

2.3.1 Definition of tradition

There are many different evolutions of the definition of tradition, according to the context. The simplest way to conceptualize it is as *"Something transmitted – handed down or handed on – as well as the process of that transmission"* (Feldman, 2007; Shils, 1981). In this perspective, tradition must be seen not only as the set of "historical" elements transmitted through time but also as the way to reinterpret and adapt those elements of the past into the future (Shils, 1981; Hibbert &

Huxham 2011). In fact, an evolution of the concept explains that tradition does not limit to theoretical informed knowledge (Warnke, 2004; Hibbert & Huxham 2011), but it is expanded to *the marriage between factual elements and values, bound together in thick concepts*" (Warnke, 2004; Hibbert & Huxham 2011). Therefore, the development, the acceptance and the transmission of knowledge through time and across communities are part of the concept of tradition (Hibbert & Huxham, 2011).

Consequential studies better describe what are the components conveyed in firms through tradition. According to Hibbert and Huxham (2011):

> *"Tradition involves accumulation of know-how, symbolic and cultural content and micro-institutions of practice handed down across generations and contributing to shaping the identity of individuals, organizations and territories"*.

In addition, De Massis et al. (2016) refer to tradition as:

> *"The stock of temporal knowledge, competencies, materials, manufacturing processes, signs, values and beliefs pertaining to the past"*.

The definitions provided highlight the strong relationship between tradition and knowledge, which represents one of the main components of tradition.

2.3.2 Tradition as a driver for competitive advantage

According to this, studies claim that tradition, integrating knowledge from the past in new products, can *"elicit strong and positive feeling and can facilitate the legitimacy of innovative functionalities, increasing the probability to obtain market acceptance"* (Wang & Wallendorf, 2006; Ryder, 2014). Also the Resource Based View theory explains that *"tradition can represent a distinctive and unique resource of the firm, whose sticky and embedded nature make it difficult for other companies to imitate"* (Barney 1991; Kanter, 1995). This obstacle in replication allows the firm

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to develop an innovation with a higher level of uniqueness (Kanter, 1995). For these reasons, *"past knowledge is increasingly recognized as a powerful and unique source on innovation advantage"* (Messeni Petruzzelli et al., 2012) and *"tradition can be exploited to achieve innovation"* (De Massis et al., 2016)

The mechanisms that favour firms to unleash the potential of tradition in innovation processes strongly depend on firms' knowledge interiorization and reinterpretation capabilities (Keen and Tan, 2007). This means that innovation advantages rely on the ability to access, use, interiorize, reinterpret and transfer temporally distant knowledge (Gurteen, 1998; Swan et al., 1999). These capabilities can be enhanced by many factors, detailed in studies regarding Knowledge Internalization or Absorptive Capacity. For instance, family ownership, which is usually related to long-lasting relationship with external partners (Magistretti et al., 2019) and stronger ties with past sources of knowledge (Capaldo, 2007; De Massis et al., 2016), might have a positive relationship with knowledge related capabilities.

2.3.3 Mechanisms to enhance the role of past knowledge: Absorptive Capacity

In this regard, a clear explanation of the mechanisms through which family ownership affects Absorptive Capacity (AC), defined as the capacity to acquire, assimilate, transform, and exploit external knowledge (Cohen and Levinthal, 1990), is provided by the work of Kotlar, De Massis, Frattini, and Kammerlander (2020).

The mechanisms described are rooted on the distinction between Potential AC and Realized AC (Zahra and George, 2002). Potential AC refers to those knowledge stages that regulate the external information access into the firm's boundaries, namely: Knowledge acquisition and Knowledge assimilation (Lane

and Lubatkin, 1998; Van den Bosch, Volberda, and De Boer, 1999). Realized AC instead refers to the transformation of the previously externally acquired knowledge into valuable outputs, namely: Knowledge transformation and Knowledge exploitation (Narasimhan, Rajiv and Dutta, 2006; Tsai, 2001).

In addition, family owners influence, which can be seen as a wide concept, is reconceptualize according to 2 main structures: Emotional Attachment and Power Concentration (Kotlar et al. 2020).

Emotional Attachment, defined as the value of social and affective relationship between the business and family owners (Kotlar et al. 2020), is expected to influence the strategic goals formulation, by mixing rational and emotional elements (Kotlar, De Massis, 2013). According to the theoretical model developed by Kotlar et al. (2020), *"Emotional attachment of family owners decreases the level of potential AC"*. This is due to the fact that when emotional attachment is high, family owners tend to overvalue the actual internal knowledge base and reduce the value of external knowledge (König et al., 2013), hence reducing the willingness to explore external sources of knowledge (Pierce et al., 2001). By contrast, "*Increasing emotional attachment of family owners increases the level of realized AC"* (Kotlar et al. 2020), since once external knowledge is available, family owners tend to integrate that external knowledge into their self-domain (Ciarrochi and Forgas, 2000). This, not only reduces family owners' reluctance to external knowledge, but also encourages its use to transform existing products, services or processes (Benner and Tushman, 2002; Levinthal and March, 1993; Lewin et al., 2011).

On the other hand, power concentration, defined as how much decision-making is concentrated in the hands of family owners (Kotlar et al. 2020), can increase or

decrease the perceived power distance between family owners and non-family members (Patel and Cooper, 2014) and directly affects the hierarchical structure and social relationships. When applied to potential AC, the model explains that power concentration increases the level of potential AC (Kotlar et al. 2020). According to the fact that formalization and structure obstruct openness, and that family owners are not constrained by bureaucracy and structures, power concentration in the hands of family owners can reduce formalization, increasing the speed and intensity to gather new knowledge; this facilitates the firm's potential AC (Cohen and Levinthal, 1990; Todorova and Durisin, 2007; Zahra and George, 2002). Differently, power concentration decreases the level of realized AC (Kotlar et al. 2020), because realized AC is usually supported by hierarchical lower-level members (Lenox and King, 2004; Zahra and George, 2002) and a high-power concentration in the hands of family owners increases the disparity perception between family and non-family members, which are therefore less motivated to contribute to new knowledge exploitation (Harrison and Klein, 2007).

These results show that family ownership can have both a positive and a negative effect on potential and realized AC, hence the combination of the positive or negative effects associated to emotional attachment or power concentration can lead to exceptional high or low level of potential or realized AC (Kotlar et al. 2020). Therefore, family firms with high level of family ownership are expected to show high heterogeneity in AC (Kotlar et al. 2020).

For these reasons, the theoretical model goes more in details explaining how contingency factors related to family owners' emotional attachment and power

concentration incentive or discourage AC. To do so, the model introduces the concept of motivation gap, where:

> *"A motivation gap occurs when the firm's higher ability to acquire and assimilate external knowledge is counterbalanced by its lower willingness to do so, and the size of the gap depends on contingencies that relate to the family owners' emotional attachment" (Kotlar et al 2020)*

and implementation gap, where:

> *"An implementation gap occurs when the firm's higher willingness to transform and exploit external knowledge is counterbalanced by the firm's lower ability to do so, and the size of the gap depends primarily on contingencies that relate to family owners' power concentration" (Kotlar et al. 2020).*

A growth of motivation gap results in an increased negative effect of family ownership on potential AC, and viceversa (Kotlar et al. 2020).

The contingency factors that increase the motivation gap, reducing the level of potential AC, are: *"family owners strongly identification with the firm and family owners strong family control intentions"* (Kotlar et al. 2020). On the other hand, the contingency factors that decrease the motivation gap, increasing the level of potential AC, are: the firm negative performance feedbacks and the firm control threats (Kotlar et al. 2020).

Differently, a growth of implementation gap translates into a higher negative effect of family ownership on realized AC, and viceversa (Kotlar et al. 2020). The factors that boost the implementation gap, reducing the level of realized AC, are: a family CEO and family members involved in top management (Kotlar et al. 2020). Differently, those that weaken the implementation gap, increasing the level of realized AC, are: high family ownership dispersion and institutional investments (Kotlar et al. 2020).

As well as contingency factors, also temporal influence in AC is described by the model (Kotlar et al. 2020). Since the duration of family ownership is related to the duration of family owners' firm control (Zellweger, Kellermanns, Chrisman, and Chua, 2012), an increase to the psychological attachment to existing knowledge is expected. Therefore, duration in family ownership results in a declining of potential AC, and a rise of realized AC (Kotlar et al. 2020). This trend is completely disrupted when ownership succession happens (Kotlar et al. 2020), as decision-making processes become more centralized around the new owners. To sum up all the concepts explained so far, the visual framework of the model developed by Josip Kotlar, Alfredo De Massis, Federico Frattini, and Nadine Kammerlander (2020) is proposed:
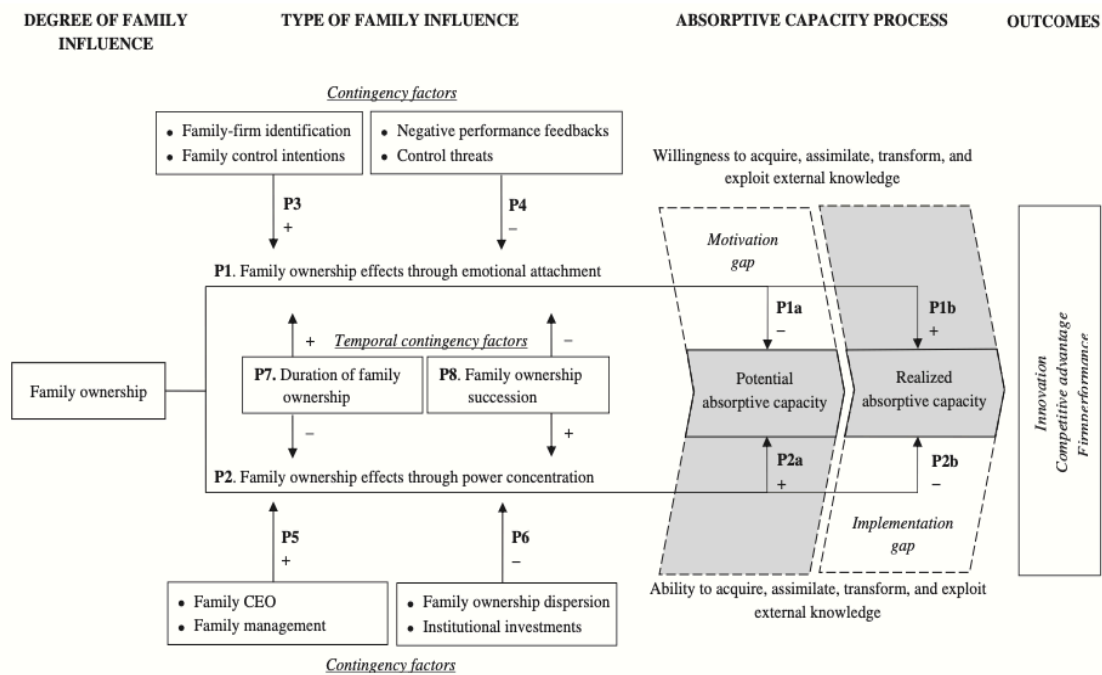
Figure 1 - Absorptive Capacity Framework (Kotlar et al., 2020)

2.3.4 Mechanisms to enhance the role of past knowledge: Knowledge internalization

To better understand the role of knowledge internalization we rely mainly on the work of Francesco Chirico and Carlo Salvato (2014), which analyse the impact of the internalization of knowledge, among family members, on product development (PD). Chirico and Salvato (2014) show that PD, defined as the firm's ability to create and modify products (Zahra & Covin, 1995), is positively correlated with knowledge internalization. This last one represents the *"team members' ability to recognize, assimilate, and exploit each other's specialized knowledge collectively"* (Chirico & Salvato, 2014). Knowledge recognition is the ability to properly detect and determine the others' knowledge (Cohen & Levinthal, 1990; Tiwana & McLean, 2005), knowledge assimilation refers to the capacity to understand the knowledge of every colleague and to combine these each other (Cohen & Levinthal, 1990; Tiwana & McLean, 2005), while knowledge exploitation relates to the ability to utilize their knowledge collectively in order to favour PD (Cohen & Levinthal, 1990; Tiwana & McLean, 2005; Van den Bosch et al., 1999). So, the knowledge internalization is something more than a dissemination of knowledge among family firm members, in fact it implies a joint ability to assimilate the others specialized knowledge and to employ it collectively (Nonaka, 1994; Kale & Singh, 2007). Moreover, Chirico and Salvato (2014) demonstrated that the family social capital, affective commitment and relationship conflicts influence the internalization of knowledge, and in turn the PD. Indeed, *the social capital*, which is the level of trust and proximity between the components of an organization (Nahapiet & Ghoshal, 1998), presents a positive effect on PD, since the strong social relationship, the reciprocal confidence and

the long time spent together of family members enhance the internalization. *Family affect commitment* has a positive effect on PD, both through the mediation of the internalization and through a direct effect. In fact, the family commitment positively affects the willingness of the individuals to contribute to the knowledge internalization, without obstructing it, therefore facilitating the intentional and collective use of family members' personal knowledge (Chirico & Salvato, 2008; Chirico, Sirmon, Sciascia, & Mazzola, 2011; Salvato & Melin, 2008). Ultimately, the *family relationship conflicts* instead have a negative effect on the ability to internalize knowledge and in turn on PD, since disputes reduce the capacity to assess and accept others' ideas (Jehn and Bendersky, 2003). As last thing, also the moderating role of the family generation in control, intended as the generation that actually manages the company (Cruz & Nordqvist, 2012), influences the ability of knowledge internalization (Chirico & Salvato, 2014). In fact, the different generations present different entrepreneurial behaviours, due to the distinct models of interpersonal relationship (Gersick, Davis, Hampton, & Lansberg, 1997), and so show different capacities of knowledge internalization. Later family generations in control indeed enhance the positive influence of social capital on the internalization of knowledge, and, at the same time, reduce the negative effect of relationship conflicts, while they don't have relevant effects on the influence of the family affective commitment (Chirico & Salvato, 2014).

2.3.5 Tradition in family business: "Innovation Through Tradition"

According to the mechanism described above, family businesses can have unique features and special capabilities to create links with the past, present and future (Zellweger, Nason, & Nordqvist, 2012) and to make the past available and

comprehensible to the employees involved in innovation processes, through special routines that guarantee continuity over time (Shils, 1981) and preserving the original content of past knowledge (Hibbert & Huxham, 2011). For example, there are specific industries such as health, food, beverage and luxury, in which using past knowledge to innovate can be extremely effective, as customers' needs are more likely to be satisfied only leveraging on preservation and adaptation while innovating (Hargadon & Douglas, 2001).

However recent literature is analysing the way through which firms can search and properly use tradition and past knowledge to innovate (De Massis et al., 2016). This research stream, which requires the combination of a multitude of theoretical perspectives, leads to the realization of specific frameworks that explain how specific firms can innovate by leveraging on tradition.

For example, a very interesting model that shows how firms can develop new products exploiting knowledge from the past is presented in "Innovation Through Tradition" (De Massis et al, 2016). The model, which relies on two dynamic capabilities, knowledge interiorization and knowledge reinterpretation, indicates the phases of the process. The first phase is the "Identification of resources", in which the firm recognizes and collects the sources of past knowledge through temporal search activities (De Massis et al, 2016). The sources of knowledge are firm tradition and territory tradition (De Massis et al, 2016). Immediately after, raw past knowledge is elaborated and refined in the interiorization phase (De Massis et al, 2016). This can result in Codified Knowledge, like raw materials and manufacturing processes or Tacit Knowledge, like basic assumptions and beliefs (De Massis et al, 2016). These types of knowledge, together with the novel knowledge or new technologies,

represent the inputs for the reinterpretation process, which leads to the development of new functionalities or new meanings (De Massis et al, 2016). The framework developed by De Massis et al. (2016) is proposed below.
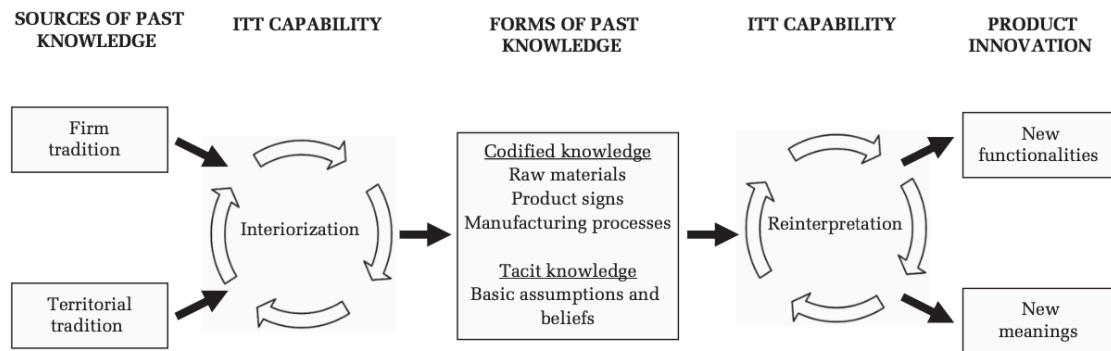
Figure 2 2 - Innovation Through Tradition model (De Massis et al., 2016)

This is just an example of a model proposed by this research stream. Many other studies provide behavioural guidelines and models to exploit tradition for innovation practices, always through qualitative and case-based methodologies. For instance, other important contributions are given by Magistretti et al. (2020), Erdogan et al. (2020), Della Corte et al. (2018).

2.3.6 Industrial districts

As in the previous chapter the role of territory tradition has been introduced, we provide an overview of the most meaningful examples of territory tradition: the Italian industrial districts.

The father of industrial districts concept can be considered Alfred Marshall in his Principles of Economics (1890). In his studies about the industrial organization, he highlights two types of associations capable of exploiting the benefits of the division of labour: on the one hand the large integrated company operating on a large scale, on the other hand the industrial districts, intended as the concentration in the same location of many specialized firms. To explain how

firms benefit from the division of work, he introduces the concept of external economies. These localized external economies are usable indistinctly by all the subjects who are part of the district and allow the companies to reach high levels of efficiency, enhancing the division of work and the exchange of information between companies. These localized external economies include advantages such as the presence of a large and stable pool of skilled workers, the low access to production services costs, the possibility to use immediately and easily sophisticated machineries and common organizational methods. The concept of industrial district was formed in Italy by the economist Giacomo Becattini, who defines the industrial district as: "*A socio-territorial entity characterized by active coexistence, in a circumscribed area, naturalistically and historically determined, of an open community of people and of a segmented population of industrial enterprises*" (Becattini, 1989). The firms belonging to the industrial district share a common cultural heritage and are characterized by a complex and inextricable network of relations and conjunctions that surrounds both professional and informal relationship, facilitating the dissemination of knowledge among the actors (Becattini, 1987). This socio-cultural homogeneity of the industrial districts' context that Becattini highlights is summarized by Dei Ottati (2003) in the concept of "community market": a shared language and values, customs and implicit rules of behaviour common to all the companies belonging to them.

According to Camuffo and Cardinetti (2011), the fundamental features of an industrial district (ID) are a specific territory, a peculiar product specialization and a group of firms. Moreover, what really distinguishes them, is the fact that the industrial districts' production process is not vertically integrated into each local company, but it is realized through the division of labour between the

companies of the district, interlinked in the supply chain. Therefore, in an industrial district, the product specialization that distinguishes the specific territory in terms of finished products (shoes, chairs, glasses or tiles in ceramics for example), includes also a broad range of phase specializations, corresponding to the different stages of the production chain assigned to each firm. In conclusion, what characterizes the industrial districts are the different specializations and the relationships, based on this diversity, of the local businesses. In addition, it is important to highlight that the networks of relations of the districts are not composed only by businesses, but also by various types of institutional actors such as *"municipal or provincial administrations, business associations and trade unions, banks, schools and chambers of commerce"* (Camuffo & Cardinetti, 2011). Therefore, industrial districts can be considered as *"local systems of innovation"*, in fact they are characterized by a high density of individual business contexts where knowledge is produced, and by an equally high density of internal channels in which this knowledge is transferred. Among the mechanisms that allow the intercompany transfer of knowledge, the more frequent are the observation aimed at imitation, the various types of relationships that exist within the district context and the mobility of the workers from business to business (Camuffo & Cardinetti, 2011).

2.3.7 Local embeddedness

The concept of embeddedness was introduced by Karl Polanyi (1944) in his book "The great transformation" and then further developed and influenced by Mark Granovetter. He suggests (Granovetter, 1973) that economic activities can be correctly understood only if the involvement of business organizations in the social structures and interpersonal relationships is taken into consideration.

According to the main dimension in the creation of these social structures (Grabher, 1993) different forms of embeddedness have been presented. In particular, the relation between location and business activity can be explained using the notion of local embeddedness, described as "*the involvement of economic actors in a geographically delimited network and/or institutional setting*" (Granovetter, 1973; Hess, 2004).

The implications of local embeddedness vary according to the territories, in fact not all the geographical regions present the same context, they differ in term of economic and technological development, connections and culture. Specific areas, such as the Italian industrial districts, are characterized by a strong local embeddedness. This type of embeddedness is relevant for business growth, since it favours the creation of the conditions that support productivity, innovation and competitiveness (Jacobs, 1969; Thompson, 1965). In fact, promotes deeper relations with customers, suppliers and local institutions (Cooke, 2007), facilitating therefore growth strategies in international markets and so the international competitiveness of the firms (Al-Laham & Souitaris, 2008). Moreover, the Local embeddedness simplifies the access to the assets, both tangibles, like skilled workers, new technologies and scientific competencies, and intangibles, like access to innovative ideas, formal and informal relationship and localized knowledge (Baù, Chirico, Pittino, Backman & Klaesson, 2019). Localized knowledge, in particular, plays a crucial role in the creation of a firm competitive advantage, in fact being tacit, it is very difficult to identify, transfer and replicate (Grant, 1991, Spender, 1993). But not all the companies are able to gain advantages from this resource in the same measure, indeed only the ones that are able to assimilate, utilize and exchange it can obtain all the benefits; this

capacity mainly depends by the firm's pre-existing knowledge, organizational processes, and strategies (Cohen & Levinthal, 1990).

A special relationship exists between family firms and local embeddedness, indeed according to Bird and Wennberg (2014), the family businesses are characterized by higher embeddedness with the regional community respect to non-family companies. In fact, family firm owners are significantly concerned to the longevity of the company, and so pay special attention to having long-term relationship with the local stakeholders, both directly engaging the employees in the creation of united local communities (Pittino, Visintin, Sternad & Lenger, 2016) and by establishing ties with external actors (Arregle et al., 2007).

Furthermore, this higher embeddedness can be also explained by the non-economic goals of family firms (Chrisman et al., 2012), since they aim at enhancing the company's spirit of community, at supporting the economic and social development of the region in which are situated and at the preservation and reinforcement of the relations with the local stakeholders (Berrone et al., 2012; Deephouse & Jaskiewicz, 2013). While, on the other side, non-family enterprises prioritize economic and market-oriented goals.

3. RESEARCH GAP AND HYPOTHESIS DEVELOPMENT

The goal and the research question of this study is described and explained in this chapter. First, the main insights described in the academic literature that led to the identification of the research question is summarized, then the aim of this dissertation is explained thanks to the outlined research question.

3.1 Research Gap

Within the boundaries of family business field, theories regarding innovation behaviours have led to fragmented and contradictory results so far. On the one hand, some research demonstrate the negative relationship between family businesses and innovation processes. For instance, J. Block (2010) proved evidence that family firms are negatively associated with R&D investments due to higher agency costs caused by stronger internal conflicts between family members and a reduced monitoring commitment if compared to lone founders. The same relationship is demonstrated by Chen & Hsu (2009), whose research takes into account a specific sample of Taiwanese companies and by Gómez-Mejía et al. (2014) with the corroborated principles regarding the impact of socio-emotional wealth on decision making. According to them, since family owners tend to avoid any risky decision that could undermine the wealth of the family and reduce the control on the company, family companies are less willing to invest in R&D and allocate less resources to R&D investments if compared to non-family companies.

On the other hand, family firms are expected to be positively related to innovation due to their long-term orientation. The definition itself of family business given by Chua et al. (1999) claims *"The family business is a business governed and/or managed with the intention to shape and pursue the vision of the business held by a dominant coalition controlled by members of the same family or a small number of families in a manner that is potentially sustainable across generations of the family or families"*. The vision and the sustainability across generation concept refers to the aim to achieve a better future for the dominant coalition, through the firm, which requires the maintenance of the control power. This implies a strong long-term orientation of family firms, hence family companies are supposed to be positively related to R&D investments since these increase the economic value of the firm in the long term. In addition, many research based on Resource Based View Theory highlight the superiority of family businesses in the ability to convert innovation input, due to their resource orchestration advantage (Sirmon, Hitt, Ireland & Gilbert, 2011).

The cause of these contradictions can be associated to the great heterogeneity of family firms which, according to complex mechanisms, can show both positive and negative relationships with innovation. For these reasons further investigations tried to identify the specific behaviours that drive family businesses decisions, through a multi-theory approach. In this regard an important contribution is given by Le Breton-Miller & Miller (2006) who outlined that there are specific conditions such as *"Concentrated ownership, lengthy tenures and profound business expertise"* that give some family businesses the resources to favour long term investment. For instance, when *"family owners intend to involve subsequent generations of their family in the business, Investment in long-term projects*

and capabilities will be especially strong" (Le Breton-Miller & Miller, 2006). Also Chrisman & Patel (2012), thanks to the Myopic loss aversion framework, try to explain family business behavioural variability taking into account the decision-making, the time horizon and the impact it has on investments. It is described that a divergence of economic and family goals leads to risk aversion behaviours, while in case of convergence, long term family goals are more accepted, as owners are able to evaluate the investment over a longer timeframe (Thaler et al., 1997). This means that family goals tend to lower R&D investments in family firms, however they increase noticeably R&D investments when the economic goals of the company are not reached (Chrisman & Patel, 2012). Kotlar et al. (2014) deeper analysed the behavioural heterogeneity caused by the relationship between economic and family goals, by investigating external and internal conditions that influence the risk-taking attitude of family firms, hence identifying drivers of R&D investment decisions of family businesses, such as family management, slack resources or supplier bargaining power. In particular, it is shown that the firm risk aversion changes accordingly to the variation of performance results (Kotlar et al., 2014).

All these different perspectives highlight the high complexity of this stream of research and stress the need to deeper analyse innovation behaviours by distinguishing between the different phases and processes of innovation. In fact, innovation has often been studied as a unique dimension, however, recent literature outcomes identify two main macro categories to classify innovation processes. These two categories are: innovation investments, which refers to all those processes that lead to the allocation of resources for innovation activities, and conversion of innovation input, which refers to the ability of the firm to

convert the innovation resources allocated. Hence, the contradictory results for innovation in family firms can be interpreted as the superior ability of family businesses to innovate and the lower willingness for family firms to do so (Chrisman et al, 2015). This paradox opens further research regarding the governance or ownerships implications that can modify these typical conditions of family firms.

To disentangle the contradictions in family businesses innovation literature through this recent perspective, an important contribution is given by Duran et al. (2016). In this research, through a meta-analysis on 108 primary studies, it is proved evidence that Family firms invest less resources in R&D, but they better convert innovation input into output. This effect is emphasized when the CEO is a later generational family member. This study also introduces the dependency of family firm innovation on country level factors, such as shareholder minority protection or education level of the workforce.

Despite the several studies carried out, the scenario of innovation in family firms in the extant literature is still blurred and there is not a unique and shared perspective among lecturers, this because family firms are not all equals and there are conjointly endogenous features that increase and reduce both the ability and the willingness to innovate. Therefore, the demand for further explanations to family firm innovation behaviours leads researchers to ask for deeper analyses regarding family companies innovation heterogeneity. In particular there is an emerging need for studies regarding the relationship of endogenous governance or ownership features with innovation within specific contexts, since institutional aspects have always been related to economic growth and firm behaviours. Duran et al. (2016) enunciate the necessity for further research to

study the impact of country-level variables on innovation, as well as Chrisman & Patel (2012) who state the importance of using other specific sampling frames, as their results could not be generalized to private, small or foreign firms. Therefore literature objectifies the need to investigate innovation behaviours in specific context to be able to capture family firm innovation heterogeneity.

However, to identify the proper research gap, it is important to have the full picture of innovation in family companies, and to consider a recent stream of study regarding the role of tradition in innovation practices. When we analyse this stream of research, the results are even more complex as the relationship between innovation and tradition is conflictual.

Past literature had always considered tradition as a threat for innovation, as relying on past knowledge leads to path-dependence, inflexibility, conservatism, inertia and core rigidity (Leonard-Barton, 1992; Sørensen and Stuart, 2000). However, recent studies support the role of tradition and past knowledge as a key opportunity that should be exploited to successfully innovate (Messeni Petruzzelli and Savino, 2015; De Massis et al., 2016; Manfredi Latilla et al., 2019; Presenza et al., 2019). According to them, tradition can represent a distinctive and unique resource of the firm, whose sticky and embedded nature makes it difficult for other companies to imitate (Barney 1991; Kanter, 1995). The mechanisms that explain the potential of tradition in innovation processes strongly depend on firms' knowledge interiorization and reinterpretation capabilities (Keen and Tan, 2007), this means that innovation advantages rely on the ability to access, use, interiorize, reinterpret and transfer temporally distant knowledge (Gurteen, 1998; Swan et al., 1999). According to this, literature claims that family businesses can have unique features and special capabilities to create links with the past,

present and future (Zellweger, Nason, & Nordqvist, 2012) through special routines that guarantee continuity over time (Shils, 1981), hence to successfully innovate through tradition. This theoretically reinforces the superior ability of family firms to innovate, thanks to the role of tradition, that can be achieved through a specific traditional context.

In this regard, existing literature wonders how tradition can be exploited by family firms to successfully innovate. This conducts to the realization of specific frameworks, based on a multi theory approach and on empirical evidence of some specific successful family companies, that explain how to leverage on tradition to innovate. The "Innovation Through Tradition" model, developed by De Massis et al (2016), represents one of the main frameworks in this research field, where the main sources of knowledge are represented by firm tradition and territory tradition; however, it is a recent stream of study and further research to provide empirical evidence with a quantitative approach are needed. In fact, even if there are frameworks explaining how to successfully exploit tradition to innovate, the paradox between tradition and innovation is not clear at all. Extant literature, focusing on successful business cases, is only at the starting point towards the identifications of those specific features that allow family firms to exploit the opportunity of traditions. It is still unknown if the superior ability to innovate led by the selection of a traditional context is confirmed and accompanied by a higher willingness to do so, and if a high innovative context can stress and impact on the willingness to innovate. James J. Chrisman et al. (2015) arise the gap upon the specific endogenous features regarding family firms heterogeneity that impact on this innovation paradox.

In addition, no empirical evidence has been provided to investigate the contradiction of family firms' superior ability to innovate and the lower willingness led by the traditional and innovative context.

Therefore, according to the strong relationship of innovation behaviours with family firms heterogeneity explained in the previous paragraphs, which leads to contradictory results, and according to the new conceptualized role of tradition on innovation, the goal of this dissertation is to prove empirical evidence to identify how the ability and willingness paradox varies (Chrisman et al., 2015) in a specific context characterized by a high level of tradition, which increases even more the ability of family firms to innovate (Zellweger, Nason, & Nordqvist, 2012), and by a high level of innovativeness, to stress the willingness of family companies to innovate. As well as this, this dissertation aims to contribute to existing literature providing empirical evidence on the relationship between family firms heterogeneity and the ability and willingness paradox, identifying how the most relevant features of family firms, family governance and long termism, affect the innovation paradox. Furthermore, the last objective is to understand the role of local embeddedness for family firms on this innovation heterogeneity, emphasizing even more the focus on the context, chosen to stress both the ability and the willingness to innovate.

These are the premises upon which this dissertation is based. Therefore, the considerations mentioned above lead to the generation of the research question that is formulated as follows:

'What is the influence of a traditional and innovative context on the family firms ability and willingness to innovate?'

Navigating within such a comprehensive research question, this paper identifies a series of hypotheses that help guide the story within a more formalised framework. In particular, the first set of hypotheses compares the main innovation behaviours of family firms to non-family firms, while the second set focuses only on family firms, explaining their innovation heterogeneity.

3.2 Hypothesis development

In this paragraph, we present and clearly explain the hypotheses formulated, according to the following sequence. First, we describe the dependent variable clarifying the importance to analyse the amount of innovation investments and the conversion ability as two distinct elements. Secondly, we formulate the hypotheses describing the impact of the independent variables selected for the model, both on innovation input and on innovation conversion.

3.2.1 The two dimensions of innovation: R&D investments and R&D conversion

The contradictory results of the research on innovation behaviours in family firms show the complexity of the research field and the necessity to analyse the behaviours more specifically. This converts not only into the identification of the impact of family firms heterogeneity on innovation behaviours, but also into the distinction of the different stages and processes of innovation. Therefore, differently from past literature, recent studies take into account the distinctiveness features of innovation processes, leading to a wider and brighter

understanding of this innovation heterogeneity (Chrisman et al., 2015). In particular, innovation processes are partitioned into two main categories: innovation willingness and innovation ability. Innovation willingness is defined as:

> *"The disposition of the family owners to engage in idiosyncratic behaviour based on the goals, intentions, and motivations that drive the owners to influence the firm's behavior in directions diverging from those of nonfamily firms or the institutional norms among family firms" (Chrisman et al., 2015)*

While innovation ability is defined as:

> *"The family owners' discretion to direct, allocate, add to, or dispose of a firm's resources"(De Massis, Kotlar, Chua, and Chrisman, 2014).*

Family firms ability does not always come with willingness (Chrisman et al., 2012; De Massis etal., 2014) as it could be logically thought. In fact, a peculiar condition of family firms is the so-called innovation paradox, which refers to a higher ability to innovate, contrasted by a lower willingness. However, this behaviour can vary significantly from family firm to family firm, due to family firm heterogeneity, institutional factors, and other features that can produce different impacts on innovation willingness and ability (Berrone, Cruz, and Gómez-Mejia, 2012).

For these reasons our dissertation, that aims at clarifying these paradoxical behaviours in a specific traditional and innovative environment, analyses and shows the influence of the selected independent variables both on the innovation ability and on the innovation willingness.

In the next paragraphs we describe the hypothesized effects of the family firms features selected for the research on both innovation willingness and innovation

ability, providing independent and distinctive explanations for the impact of the independent variables on the two different stages of innovation.

3.2.2 The effect of Family Ownership on R&D investments

Family firms are known for their risk aversion that leads to the lessen of R&D investments, due to their socio-emotional endowment and their strong non-financial goal to maintain the same level of control over the firm. The loss of firm control for family owners would represent a threat for the family socio-emotional wealth, hence the maintenance of the most relevant positions, of the family name and of the financial wealth become for family owners the prior goals, even more than economic ones (Gómez-Mejía et al., 2007). This effect is even amplified if we consider the traditional context taken into account for this research, as emotional attachment prevails and owners tend to overvalue the available knowledge represented by all the elements of tradition owned by the firm (Kotlar et al. 2020), generating wider reluctance to new and innovative products.

If we also consider that family owners' wealth is usually concentrated in few businesses (Anderson et al., 2003), we better understand their risk aversion and investment sensitivity, which results in the willingness to invest in more certain and stable assets, and to preserve their stability and actual control over the firms. Last, the unwillingness to ask for external sources of money (Mishra & McConaughy, 1999), which may lead to the reduction of control power over the firm, decreases even more the pool of resources that could be allocated to innovation. All these reasons prevail on the long-term orientation of family firms that would lead them to favour R&D investments as a source of long-term economic value. Hence the first hypothesis is formulated as follows:

Hypothesis 1 (H1): *Family ownership negatively affects R&D investments.*

Even if we expect family firms to invest less in R&D, the strong innovative context can weaken this relationship. This happens because the high innovativeness of the industry might engage customers in demanding for innovation, and a lower level of innovation of some family businesses can lead to a decrease of economic performances. The Myopic loss aversion framework clearly indicates that a reduction of firm economic performance in family firms provokes an increase of innovation investments higher than what can be observed in non-family firms.

3.2.3 The effect of Family Ownership on the conversion of R&D investments

The high level of control deployed by family owners, together with the unwillingness to dispense control, the wealth concentration and the reluctance toward external sources of funding make family owners extremely more committed to monitor managers, if compared to non-family firms.

In addition, the tendency of family businesses to create long-term and trust-based relationship with stakeholders (Berrone, Cruz, Gomex-Mejia, 2012), favours the creation of firm-level networks that give family firms a privileged access to resources that cannot be easily exchanged on the market (Rothamaermel & Hess, 2007) and an internal human capital that creates a community able to better accumulate and share implicit or tacit knowledge (Almeida, Song & Grant, 2002). These specific features strongly improve the resource orchestration, hence the ability of family firms to convert innovation input into output.

The traditional context reinforces the ability of family firms to innovate, since family businesses are known for having special capabilities to create links with the past, present and future (Zellweger, Nason, & Nordqvist, 2012) through stronger ties with past sources of knowledge (Capaldo, 2007; De Massis et al.,

2016) and special routines. Therefore, tradition can be better exploited by family firms rather than non-family ones to convert innovation input.

Thus, we hypothesize that:

> **Hypothesis 2 (H2):** *Family ownership positively affects the conversion of R&D investments.*

After having identified the main differences between Family and Non-Family Firms, the goal turns into the understanding of the discrepancies in innovation behaviours among family companies only and the identification of the causes of such differences. According to the extant literature, the possible reasons of this heterogeneity might be substantially clustered according to the governance systems (Carney, 2005), the goals (Chrisman et al., 2012) and the resources (Habbershon, Williams, & MacMillan, 2003). These elements can be influenced, respectively, by the composition of the BoD, by the long-term orientation and by the location (local embeddedness). For this reason, the next hypotheses will focus on the identification of the innovation heterogeneity among these three areas.

3.2.4 The impact of the composition of Board of Directors on R&D investments

In this first part we analyse the sources of heterogeneity affecting the willingness of family firms to innovate, measured by the R&D investments. In particular, the first dimension of heterogeneity regarding the Board of Directors composition that is analysed is the percentage of family members in this governance body. According to Zona, (2015), differences in board composition affect the board processes in family firms.

It is common knowledge that family firms are usually characterised by several internal conflicts between family members (Dyer, 1994), which may lead to an increase of agency costs, a reduction of the total amount of resources available

for innovation and a reduced ability to internalize knowledge (Jehn & Bendersky, 2003). Thereby, an increase of the number of family members results in an increase of the familiar conflicts, which reduces the amount of R&D investments However, thanks to Gómez-Mejía et al. (2007), we know that the primary goal of family members is to preserve and protect their socio-emotional wealth, which is translated into the sought and the recognition of the family superior authority, the occupation of relevant position and the control of the governing bodies within the firm. Therefore, family members involved in the business tend to give less importance to economic criteria, while prioritizing the continuity of family control and avoiding risky decisions. As R&D investments represent high risk investments if compared to more liquid or stable assets, the family members goal to maintain control negatively impacts on R&D resources allocation decisions. Clearly, an increased number of family members in the board of directors gives them more power to account for family needs regardless the business economic interests, limiting the amount of innovation investments. Opposingly, a lower number of family member in the board of director reduces their power to account for family interests. Even in this case, the traditional and innovative context might smooth the negative effect hypothesized. This can happen because a higher power concentration in the hand of the family members which guarantees lower formalization, results in expanded opportunities for family members to gather new knowledge from external sources (Kotlar et al, 2020). This ability to internalize knowledge, together with the privileged access of family members to resources not immediately available on the market (Rothamaermel & Hess, 2007) and to the higher amount of knowledge offered by the context, might boost and encourage family members to internalize these new competencies and reduce the

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perceived risk of R&D investments thanks to higher knowledge acquired. Thereby a higher percentage of family member can trigger this effect and the prevailing negative relationship can be smoothed by this.

These reasons allow us to formulate the next hypothesis as follows:

> **Hypothesis 3a (H3a):** *The level of family involvement in the board of directors negatively affects the amount of R&D investments.*

The second relevant dimension explaining the different behaviours in the quantification of the magnitude of R&D investments is the presence of a family CEO since this figure can provide guidelines, create routines, develop processes and manage knowledge flows within the organization (Crossan, Lane & White, 1999).

According to Hambrick & Mason (1984), a manager has a high level perceptual process and a limited field of vision, regulated by what it is selectively perceived, and also by a filter based on own cognitive base. Hence the manager final perception combines the own values and perceptions that reflect on the strategic choices (Hambrick & Mason, 1984).

In this case, the CEO priority to maintain a relevant and predominant position in the company strongly affects the CEO decision making. If we also consider a family CEO as an owner whose wealth is usually composed by few companies (Anderson et al., 2003), we understand even more its higher investment sensitivity and its preference to more certain assets rather than R&D investments, leading to their reduction.

These personal family interests strongly affect the CEO perception and cognitive base, that results in a strong commitment in preserving the own and family goals, hence reducing R&D investments.

If we also consider that the number of years working in the company is negatively related to the strategic choice toward innovation and diversification (Hambrick & Mason, 1984), we stress the assumption that a family CEO, who is supposed to be in the owned family company for many years, is less oriented to innovation and diversification (Hambrick & Mason, 1984).

Accordingly, we hypothesize that:

> **Hypothesis 3b (H3b):** *The presence of a family CEO negatively affects the R&D investments.*

The third and last dimension regarding the composition of the BoD is the number of family generations involved.

The relationship among family generations and innovation is still controversial in the existing literature. Some scholars sustain that there is a positive relation among them, in fact multiple generations involved in the company lead to more heterogeneity, which means having knowledge diversity (Milliken & Martins, 1996), defined as more people with different perspectives and expertise working in the team (Jehn et al., 1999; Postrel, 2002). So, this diversity can lead to greater innovative choices due to the various ideas and knowledge not available in a homogenous management (Talke et al., 2011; Talke, Salomo, & Rost, 2010). Moreover, it is demonstrated that the differences in the educational background generate multiple points of view, encouraging in this way innovative decisions (Simons, Pelled & Smith, 1999). But, on the other hand, such diversity can lead to an increase of the incompatibilities and conflicts between family members, enough to cancel the positive effect on innovation input due to the knowledge diversity. In fact, the team heterogeneity has a negative effect on the creation of a strategic consensus and a common perspective (Hambrick, Cho & Chen, 1996)

that are necessary to integrate the different points of view (Michie et al., 2006).

Therefore, in such conflictual context a reasonable strategy is the one to preserve the status quo, an approach that does not require exchange of views and avoids conflicts, but that also leads to the establishment of a comfort zone for each generation, which results in a reduction of the risk propension that consequently prevents innovative decisions (Sciascia, Mazzola & Chirico, 2013). Therefore, the attention is more focused on solving problems and conflicts of the past, rather than on investigating and taking new opportunities for the future, with a rigidity that precludes the capacity to change, so that the family businesses perceive innovative practices as a threat (Kellermanns & Eddleston, 2006).

Accordingly, we hypothesize that:

> **Hypothesis 3c (H3c):** *A higher number of family generations in the Board of Directors negatively impacts the R&D investments.*

3.2.5 The impact of the composition of Board of Director on the conversion of R&D investments

In addition to the influence of family on innovation willingness we analyse the impact of family on the innovation ability, measured as the conversion of innovation resources into innovation output.

In this regard, family can cause several different behaviours generating opposing results. From one side, the family members reluctance to select non-family managers, the so called "Nepotism" in hiring family managers (Webb, Ketchen, & Ireland, 2010), can reduce the heterogeneity of managers and leads to a lack of fundamental resources and skills to properly innovate. This absence of

competencies reduces the ability to innovate, hence the ability to convert innovation investments into output.

Furthermore, the frequent family conflicts, derived by a higher amount of family members, increase the agency costs and reduce the effectiveness of innovation in family firms.

Last, the increase of the percentage of family member in the BoD and the presence of a family CEO increase the power concentration in the hands of the family. This boosts the perception of higher power distance between family and non-family managers that results in a reduced incentive of lower hierarchical levels to contribute to the knowledge exploitation, namely "Realized Absorptive Capacity" (Kotlar, 2020). A lower level of realized absorptive capacity reduces the ability and the possibility to successfully use past or external knowledge to innovate.

On the other side, family firms' attention to non-financial goals, such as control stability and maintenance of long term and trust-based relationships with stakeholders, facilitates the development of a firm-level network and a firm-internal human capital that favour innovation input conversion.

In particular, the interactions between family and business at a relational and firm internal level, deliver an important advantage in the creation of human capital. The lower staff turnover, the use of informal management systems and communication methods that reduces information asymmetries, the fostering of employees' loyalty and the personal commitment lead to the creation of the Pseudo-Family (König et al., 2013), that favours the interaction and the accumulation of implicit or tacit knowledge (Almeida, Song & Grant, 2002), since employees tend to transfer knowledge between themselves more easily. A high

level of tacit knowledge among employees can promote the resource orchestration, favouring the innovation input conversion (Sirmon & Hitt, 2003). As well as this, the augmented support provided by family members superior knowledge of the firm helps employees in innovation development, increasing the conversion of R&D investments.

Besides, the ability of family members to create long term relationships with suppliers (Berrone et al., 2012) and loyal customers (Miller & Le Breton-Miller, 2005), together with special expertise to create links with the past, present and future (Zellweger, Nason, & Nordqvist, 2012), make family firms particularly suitable to receive relevant support from their network players (Phelps, 2010) and fully exploit the opportunities given by the traditional context, which enhance innovation conversion.

When the CEO belongs to the family all these features are emphasized and its own superior tacit knowledge (Polanyi, 1973; Nonaka & Takeuchi, 1995) for both monitoring the internal processes and dealing with external stakeholders, can be used to better orchestrate resources and increase innovation conversion.

Thereby, we state the following hypotheses:

> *Hypothesis 4a (H4a): The percentage of family members in the board of directors positively affects the conversion of R&D investments.*

> *Hypothesis 4b (H4b): The presence of a family CEO positively affects the conversion of R&D investments.*

Regarding the generational involvement in the BoD, the conflicts that arise from the diversity of generations can lead to an approach aimed at the maintenance of the status quo, which avoid discussions but also entrepreneurial initiatives. However, a higher number of generations involved leads also to a greater

knowledge diversity (Jehn, Northcraft & Neale, 1999; Milliken & Martins, 1996), for the combination of the different competences and perspectives that family members of different generations present (Chirico, Sirmon, Sciascia & Mazzola, 2011). In addition, they share the affiliation to the company and the family, which creates a "unified" social group (Ling & Kellermanns, 2010), a family environment that enhances the knowledge integration (Chirico & Salvato, 2008; Patel & Fiet, 2011). Moreover, later generations increase the positive effect of social capital and reduce the negative one of conflicts on the internalization of knowledge (Chirico & Salvato, 2014). Therefore, the contemporary presence of multiple generations increases the capability of exploiting the knowledge diversity, favouring its integration and internalization, so that family members become able to analyse problems from more points of view and consequently can have more innovative and creative thoughts (Fiol, 1994; Jehn, 1995; Burgelman & Hitt, 2007).

So, this sharing of explicit and tacit knowledge favours the resource orchestration, which increases the conversion of innovation input (Sirmon & Hitt, 2003).

Hence, our hypothesis is defined as follows:

> **Hypothesis 4c (H4c):** *The number of generations positively affects the conversion of R&D investments.*

3.2.6 The impact of long termism on the quantity and the conversion of R&D investments

A Long-Term Orientation is usually associated to the long-term objectives of family businesses, like generating and protecting wealth for the subsequent

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generations (Zellweger, 2007), preserving and increasing the family name (Miller & Le Breton-Miller, 2005), reaching a peaceful and successful family succession (Handler, 1994) and producing transgenerational value (Zellweger, Nason, & Nordqvist, 2012). So, since these are all objectives mainly related to the general goal of successfully transfer to subsequent generations a competitive company, a firm with high LTO will probably give a strong priority to such objectives. According to Le Breton-Miller & Miller (2006), in order to involve next generations in the business, investments in long-term capabilities and projects are requested, and therefore, important investments in R&D are necessary. Someone could note that the renewal of the family bonds through dynastic succession is also a dimension of the Socio-Emotional Wealth (Berrone, Cruz, Gomez & Meija, 2012), and so a strong LTO implies a great attention to the defending and developing of the wealth (Gomez-Mejia et al., 2007), which in turn reduces the R&D expenditures. However, we hypothesize that the intention to successfully transmit to future generations a valuable company prevails on the fear of losing socio-emotional wealth.

So, our hypothesis is:

> *Hypothesis 5 (H5): The Long-Term Orientation positively affects the amount of R&D investments allocated.*

As regards the relationship among the Long-Term Orientation and the conversion of R&D investments, it can be highlighted that family firms with high LTO, as said before, aim to achieve some non-financial goals, like the succession, the family harmony and the preservation of goodwill in the community (Lumpkin & Brighman, 2011). To realize them, in particular the last two, long-term relations among both internal members and external stakeholders are put

into practice. Therefore, creating long-term relationship with suppliers (Berrone et al., 2012) and loyal customers (Miller & Le Breton-Miller, 2005) increases the support that a family firm can receive from its network (Phelps, 2010), which provides resources and knowledge not immediately available in the market (Rothamaermel & Hess, 2007), thus improving the conversion ability. Moreover, the long-term relations to reach family harmony increases the level of trust and proximity between the family firm employees, favouring the interaction and the accumulation of tacit knowledge (Almeida, Song & Grant, 2002), which foster the resource orchestration and so the innovation input conversion (Sirmon & Hitt, 2003).

Consequently, our hypothesis is:

> **Hypothesis 6 (H6)**: *The Long-Term Orientation positively affects the conversion of R&D investments.*

3.2.7 The impact of local embeddedness on R&D investments and R&D conversion

A special relationship exists between family firms and local embeddedness, as family businesses are characterized by higher embeddedness with the regional community respect to non-family companies (Bird and Wennberg, 2014). This means that such organizations are capable of exploiting the advantages due to the involvement of economic actors in a geographically delimited network and/or institutional setting (Granovetter, 1973), having deeper relations with customers, suppliers, and local institutions (Cooke, 2007). Therefore, the strong embeddedness with the surrounding context favours the establishment of a cohesive community, which results in positive and collaborative relationship

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between the companies of the territory and all the local stakeholders. Moreover, the firms located within regions characterized by a strong local embeddedness, like the Industrial Districts, have easier access to tangible assets, like skilled workers, new technologies and scientific competencies (Baù, Chirico, Pittino, Backman & Klaesson, 2019). So, the collaborative environment with the possibility to have available such resources enhances the propension and the capability of family firms to invest in innovation.

 Thereby, we hypothesize:

> ***Hypothesis 7 (H7):*** *The Local Embeddedness positively affects the amount of R&D investments allocated*

Considering the relationship with the conversion of innovation input, it can be said that Local Embeddedness favours the access to the localized knowledge, which represents a unique resource, being very difficult to identify, transfer and replicate (Grant, 1991, Spender, 1993). Therefore, this privileged access to this tacit knowledge, strengthens the resources orchestration ability of the firms, which in turn favours the innovation input conversion (Sirmon & Hitt, 2003). Moreover, family firms embedded in a local context have high interest in the creation of united local communities (Pittino, Visintin, Sternad & Lenger, 2016) and in the establishing of ties with external actors (Arregle et al., 2007), so these positive and long-term relationship with local stakeholders positively influence the conversion capacity, since they provide to the firm a network of players (Phelps, 2010) with knowledge and resources not available in the market (Rothamaermel & Hess, 2007). An important role is also played by the tradition embedded in each specific territory, which can be a source of past knowledge (Messeni Petruzzelli & Albino, 2012). In fact, it can be internalized and hence

leveraged to foster the product innovation process (De Massis et al., 2016), which in turn improves the conversion of the innovation input.

Thus, we hypothesize:

> **Hypothesis 8 (H8):** *the Local Embeddedness positively affects the conversion of R&D investments.*

4. METHODOLOGY

In this fourth chapter a description of the methodology used for the empirical analysis is provided. The activities related to the identification of the Italian firms characterized by familiarity, tradition and innovation, were complex and time-consuming and they represent an important part of our work. They result in the setting up of a database which constitutes the backbone of this research. So, to properly give to our readers a clear understanding of these activities, in the next paragraphs we present and describe the reasoning behind the construction of the database and the processes of data collection, screening and analysis. Moreover, some guidelines are introduced to ensure disclosure and replicability of the outcomes, so that they may be eventually supportive for future research. In the first part we introduce the steps carried out for the identification of all the companies belonging to innovative and traditional sectors. In the second section the activities for the selection of the family firms are described. Then, an overall description of the variables employed in the analysis is provided. At the end, the models used for the quantitative analysis are explained.

4.1. Sample Selection

In our analysis we have decided not to consider all the Italian firms, but to focus our attention only on a small part of them. In fact, to study the relationship among familiarity, innovation and tradition, we have identified a particular type of firms, characterised by high innovation and high tradition. These are the companies belonging to the most innovative and traditional industries and represent a very interesting cluster for research in this moment of economic

development. According to the Istat report[2] based on the 2019 census, Italian firms are still lagging behind innovation field, with only the 16% of them that has implemented one or more innovative technologies, such as Big Data, 3D printing, Internet of Things or Blockchain; but, despite this, in 2021 the investments in these sectors are assumed to increase by more than 100%, with a prominent role played in this increment by the Covid-19 pandemic crisis, which has highlighted the importance of the digitalisation. Moreover, another important element that characterize Italian companies is constituted by the role of tradition, which has recently been studied in combination with innovation. In fact, in 2014, Petruzzelli and Albino introduced the concept of Innovation Through Tradition (ITT), further developed in 2016 by De Massis, Frattini, Kotlar, Petruzzelli and Wright, who studied it in relation with family firms. Hence our principal aim in the creation of the database was to determine those companies that innovate in compliance with the cultural heritage, exploiting the Italian tradition. For this reason, we performed simultaneously two different analyses, one aimed at detecting the most innovative sectors, and the other designed to identify the most iconic sectors of the "Made in Italy". Then these two results were combined to create a unique set of sectors that are both traditional and innovative. The sectors to which we refer are defined by the ATECO 2007 code, a typology of classification adopted by Istat since January 2008. It classifies 99 sectors with an alpha-numerical method: the letters specify the macro-sector of economic activity, while the numbers, going from two to six digits according to the level of

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detail, identify the sections and sub-groups of these macro-sectors. Now the two analyses conducted in parallel are described.

4.1.1 Identification of innovative sectors

This part of the analysis was conducted through the usage of the AIDA and ORBIS databases, online datasets containing information of all the Italian companies. For each sector all the companies belonging to it have been extracted, and then for each company the following elements have been taken in consideration: the firm name; the ATECO code; the Research, Development and Publications costs for the years from 2016 to 2019; the value of the Patents for the years from 2016 to 2019; the number of the granted Patents at the year 2019; the Revenues for the years from 2016 to 2019; the value of the Total Assets for the years from 2016 to 2019; the current ratio index for the years from 2016 to 2019; the operational and legal headquarter in 2019 and the number of employees for the years from 2016 to 2019. The 2020 was not taken in consideration because, when this analysis was performed (beginning 2021), the data about this year were not still available for all the companies of our interest. Moreover, the data of this year were influenced by the Covid-19 pandemic crisis, making it difficult to compare them with the ones of the previous years. At the end we used such information to create three quantitative indicators of innovativeness that are described below.

A. R&D investments: this first indicator takes into consideration the expenses in Research, Development and Publications for each sector. It was determined first summing the expenditures on research of all the companies of each sector for the years from 2016 to 2019, then the average value of these 4 years was computed. Since the R&D values could be

affected by the size of the companies, this average value was divided by the average of the yearly sum of the Revenues (same sector, companies and years as before). This size element was chosen because, like the R&D expenses are a component of the Income Statement, similarly it is accounted in the same manner.

B. Patent Value: the second indicator expresses the value of the patents of each sector. It was computed summing, for all the companies of each sector, the value of the patents owned by the firms for the years 2016 to 2019, then the average value of the 4 years was calculated. Then, as for the previous indicator, to avoid inconsistency of the data due to the size of the companies, the average value was divided by the average of the sum of the Total Assets (same sector, companies and years), which is present like the Patent Value, in the Balance Sheet – Asset Side.

C. CAGR (Compounded Annual Growth Rate): this third and last indicator indicates the growth of each sector. It was computed taking in consideration three elements: the value of the Total Assets, the value of the Revenues and the Number of employees. For each sector we have done, as before, the sum of these firms' values for each of the year from 2016 to 2019, then we have computed for each sum the respective growth relative to the previous years thanks to the following formula: *Value (year) − Value (year−1) / Value (year−1)*, and, later, the average growth over the 4 years was calculated. Subsequently, these three average growths of each sector have been used to determine a compound growth, giving a weight of 1/3 to each element.

At this point, all the indicators with the respective sectors were inserted in a Microsoft Excel spreadsheet. Then the RANGO.UG function was carried out in order to establish a ranking, thus leading to the creation of three different lists, in which the top positions were occupied by the sectors with greater R&D expenses, patent value and CAGR scores. At this point we decided to assign to each sector three values corresponding to the positions occupied in the three rankings, then we have summed these numbers and we have used again the RANGO.UG function. This led to the creation of the final ranking, in which the first positions are occupied by the sectors with the lowest scores, indication of a top location in the rankings of the single elements. Finally, from this last list we were able to identify the most innovative sectors, which are:

1) ATECO 30: Manufacture of other transport equipment

2) ATECO 62: Software Production, Computer Consulting and Related Activities

3) ATECO 26: Manufacture of Computer, Electronic and Optical Products; Electromedical, Measuring and Watchmaking Equipment

4) ATECO 95: Repair of computers and personal and household goods

5) ATECO 32: Other manufacturing industries

4.1.2 Identification of traditional sectors

For the identification of the traditional sectors four different parameters have been taken in consideration:

A. Presence of Primates: for the occurrence of this first parameter, we refer to a sector that is considered and perceived as an excellence abroad. To properly understand what means to be a sector of excellence, the 2019

Symbola report[3], "I.T.A.L.I.A 2019 - Geographies of the new Made in Italy", was very useful, since it illustrates the industries that are recognised as the most representative of the Italian industrial production. In fact, such report demonstrates that the sectors of Clothing, Automation and Mechanics, Agribusiness and Furniture are those for which Italy is recognized at the world level. These sectors are identified as "4A", (Abbigliamento, Apparecchi, Alimentari and Arredi), sectors of excellence of the "Made in Italy". These mainly correspond to the ATECO sectors that go from 10 to 33.

B. Presence of Industrial Districts: this second indicator is related to the Industrial Districts, which are part of the history of the Italian economy. To understand to what sector belongs an industrial district, a file referring to year 2011 with the list of all the districts was obtained from the ISTAT website. Such document shows also the locations and the industry specializations of each district. Then we assigned to each specialization the corresponding ATECO sector, and so we were able to identify the sectors with industrial districts. These have resulted to be all in the first 40 sectors, with some districts that belong to the same sector and with some sectors that do not have a district.

C. Industry export shares: this third parameter is related to how much a sector exports abroad, ad so, to how much such sector is appreciated by

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[3] "I.T.A.L.I.A 2019 - Geographies of the new Made in Italy" - 2019 Symbola report,

  https://www.symbola.net/ricerca/i-t-a-l-i-a-2019

the world. We think that is an important parameter to identify the sectors that are most representative of the traditional "Italianness" worldwide. The data of the exports have been provided by the Istat website and are related to the years 2016 to 2019. For each sector we have a percentage, which refers to its export share respect to the total amount of exportations made by all the sectors together. These data, as for the Industrial Districts, are related to only the first 40 sectors, the manufacturing ones.

D. Golden Power in the sector: the last indicator is a special power that the Italian government can exercise on strategic companies, this power includes prescribing strict conditions to the acquiring shareholders, stopping some company decisions and rejecting the acquisition from certain shareholders. The Golden power is used with the purpose to safeguard the ownership and the activities of companies in sectors of national interest, like security and defence, transport and infrastructures, energy, telecommunications, technology, agri-food and semiconductor. Therefore, since these are sectors of strategic interest for the government, they can be defined as representative of the Italian identity and the Italian future economic development.

At this stage, like before, the four respective parameters for each sector were inserted into a Microsoft Excel spreadsheet. Since the characteristic of traditionality is mainly a qualitative variable, we did not go for a ranking of traditional sectors, using quantitative computations as for the innovativeness. To remain consistent with the analysis, we decided to proceed in the following way, to define a selection criterion for industry traditionality:

Initially, we have done the average of the export shares of the sectors, which has resulted to be equal to 3.63%, value used later as lower bound.

Then, we have decided that a sector can be considered as representative of the "Italianness" if at least one of the next conditions is satisfied:

- In the sector there is presence of Primates, so it is perceived as an excellence worldwide, and represents the "Made in Italy".

- There is at least an Industrial Districts in the sector taken in consideration.

- The percentage of exportations of the sector is greater than the average percentage of exportations computed before.

- The sector is one of those safeguarded by the Golden Power.

Therefore, after this selection, all the sectors without one of the previous conditions were removed.

At the end, also the sectors included in the tertiary macro-sector (sector 44 and following ones), were discarded, since these are related to the fulfilment of services, while our interest is on the manufacturing companies.

Finally, after all these consideration, 25 sectors, respect to the original 99, were identified as traditional.

4.1.3 Innovative and Traditional sectors selection

At this stage, to identify the innovative and traditional sectors, we have combined the two different analyses. Using always an Excel file, we added a dummy variable for each sector in the ranking of innovativeness, with a "Yes" if it is traditional and an empty space if not. Analysing this list, we realized that going down along the ranking, the "Yes" decreased in an almost proportional manner, and so that the most innovative sectors have also higher probability to be traditional. Then we used an "AND" function to finally choose the sectors

both innovative and traditional. After a computation of the time needed to evaluate the familiarity variables of each company, we have decided to take in consideration the 11 most innovative sectors, of which 6 are also traditional. These 6 sectors are the following:

- ATECO 15: Manufacture of leather and imitation leather goods

- ATECO 21: Manufacture of Basic Pharmaceutical Products and Pharmaceutical Preparations

- ATECO 26: Manufacture of Computer, Electronic and Optical Products; Electromedical, Measuring and Watchmaking Equipment

- ATECO 28: Manufacture of machinery and equipment NCA 51

- ATECO 30: Manufacture of other transport equipment

- ATECO 32: Other manufacturing industries

Once identified the sectors, we have extracted through an Excel file the companies belonging to them. Our aim was to conduct an analysis on the small and medium enterprises (SME), since in these companies the role of the family is stronger, because the shareholders and the managers are usually part of the same family (Arzubiaga, Kotlar, De Massis, Maseda, Iturralde, 2018). So, for the six ATECO codes selected, only the firms with a number of employees higher than 10 and with revenues ranging from 20M€ and 250M€, for at least one year between 2016 and 2019, were taken in consideration. So, the total number of companies selected was 2165.

4.1.4 Measuring the family ownership

Arrived so to the list of 2165 companies, it was necessary to identify which of these were family or not. To understand this, according to some approaches discussed in the existing literature (Anderson & Reeb, 2003; Block et al., 2013),

the primary concept on which we relied was the family ownership. In fact, when the majority of the shares, at least 51%, was owned by one or more family members, the companies were considered as family. The ownership structure considered was directly the one of the firms if the companies were not controlled by a holding, otherwise the ownership of the Global Ultimate Owner (GUO) was taken in consideration. For some companies it was quite easy to check the ownership, indeed just controlling the family names of the shareholders was enough to understand if they were part of the same family or not. But for the older companies, which have been existing for generations and nowadays are owned by second and also third cousins, the family names were not sufficient. Consequently, we checked also the residential addresses and the places of birth, knowing the inclination of family members to live close to each other. Unfortunately, it was impossible to do an additional check of familiarity using social networks, like Linkedin and Facebook, since we did not know exactly all the information of the people we were looking for. So, we have considered as part of the same family, shareholders who lived in the same street, checking also the date of birth in the tentative of reconstructing the degree of relationship. Once identified the family ownership, the database with only family firms was completed. At this point, to properly map the family firm's heterogeneity (Chua, Chrisman, Steier, & Rau, 2012), as previous explained in the introduction, we decided to take into account the level of family involvement, the Long-Term Orientation and the Local Embeddedness.

4.1.5 Measuring the level of family involvement

This variable was identified, as previous research did (Anderson & Reeb, 2003; González-Cruz & CruzRos, 2016), with different dimensions, three in our case: The percentage of family members in the Board of Directors, the Family CEO and the number of generations involved in the Board of Directors.

- The percentage of family members in the Board of Directors: such percentage is an expression of family involvement since it influences the decisions of the firm, with a greater number of family members in the Board of Directors that enhances the family interest.

- The Family CEO: it is a role that increases the power within the firm, and so if it is played by a member of the family, there is higher family involvement because the authority of the family is strengthened.

- The number of generations involved in the Board of Directors: the last indicator of family involvement is less used respect to the previous ones, but however has been studied by different authors (Kellermanns & Eddleston, 2006; Sciascia, Mazzola & Chirico, 2013). It measures the number of different generations involved in the Board of Directors, with a greater number that indicates higher family involvement, but also stronger family conflicts among generations (Bertrand & Schoar, 2006).

4.1.6 Measuring the Long-Term Orientation

In the literature the Long-Term Orientation (LTO) has been measured through proxies, usually collecting primary quantitative data with surveys and interviews, but we were not able to proceed in this way. So, we have decided to

use the following formula: Capital Expenditures / Depreciation[4] [5]. In fact, the Capex can be considered as long-term investments, since purchasing and upgrading assets, means investing in the future, in order to create a long-term advantage and so to bequeath to subsequent generations a stronger company. Then we have decided to divide the Capex by the depreciation, to check if they were really investments or just expenses to avoid the amortisation. The data of Capex and Depreciation have been always obtained by the AIDA database.

4.1.7 Measuring the Local Embeddedness

The existence of Local Embeddedness was measured considering if a firm is located or not within an Industrial Districts of its specific industry. To determine this, we identified for each Industrial Districts, using the 2011 Istat document[6], the respective province of belonging and the respective sector of specialization. Then we have considered only those districts whose specialization was included in the six sectors considered. After that, we have analysed the companies, highlighting the sectors of belonging and finding the respective province of the business operative headquarter. At the end, through an Excel comparison

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4 What Are the Types of Capital Expenditures (CapEx)? (investopedia.com) By THE INVESTOPEDIA TEAM Reviewed by AMY DRURY, April 30 2021.

5 Capital Expenditure (CapEx) Definition (investopedia.com) By JASON FERNANDO Reviewed by MARGARET JAMES , April 10 2021.

6 " 9° Censimento dell'industria e dei servizi e Censimento delle istituzioni non profit" - I DISTRETTI INDUSTRIALI 2011 – ISTAT 2015

formula, the companies with same province and same sectors of the districts were taken in consideration.

4.1.8 Additional Methodological Specifications

As regards the 2165 companies selected, only the ones with GUO based in Italy were taken in consideration, so the familiarity analysis was carried out on a database consisting of 1548 firms. Then, after the choice of the variables, this number decreased even more, since only 263 companies, considering both the AIDA and ORBIS databases, presented all the data needed. It is important to highlight that the most common missing data was the R&D investments, with 1152 firms without it. Consequently, the dataset employed in the regression analysis was composed by 'only' 263 companies.

4.2 Variables

The analysis was carried out through a regression analysis that is explained in the following paragraph, with the usage of the SPSS software. The following variables have been employed.

4.2.1 Dependent variables

To measure the innovation, we have decided to use two different variables. One refers to the willingness to innovate, hence Innovation Input and the other to the ability to innovate, hence Conversion of innovation input. The metrics used for the two variables are the following:

- Innovation Input: such variable is used to calculate how much a firm invests in innovation and is largely employed in the literature in which it is mainly measured through the *R&D expenses*, which consistently we

decided to utilize. This measure is particularly suitable for our sample of companies, since the manufacturing firms usually have high degree of obsolescence of the products, and therefore the R&D investments are commonly employed with the aim to build a sustainable competitive advantage (Kotlar, De Massis, Fang & Frattini; 2014). In the regression model, the logarithmic transformation has been applied.

- Conversion of innovation input: this variable aims to determine the capability to exploit the innovation input and convert it into innovation output. According to extant literature (Anderson, Duru & Reeb, 2009), we decided to use the following metric: $Number\ of\ granted\ patents_t / R\&D\ expenses_{t-1}$. In the regression model, also for this variable, the logarithmic transformation has been applied.

4.2.2 Independent variables

To test the several hypotheses different independent variables have been employed.

- Family ownership: independent variable of H1 and H2, it was measured with a dummy variable, in which 1 indicates a family firms, while 0 implies a non-family. Even though we have computed the percentage of family ownership, as described in the previous section, we did not exploit it because it was not in the interest of the goal of the analysis.

- The presence of a family management: to test H3a and H4a, the family members in the BoD were identified with the same methodology used for the family ownership, then their number was divided by the total number of members in the body to arrive to the final percentage of family members in the Board of Directors.

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- Family CEO: used for H3b and H4b, we have applied the same method of before to evaluate the familiarity. It is a dummy variable, in which 1 means that there is a family CEO, 0 a non-family one.

- Number of generations: independent variable of H3c and H4c, for this variable it was very important the dates of birth of the Board of Directors' members. We have considered the existence of multiple generations with a difference of more than 20 years among the dates. This variable assumes values from 0 to 3.

- Long-Term Orientation: used for H5 and H6, it assumes numerical variables resulted by the division introduced above.

- Local Embeddedness: employed for H7 and H8, it is a dummy variable, 1 implies the presence in an Industrial Districts, 0 means that the company is located outside the district.

4.2.3 Control Variables

To exclude noise and alternative explanations of the regression and to execute a more adequate analysis, some control variables have been used, with the data obtained as usual from the AIDA database. In particular we used those variables, one-year lagged, that may influence the results, which are:

- Firm size: it is measured in two ways, the $Number\ of\ employees_{t-1}$ and $Total\ revenues_{t-1}$, it assesses the effects due to the dimensions of the companies and the organizational inertia (Kelly & Amburgey, 1991).

- Slack resources: measured using the Current Ratio index, calculated as $Current\ Assets/Current\ Liabilities$ (De Massis et al., 2018), affects the

aspiration level of the companies, since managers use financial indicators to take strategic decision (Bourgeois, 1981)

- Firm Age: it expresses the years of existence of the firm (Zahra ,2003) and it is another indicator for monitoring the organizational inertia (Kelly & Amburgey, 1991).

- Firm efficiency: it is measured through the return on assets (ROA), which controls the overall firm efficiency (Chrisman & Patel, 2012).

- Indebtedness: it is evaluated through the Financial Gearing index, which is computed as $\frac{Financial\ debt}{Total\ equity}_{t-1}$: this indicator helps to monitor those effects due to the level of financial debt, which can influence the firm survival (Gómez-Mejía et al., 2010).

- Size of the Board: it is measured through the number of members appointed in the Board of Directors (Zahra et al., 2000).

- Industry: it is used to control exogenous influences due to the belonging sector, it is measured through 6 dummy variables, one for each of the ATECO codes selected.

- Location: it takes into account the effect of the territory development on innovation, is composed by 4 variables: North (companies located in Lombardia, Piemonte, Trentino, Friuli, Veneto and Valle d'Aosta), Center-North (Liguria, Emilia-Romagna and Toscana), Center (Lazio, Umbria, Marche and Abruzzo) and South (Campania, Molise, Puglia, Basilicata, Calabria, Sicilia and Sardegna).

4.3 Data analysis

In this paragraph we describe the statistical techniques used for the quantitative analysis as well as all the steps carried out to be able to implement and choose it. The primary activity refers to the data preparation. In fact, as specified in the previous paragraphs, it was impossible to use the data as they were when imported from AIDA tool.

The first main issue was related to data incompleteness; hence we decided to delete from the sample all the companies that lack one of the data needed for the model. In particular, we noticed an enormous lack of data regarding the "Research and publications costs" (R&D). Up to 1152 firms among the sample of 1548, did not have this information or showed a value equal to zero. To better understand the reasons behind this issue, we tried to directly contact through a phone call the accountability department of a sample of 5 firms, among which all of them had a positive number of patents, meaning that the company was active in innovation activities, and the R&D value was zero or not available. All the companies called revealed to us that research and development was carried out in the company, however, the costs of the personnel and the tools required were not allocated in the balance sheet as R&D costs, but simply allocated to different departments of the company in the profit and loss statement. This was due to the absence of full-time workers for R&D activities or to the refusal to capitalize specific R&D expenses and register them simply as costs to lower the gross profit, hence the taxable amount. For this reason, we decided to eliminate all the companies that did not have or simply showed a value equal to zero for the R&D costs. We noticed that this behaviour was more typical for lower size companies,

in fact the average value of total revenues of the companies eliminated from the sample was 43,873 million € while for the remining ones it was 65,869 million €. Once eliminated all the other companies that have uncomplete data, we reached a total sample of 263 firms.

As our goal was to use a multiple linear regression analysis, which is very sensitive to outliers, it was necessary to remove them. We applied the "Box and whisker" technique to all the numerical variables used in the remaining dataset. This technique, differently to the z-index technique, is independent to extreme values and works eliminating those data that are outside the external lower and external upper edges, which are defined as follows:

External lower edge $= Q_L - 3D_Q$

External lower edge $= Q_U + 3D_Q$

$D_Q = Q_U - Q_L = Q_{0,75} - Q_{0,25}$

The removal of the outliers has been deployed for each numerical variable and it led to a full sample of 186 companies, almost a quarter less of the initial database. This happened since the outlier companies of the ten variables from which outliers were removed did not overlap, and the few outliers for each variable resulted in a relevant reduction of the dataset.

The last step carried out to satisfy the condition of the normal distribution of the residuals for the multiple linear regression, is the transformation of some variables. Thanks to the use of the histograms and the QQ plots, we identified and transformed into the logarithmical scale the following variables:

- Total revenues (2018)

- Number of employees (2018)

- Current ratio (2018)

- Age of the firm

- Research and development costs (2019)

- R&D conversion (2019)

In addition, for the categorical variables available in the dataset we created the corresponding dummy variables, which means the creation of a variable with the name of the categorical attribute, which assumes value 1 if the variable assumes that value, 0 otherwise.

At this point, as all the steps for the data preparation have been completed, we can describe the models used, considering that we used the full dataset of both family and non-family firms for model 1 and model 2, and the dataset made of only family firms for model 3, model 4, model 5, model 6, model 7, model 8, model 9 and model 10.

Before explaining them in detail, we describe the procedures used for all of them to check the assumptions needed to use the OLS regressor in the multiple linear regression models.

We calculated the correlations between the variable used in the models, (Table 1 for full dataset; Table 2 for Family firms only dataset) to test for possible multicollinearity. For further checks due to possible correlations among the control variables, we calculated after each model the Variance Inflation Factors to reduce the risks of multicollinearity. All the values were lower than 4.0, this indicates that there were no significant multicollinearity biases.

To check for any possible risk of auto-correlation among the residuals, we used the Durbin Watson test for each model. All the values, which were between 1.5 and 2.5, represented the absence of auto-correlation.

Last, to test for heteroscedasticity we used the scatterplot and the QQ plot of the residuals, which show the absence of heteroscedasticity and the normality of residuals in all the models.

Regarding the models used, to test for hypotheses H1 and H2, whose goals were based on the different innovation behaviours of family firms compared to non-family firms, the full dataset with both family and non-family firms was necessary. H1 has been tested by model 1, while H2 by model 2. The two models respect the assumptions for OLS regressor, hence the multiple linear regression was carried out. Table 1 represents the list of the variables used in the two models, their main descriptive statistics and their correlations; the dependent variables are R&D expenses and R&D conversion for model 1 and model 2 respectively. From the table we do not have any relevant correlations between the independent variables. In addition, in all the cases the correlation is below the cut-off limit of 0.7 allowed in the regressions (Hair et al., 1998). This, together with the VIF values of the models below 4, allows us to eliminate the risk of multicollinearity from the models.

To test for all the other hypotheses (H3a, H3b, H3c, H4a, H4b, H4c, H5, H6, H7, H8), whose goals are to spot the innovation heterogeneity of family businesses, only the family firms have been selected among the companies in the previous dataset. Therefore the dataset for this set of hypotheses and models is made by the 112 family firms that made part of the previous dataset of 186 companies.

Even in this case the OLS regressor has been selected and all the assumptions have been verified for all the model deployed. Table 2 shows the list of the variables used in the models, the main descriptive statistics and the correlations. Concerning the dependent variables, model 3, model 4, model 5 and model 6

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refer to the R&D investments, while model 7, model 8, model 9 and model 10 refer to the R&D conversion. Even in this case, from the table we do not have any relevant correlations between the independent variables, and in all the cases the correlation is below the cut-off limit of 0.7 allowed in the regressions (Hair et al., 1998). Thereby there is not relevant risk of multicollinearity as also the VIFs for the models are below 4.

Table 1 - Descriptive statistics and correlation between the variables of models 1 - 2

Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1 - Family Firm	0,60	0,49	--																			
2 - Revenues	17,50	0,62	0,054	--																		
3 - Employees	4,91	0,64	0,029	,745**	--																	
4 - ROA	4,64	5,27	-0,012	0,026	-0,087	--																
5 - Current Ratio	0,33	0,35	,164*	0,09	0,014	,238**	--															
6 - Age	3,35	0,61	,196**	0,117	0,063	-0,006	0,134	--														
7 - Debt ratio	1,00	0,83	-0,01	-,205**	-0,096	-,197**	-,478**	-0,101	--													
8 - Total number of manager	10,91	5,19	-0,143	,434**	,451**	-,147*	-0,045	0,086	-,154*	--												
9 - Industry 15	0,04	0,18	,148*	0,104	0,031	-0,086	0,129	0,042	-0,02	-0,05	--											
10 - Industry 21	0,05	0,22	0,03	-0,1	0,019	-,186*	-0,023	0,087	0,144	0,018	-0,041	--										
11 - Industry 26	0,06	0,25	-0,01	0,026	0,031	0,085	,153*	-0,1	-0,065	,148*	-0,048	-0,059	--									
12 - Industry 28	0,77	0,42	-0,071	0,033	0,026	0,077	-0,014	0,025	-0,137	-0,079	-,338**	-,418**	-,486**	--								
13 - Industry 30	0,04	0,19	-0,07	-0,093	-0,009	0,003	-,168*	-0,141	,187*	-0,024	-0,036	-0,045	-0,052	-,366**	--							
14 - Industry 32	0,04	0,20	0,064	0,003	-0,13	0,008	-0,086	0,074	0,051	0,029	-0,039	-0,048	-0,056	-,393**	-0,042	--						
15 - North	0,61	0,49	-0,023	0,021	-0,026	0,104	0,03	0,046	-0,132	0,014	0,022	-0,127	-0,058	0,093	-0,015	0,008	--					
16 - North - centre	0,31	0,46	0,025	0,019	-0,028	-0,021	-0,025	-0,02	0,079	-0,009	-0,123	0,01	-0,082	0,058	0,05	0,029	-,838**	--				
17 - Centre	0,05	0,22	-0,021	-0,032	0,055	-0,074	-0,021	-0,118	0,128	0,004	-0,041	,183*	,247**	-,178*	-0,045	-0,048	-,281**	-,152*	--			
18 - South	0,03	0,18	0,024	-0,069	0,077	-0,141	0,01	0,071	0,003	-0,02	,311**	0,101	0,076	-,193**	-0,036	-0,039	-,227**	-0,123	-0,041	--		
19 - R&D investments	13,08	1,66	-0,111	,314**	,316**	-0,133	-,227**	-0,131	0,061	,286**	-0,049	-0,064	0,05	0,046	0,132	-,168*	-0,036	0,082	0,055	-,181*	--	
20 - R&D conversion	-10,32	1,72	0,096	0,1	0,072	0,117	,259**	,230**	-,225**	0,013	0,026	0,008	-0,056	0,078	-,244**	0,104	-0,013	0	-0,007	0,042	-,291**	--

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In order to isolate the effects of the independent variables and to avoid even less the risk of multicollinearity, we decided to carry out specific multiple linear regression models with one set of independent variables one at a time. For these reasons, model 3 refers to the effect of the Board of Directors composition, model 4 to the effect of long termism and model 5 to the effect of local embeddedness on the R&D investments, while model 7, model 8 and model 9 on the R&D conversion respectively. In addition, to check for robustness we developed model 6 for R&D investments and model 10 for R&D conversion where all the independent variables have been used. This allows us to verify the real effect of a single variable.

To check for the goodness of fit of all the models, we used the adjusted R squared, which is always between 0,2 and 0,5, in accordance with the other quantitative analysis in family firms extant literature (Example: Block 2012, 'R&D investments in family and founder firms: An agency perspective').

In the next chapter, the results of the analysis are presented.

Table 2 - Descriptive statistics and correlation between the variables of models 3 − 4 − 5 − 6 − 7 − 8 − 9 − 10.

Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1 - Family member in the BoD	0,60	0,30	--																							
2 - Family CEO	0,88	0,32	,280**	--																						
3 - Family Generations in the BoD	1,62	0,59	,226*	,238*	--																					
4 - Current Ratio	1,10	0,55	0,089	0,079	-0,127	--																				
5 - Presence in industrial distric	0,52	0,50	-0,017	0,041	0,008	0,056	--																			
6 - Revenues	17,53	0,61	-,197*	-0,13	-0,136	0,029	0,136	--																		
7 - Employees	4,93	0,60	-,233*	-0,084	-0,131	0,07	0,082	,728**	--																	
8 - ROA	4,59	4,84	-0,011	-0,111	-0,01	,294**	,216*	0,152	0,002	--																
9 - Current Ratio	0,38	0,35	-0,107	-0,053	-0,101	0,104	0,107	0,159	0,044	0,151	--															
10 - Age	3,45	0,56	-0,105	-0,046	-0,027	0,071	0,077	0,008	-0,018	-0,002	0,148	--														
11 - Debt ratio	0,99	0,79	0,167	0,143	0,106	-0,069	-,223*	-0,167	-0,058	-,217*	-,612**	-0,098	--													
12 - Total number of manager	10,31	4,56	-,400**	-,221*	0,059	-0,044	0,043	,464**	,448**	-0,101	0,048	0,136	-0,153	--												
13 - Industry 15	0,05	0,23	0,082	-0,161	0,021	0,132	-0,088	0,128	0,037	-0,12	0,135	0,019	-0,026	-0,043	--											
14 - Industry 21	0,05	0,23	-0,041	0,086	-0,115	-0,032	-,247**	-,199*	-0,039	-,274**	0,039	0,077	-0,006	-0,043	-0,057	--									
15 - Industry 26	0,06	0,24	-0,12	0,094	-0,02	0,155	-0,046	0,019	0,062	0,064	0,082	-0,169	-0,066	0,145	-0,061	-0,061	--									
16 - Industry 28	0,75	0,44	0,094	-0,016	0,009	-0,172	,351**	0,007	0,002	,193*	0,018	0,012	-0,095	-0,142	-,412**	-,412**	-,447**	--								
17 - Industry 30	0,03	0,16	-0,035	-0,113	0,109	-,198*	-0,172	-0,032	0,057	-0,041	-0,154	-0,016	,286**	0,074	-0,039	-0,039	-0,043	-,287**	--							
18 - Industry 32	0,05	0,23	-0,068	0,086	0,021	,207*	-0,167	0,061	-0,109	-0,016	-,186*	0,074	0,079	0,15	-0,057	-0,057	-0,061	-,412**	-0,039	--						
19 - North	0,60	0,49	0,025	-0,183	-0,009	-0,002	,303**	0,115	0,003	0,041	-0,009	0,179	-0,133	0,157	0,033	-,209*	-0,165	,200*	-0,09	0,033	--					
20 - North - centre	0,32	0,47	-0,039	0,13	-0,006	-0,069	-0,139	-0,086	-0,057	0,065	-0,021	-0,147	0,096	-0,153	-0,164	0,091	-0,099	0,044	0,123	0,006	-,840**	--				
21 - Centre	0,04	0,21	-0,079	0,078	-0,006	-0,02	-,224*	-0,011	0,071	-0,046	0,01	-0,18	0,105	0,023	-0,051	0,141	,480**	-,275**	-0,036	-0,051	-,264**	-0,149	--			
22 - South	0,04	0,19	0,121	0,07	0,044	,200*	-,199*	-0,074	0,056	-,220*	0,065	0,096	-0,006	-0,056	,382**	0,168	0,149	-,333**	-0,032	-0,046	-,235*	-0,132	-0,042	--		
23 - R&D investments	12,93	1,68	-,254**	-,197*	-0,11	-,249**	0,023	,317**	,264**	-0,11	-,206*	-0,06	0,135	,269**	-0,04	-0,03	-0,04	0,054	0,137	-0,1	-0,01	0,102	0,053	-,304**	--	
24 - R&D conversion	-10,18	1,70	-0,07	0,04	-0,04	,223*	0,065	0,009	-0,02	,206*	,282**	,187*	-,291**	0,035	0,016	-0,06	0,018	0,071	-,226*	0,051	-0,02	-0,05	0,007	0,148	-,205**	--

5. FINDINGS

This chapter is oriented to the description and the analysis of the results emerged from the quantitative analysis. It is split into two main parts: in the first one, the main descriptive information of the two datasets is shown, while in the second, the results of the regression analysis are clearly explained.

5.1 Descriptive analysis of the sample

In this section we show for the completeness of the dissertation, some useful insights regarding the two samples analysed: the family and non-family sample first and the family only sample later. It is important to remind that the two samples use the same company selection base, however the family firms sample contains only those family companies that are contained in the sample with all the companies.

5.1.1 Family and non-family firm sample

Regarding the sample with family and non-family companies, the average age of the companies is 33,58 years. This value must but interpreted together with the fact that some of the firms in the sample have undergone company reorganization in recent years, as well as a change in their company name. This phenomenon dates them later than the actual year of foundation. A proof can be represented by the existence of more than one family generations in the Board of Directors, even if the company, according to AIDA foundation year, is quite young and has been founded in the late 2000s. Nevertheless, we decide to keep

the age within the variables tested in the model since it only helps in reducing possible noise in the regression and this phenomenon is not very frequent.

Moreover, in this sample, we observe that 60,2% are family firms, with an average age of 36,24 years and 39,8% are not, with an average age of 29,55 years. This distribution is absolutely aligned with the studies carried out by AIDAF - which estimates the percentage of family firms at around 60%.

The companies in the dataset are geographically distributed as shown in figure 2, with the majority of them located in the north of Italy. It is interesting to highlight the average revenues in year 2018 distributed by industry (figure 3) and by geographical location (Figure 4), from which it is evident the lower size of the selected companies belonging to the south of Italy.

Due to these reasons, we decided to include both the industry and the location as control variables in the regression models.
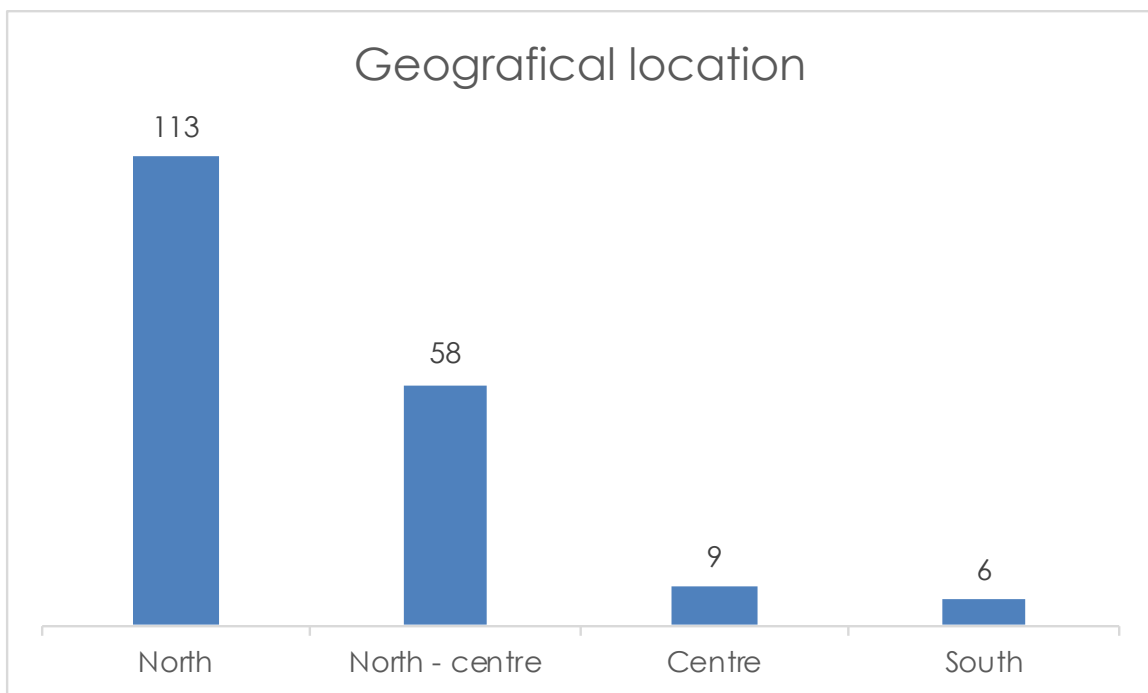
Figure 3 3 - Distribution by geographical location

Revenues by industry

€71.891.221

€51.164.005 €49.642.329

€46.170.897

€37.465.982

€30.553.598

80.000.000 €
70.000.000 €
60.000.000 €
50.000.000 €
40.000.000 €
30.000.000 €
20.000.000 €
10.000.000 €
- €

15 - Manufacture of leather and imitation leather goods | 21 - Manufacture of Basic Pharmaceutical Products and Pharmaceutical Preparations | 26 - Manufacture of Computer, Electronic and Optical Products; | 28 - Manufacture of machinery and equipment | 30 - Manufacture of other transport equipment | 32 - Other manufacturing industries

Figure 4 4 - Average revenues by industry

Revenues by location

49.541.486 € 50.908.326 €

40.342.163 €

33.382.780 €

60.000.000 €
50.000.000 €
40.000.000 €
30.000.000 €
20.000.000 €
10.000.000 €
- €

North | North - centre | Centre | South
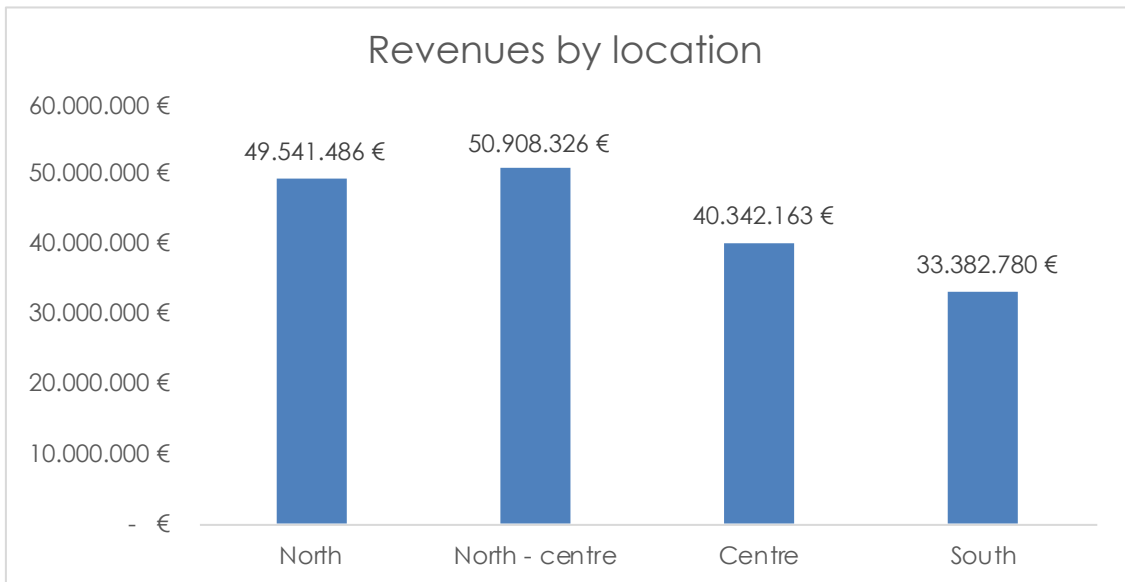
Figure 5 5 - Average revenues by location

5.1.2 Family firms sample

Regarding the sample with family companies only, it is important to underpin the main differences in the composition of the Board of Directors.

In particular the 88% of them have a family CEO with only 52% of them located withing an industrial district. The extremely high number of family firms with the family CEO demonstrates even more the dominant role of the traditional context in the sample of this analysis.

In addition, the percentage of family members increases when the companies are in the south of Italy (Figure 4) as well as the mean number of generations involved (Figure 5). For this reason, we decide to include also in this case the variables regarding the location and the industry as control variables in the regression models.

Figure 6 - Mean Percentage of family members in the BoD

Figure 7 – Average number of generations in the BoD

5.2 Regression models findings

In this paragraph the results regarding the regression models are presented from a statistical point of view, while the full theoretical and practical explanation is provided in 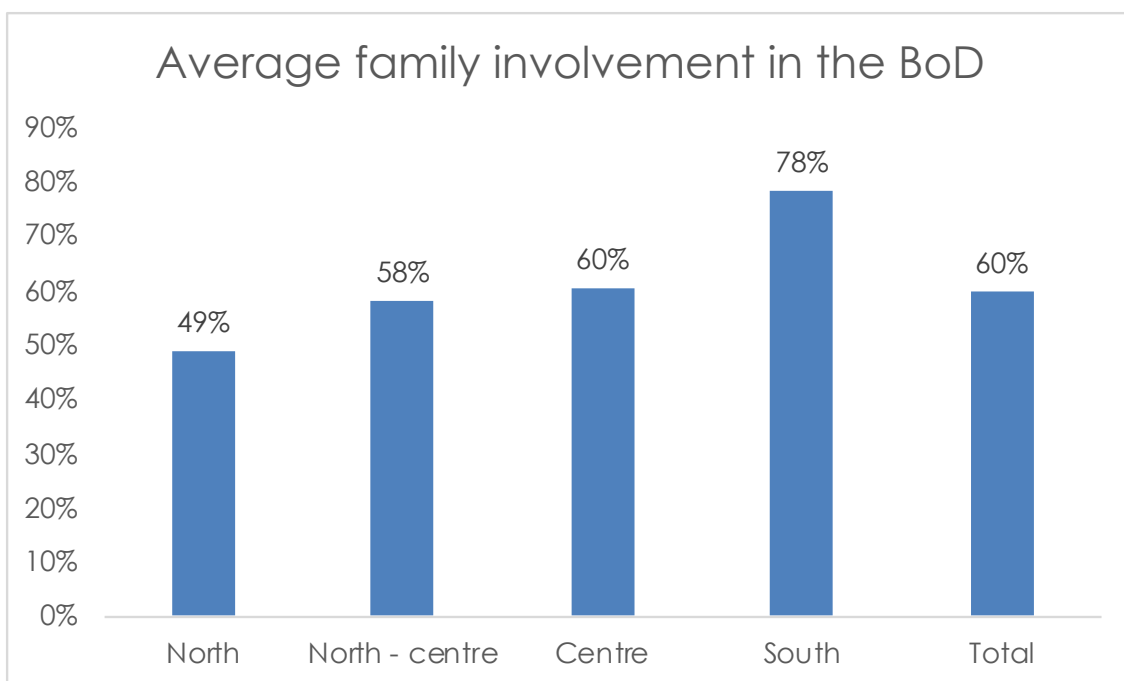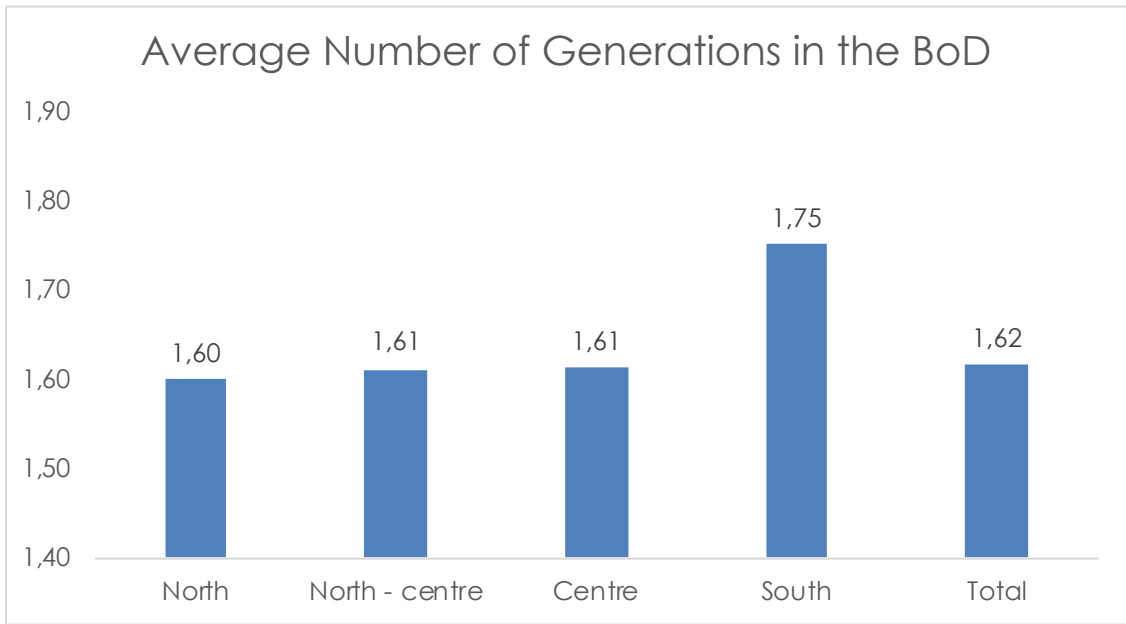the following chapter. In particular, the results are explained primary according to the magnitude of the coefficients (β) and its standardized value (Beta) used to make a better comparison among them, secondly according to the significance level.

The explanation is divided in 3 different parts: the first part describes the results of the model 1 and model 2, which analyse the differences in R&D investments and R&D conversion behaviours among family and non-family firms. The second part defines the results of model 3, model 4, model 5 and model 6, which focus on family firms only, going through the effects of sources of family firms heterogeneity regarding the Board of Directors composition, long termism and local embeddedness on R&D investments. The last part shows the results of model 7, model 8, model 9 and model 10, which investigate the effects on R&D conversion of the same sources of heterogeneity of family firms.

5.2.1 Different R&D investments and R&D conversion behaviours among family and non-family firms

Model 1 shows the results of the regression analysis of the relationship between family ownership and R&D investments. Consistently with our hypothesis (H1) the model shows a significant negative coefficient (β = -0,114), demonstrating the significant negative relationship with R&D investment due to family firms' general aversion to R&D investments. As expected, the relationship between R&D investments and Firms revenues is relevant and significant with a

coefficient $\beta = 0,549$, a standardized coefficient Beta $= 0,205$ and a p-value $< 0,05$. This value means that an increase of 1% of the revenues leads to an increase of the 0,54% of the R&D investments, showing the clear positive dependence of R&D investments on the size of the company. The adjusted R squared of the model is almost 30%, aligned with other results of the extant literature (example: Block, 2012, "R&D investments in family and founder firms: An agency perspective").

Differently, Model 2 shows the results of the analysis regarding R&D conversion. In this case, our Hypothesis H2 is only partially confirmed, due to the little magnitude of the coefficient $\beta = 0,053$ and a standardized coefficient of Beta $= 0,015$, which assumes a positive value as hypothesized, but it is quite low if compared to the other variables coefficients. In addition, the significance level shows a p-value higher than the threshold of 0,1. Hence, an interpretation of the coefficient is not meaningful. It is important to highlight the relevant and significance positive relationships with the Current ratio ($\beta = 0,826$; beta $= 0,167$; p-value $< 0,05$), and Age ($\beta = 0,436$; Beta $= 0,155$; p-value $< 0,05$), whose standardized coefficients are the highest among the other variables' ones.

These values mean that an increase of the 25% of the age, leads to an increase of 10% of the conversion ability of the firm and an increase of 10% of the current ratio leads to an increase of 8,2% of the conversion ability[7]. Table 3 synthetizes the results shown.

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[7] The formula used to calculate the value for the variable is:
% increase of the dependent variable = ((1 + % increase of the independent variable)$^\beta$ – 1) * 100

Table 3 - Results of the regression Analysis: Model 1;2

Variables	Model 1 Change in R&D investments		Model 2 Change in R&D conversion	
	β	Beta	β	Beta
Family Firms (H1; H2)	- ,114*	- ,034*	,053	,015
Control Variables				
Revenues	,549**	,205**	- ,087	- ,032
Employees	,227	,087	,269	,100
ROA	- ,029*	- ,092*	,027	,083
Current Ratio	- 1,002***	- ,208***	,826**	,167**
Age	- ,238	- ,087	,436**	,155**
Debt ratio	,004	,002	- ,212	- ,103
Total number of managers	,048**	,151**	- ,006	- ,018
Industry dummies (6 variables)	p = ,055		p = ,245	
Location dummies (4 variables)	p = ,017		p = ,558	
Sample size	186		186	
Adjusted R^2	,298		,178	
Durbin Watson test	1,57		1,65	

* = p-value < 0,1

** = p-value < 0,05

*** = p-value < 0,001

Industry reference: Ateco 28 - Manufacture of machinery and equipment

Location reference: North

5.2.2 Amount of R&D investments in Family firms

Model 3, model 4 and model 5 show the results of the regression analysis regarding the impact of the family composition of BoD, the long-term orientation and the local embeddedness respectively, on family firms R&D investments. According to our hypothesis, the percentage of family member in the BoD is negatively associated to R&D investments (H3a), with a relevant and significant coefficient $\beta = -0,751$, a standardized coefficient of Beta = -0,133 and a p-value < 0,1, which is among the highest in model 3. This value means that an increase of 1% of family members in the BoD, decreases by 0,18% the R&D investments. This result is also confirmed by model 6, which represents a robustness check of the effect, as all the explanatory variables are used in the model and the effect is not isolated.

Also the impact of family CEO (H3b) and the number of generations (H3c) are negatively related to R&D investments, as hypothesized. However, the magnitudes of the coefficients are lower than the one of the family involvement and the significances are not below the threshold level of p-value < 0,1, for these reasons the hypotheses are only partially confirmed and numerical interpretations are not meaningful.

A completely unexpected results is shown by model 4, where, opposingly to what hypothesized (H5), the long-term orientation negatively affects the R&D investments with a coefficient of $\beta = -0,254$. Even if the magnitude of the standardized coefficient (Beta = 0,083) is not among the highest, this effect is confirmed by model 6. Therefore, the contrasting results make us reject hypothesis 6, and possible explanations are discussed in the next chapter.

Model 5 shows the impact of the local embeddedness on R&D investments. In this case, the magnitude of the coefficient is extremely low ($\beta = -0,014$) and model 6, used to check the robustness of the effect, opposes the results of the previous model, showing a positive relationship ($\beta = 0,064$). Therefore, these contrasting results make us refuse hypothesis 7 (H7) showing the absence of a significant effect of local embeddedness on R&D investments.

It is remarkably relevant the role of the firm performances, measured with the ROA, which shows a relevant and significant negative effect on R&D investments (Model 6: $\beta = -0,052$; Beta $= -0,150$; p-value $< 0,05$). In particular, the effect shows that a decrease of 1% of the ROA, increase by 0,88% the R&D investments. This result is aligned with the myopic loss aversion framework, where it is shown how the investments in R&D strongly vary with variation of the company economic performances, in particular when economic results lower, then R&D investments increase, as demonstrated in the data of the models.

Another noticeably relationship is, as expected, the one with revenues, the highest among all the effects ($\beta = 0,956$; Beta $= 0,346$; p-value $< 0,001$) immediately followed by the current ratio ($\beta = -1,197$; Beta $= -0,251$; p-value $< 0,05$). These values show that an increase of 10% of the revenues, increases also by 9,54% the R&D investments, and an increase of 1% of the current ratio decreases by 1,19% the R&D investments.

The Adjusted R squared is always between 34% and 38%, demonstrating the good predictability of the models.

Table 4 synthesizes the results explained.

Table 4 - Results of the regression analysis for R&D investments: Model 3;4;5;6

Variables	Change in R&D investments							
	Model 3		Model 4		Model 5		Model 6	
	β	Beta	β	Beta	β	Beta	β	Beta
Explanatory variables								
Family member in the BoD (H3a)	- ,751*	- ,133*					- ,695*	- ,123*
Family CEO (H3b)	- ,519	- ,099					- ,504	- ,096
Family Generations in the BoD (H3c)	- ,112	- ,039					- ,145	- ,051
Long termism (H5)			- ,254	- ,083			- ,212	- ,069
Local embeddedness(H7)					- ,014	- ,004	,064	,019
Control Variables								
Revenues	1,013***	,367***	,930**	,337**	,989**	,359**	,956***	,346***
Employees	- ,229	- ,082	- ,094	- ,034	- ,166	- ,059	- ,172	- ,062
ROA	- ,061**	- ,176**	- ,046*	- ,132*	- ,057*	- ,163*	- ,052*	- ,150*
Current Ratio	- 1,240**	- ,260**	- 1,206**	- ,252**	- 1,258**	- ,263**	- 1,197**	- ,251**
Age	,035	,012	,084	,028	,075	,025	,041	,014
Debt ratio	,075	,035	,024	,011	,001	,000	,096	,045
Total number of managers	,034	,092	,054*	,148*	,056*	,153*	,035	,095
Industry dummies (6 variables)	p = ,059		p = ,044		p = ,034		p = ,079	
Location dummies (4 variables)	p = ,005		p = ,004		p = ,004		p = ,012	
Sample size	112		112		112		112	
Adjusted R^2	,377		,349		,343		,380	
Durbin Watson test	1,837		1,790		1,786		1,842	

* = p-value < 0,1

** = p-value < 0,05

*** = p-value < 0,001

Industry reference: Ateco 28 - Manufacture of machinery and equipment

Location reference: North

5.2.3 Causes of different R&D conversion in Family firms

Model 7, model 8 and model 9 show the results of the regression analysis regarding the impact on R&D conversion of the family composition of Board of Directors, the long-term orientation and the local embeddedness respectively, on family firms R&D conversion.

In contrast with our hypothesis, the results show that the effect of the composition of Board of Directors on R&D conversion is quite controversial. In fact, contrarily to what hypothesized, the percentage of family members in the Board of Directors (H4a) is negative associated to R&D conversion with a coefficient of $\beta = -0,257$ and a standardized coefficient of Beta $= -0,045$, as well as the number of generations involved in the Board of Directors (H4c), with a coefficient equals to $\beta = -0,140$. Even if the magnitude of the coefficients is lower than other variables' ones and the significance value is higher than the threshold of p-value $< 0,1$, these results show that an increase of the percentage of family members in the BoD decrease the ability to convert innovation input. The same negative results are confirmed also by model 10, which takes into account all the independent variables, avoiding the isolation of the effects. For these reasons we refuse hypothesis 4a and hypothesis 4c; a theoretical explanation is provided in the next chapter.

Instead we can confirm Hypothesis 4b, since, in accordance with our hypothesis, there is a relevant and significant effect of the presence of a family CEO on R&D conversion as the coefficient is $\beta = 0,481$, the standardized coefficient is Beta $= -0,091$ and the p-value $< 0,1$. This means that the presence of a family CEO leads to an increase of the 78,8% of the innovation ability.

The result is confirmed also by model 10, where the standardize coefficient is among the highest (Beta = 0,085).

Aligned to our hypothesis 6, also the long termism has a positive impact on R&D conversion, with a magnitude $\beta = 0,305$. This result, shown by model 8 and confirmed also by model 10, makes us accept the hypothesis 6 (H6).

Lastly, model 9 shows the effect of local embeddedness on R&D conversion. Despite we hypothesized a positive impact, results do not support our hypothesis (H8) since the coefficient is extremely little positive, and in model 10, used as a check for robustness of the single and isolated effects, the relationship becomes negative. For this reason, we refuse hypothesis 8, as local embeddedness does not show any impact on R&D conversion. Also in this case, theoretical discussions are provided in the next chapter.

It is worth noticing the positive and relevant relationship of R&D conversion with firm performances (Model 10: $\beta = 0,062$; Beta = 0,176; p-value < 0,05), measured with ROA, which shows the increased firm ability to innovate when performances increase.

The variance explained by the models is always higher than 22,8%, showing a reduction if compared to the models in table 3 and table 4; however, these Adjusted R squared values are still aligned with the standards in existing literature.

To conclude, table 5 sums up the results explained.

Table 5 - Results of the regression analysis for R&D conversion: Model 7;8;9;10

Variables	Change in R&D conversion							
	Model 7		Model 8		Model 9		Model 10	
	β	Beta	β	Beta	β	Beta	β	Beta
Explanatory variables								
Family member in the BoD (H4a)	- ,257	- ,045					- ,333	- ,058
Family CEO (H4b)	,481*	,091*					,451*	,085*
Family Generations in the BoD (H4c)	- ,140	- ,048					- ,094	- ,032
Long termism (H6)			,305	,099			,297	,096
Local embeddedness (H8)					,012	,004	- ,048	- ,014
Control Variables								
Revenues	- ,355	- ,127	- ,268	- ,096	- ,340	- ,122	- ,274	- ,098
Employees	- ,003	- ,001	- ,041	- ,015	,046	,016	- ,084	- ,030
ROA	,075**	,212**	,056*	,160*	,069**	,197**	,062**	,176**
Current Ratio	,751	,155	,739	,153	,802	,166	,693	,143
Age	,371	,123	,382*	,127*	,393*	,130*	,361	,119
Debt ratio	- ,279	- ,129	- ,294	- ,136	- ,266	- ,123	- ,305	- ,141
Total number of managers	,039	,105	,034	,092	,032	,085	,038	,102
Industry dummies (6 variables)	p = ,490		p = ,336		p = ,334		p = ,566	
Location dummies (4 variables)	p = ,372		p = ,488		p = ,378		p = ,458	
Sample size	112		112		112		112	
Adjusted R^2	,235		,236		,228,		,241	
Durbin Watson test	1,963		1,947		1,954		1,955	

* = p-value < 0,1

** = p-value < 0,05

*** = p-value < 0,001

Industry reference: Ateco 28 - Manufacture of machinery and equipment

Location reference: North

6. DISCUSSION

The aim of this chapter is to provide a comprehensive explanation of the results seen in the previous section, in order to highlight the theoretical contributions to extant literature given by this dissertation, together with the managerial implications.

6.1 Discussion and theoretical contributions

Firstly, this paragraph focuses on the main outcomes of the effect of family ownership on the ability – willingness innovation paradox, with references to model 1 and model 2. Then, the focal point moves only to the innovative behaviours of family firms, analysing the impact of the independent variables (Composition of the Board of Directors; Long termism; Local embeddedness), one by one, both on innovation willingness and on innovation ability, to provide a full explanation of the effect of each variable on innovation.

### 6.1.1 The effect of family ownership on innovation in a traditional and innovative context

The first relevant contribution to extant literature refers to the impact of family ownership on R&D investments. As hypothesized in H1 and confirmed in model 1, family ownership negatively impacts on the amount of R&D expenses of companies in a traditional and innovative context. This negative relationship between family ownership and innovation investments is common in family business literature, which attribute to family firms a lower willingness to invest in R&D, mainly for their tendency to focus on the preservation of the socio-

emotional wealth rather than on economic goals, for their priority in maintaining control and for their higher sensitivity to investments (Chen & Hsu, 2014; Duran et al, 2016), which results into a greater aversion to risky decisions and a reduction in R&D investments. These motivations are still valid and prevail in our specific context. In fact, the innovativeness and the traditionality of the context do not overturn the risk aversion behaviour of family firms, who still invest less resources in R&D regardless the high investments of the industry.

A different explanation should be given when referring to R&D conversion. In accordance with our hypothesis H2, there is a little positive relationship between family ownership and innovation conversion. Thereby we tend to claim that family firms in a traditional and innovative context still maintain their well-known better ability to innovate when compared to non-family firms, however this effect is not as relevant as we expected according to other results shown in previous literature (Duran et al, 2016). For these reasons, while the lower willingness of family firms is assured also in this context, the higher ability is not satisfied. The reasons behind this result can be definitely attributable to the traditional context. Extant literature claims that features like the higher commitment of family members to monitor managers and the ability to create long term relationships with stakeholders, are responsible to incentive and promote the conversion of innovation input (Duran et al. 2016), and family firms, who intrinsically own these features (Berrone, Cruz, Gomex-Mejia, 2012), were therefore considered to better use them for innovation conversion. However, in this traditional context, the long-term relationships are not in the hands of family firms only anymore. This is due to the fact that non-family firms, to keep their competitive advantage, have helped to develop the elements of tradition of the

industry and have learnt to use them. This requires, by definition, a "transmission of knowledge through time and across communities" (Hibbert & Huxham, 2011), hence the creation of long-term relationships not only in family firms, but also in non-family firms. To confirm this behaviour that set importance on long term relationships to innovate, results show the relevant and significant positive relationship between the 'Age' of the firms and the innovation conversion ($\beta = 0{,}436$; p-value $< 0{,}05$). In particular it is showed that an increase of 25% of the firms age results in a 10% increase of the conversion ability. This means that the long-term relationships, are achieved through years and are increased with the age, the experience and the knowledge of the firm, and that non-family firms, if stimulated, are able to develop such characteristics. This result opens a set of possible further research that can be focused on the analysis of specific elements that favour the transmission of tradition in traditional contexts.

Figure 8 – Family Ownership relationship with R&D investments and R&D conversion
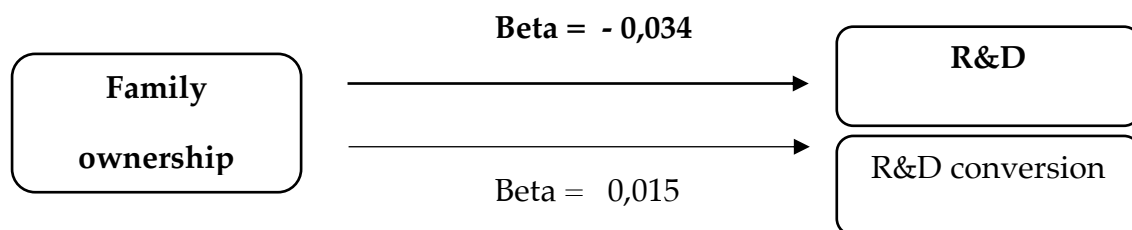
Therefore, according to the previous explanations, the innovation paradox in family firms in this specific context, is only partially confirmed since, while the lower innovation willingness of family firms is relevant and theoretically clear, the higher innovation conversion can undergo some behaviours whose explanation is still missing in extant literature. For example, if 'Firm age'

substitutes the family ownership advantages in innovation conversion, this gives non-family firms the possibility to increase their level of conversion ability.

In this regard, the results of the next regression models of this dissertation, which focus on the evaluation of the impact of the independent variables (Composition of the BoD; Long termism; Local Embeddedness) on family firms' innovation investments and innovation conversion, can be helpful to explain part of the heterogeneity of family firms regarding the innovation behaviours in this specific context, and disentangle these no certain results provided by family ownership.

6.1.2 The impact of the composition of the Board of Directors on family firms' innovation behaviours

The first dimension discussed is, as shown in the previous chapters, the composition of the board of directors. As regards for R&D investments, all the hypotheses developed on the effect of the family on R&D have been confirmed. In fact, from the regression models, we can conclude that the traditional context increases even more the interests of family members to the maintenance of their socioemotional wealth, which leads to a higher risk aversion when the percentage of family members is high. An increase of 1% of the family involvement, reduces by 0,18% the R&D investments. Unfortunately, the higher possibility of family members to access to the external knowledge and to the past elements of tradition of the context, do not reduce or mitigate the risk aversion behaviour.

The same negative effect is provided by the family CEO. As expected in Hypothesis 3b, Family CEO confirms to be more sensitive to risky investments if compared to a non-family one, as the coefficient has a magnitude of $\beta = -0,519$.

Even in this case, the family CEO is incentivised in following and satisfying both its own and the family goals. Hence the family CEO focuses on the preservation of its wealth, which is usually made of few companies (Anderson et al., 2003), on the maintenance of control over the firm and on the protection of the socio-emotional wealth. Thanks to its high position, the family CEO can strongly determine the culture, the processes and the resources allocation of the company to innovation investments. For this reason, its presence can significantly affect in a negative way the innovation investments (H3b).

Regarding the number of generations, the effect is not clear and well defined. Despite we hypothesize a negative relationship (H3c), our results seem to confirm the contrasting opinions of literature on this topic due to the possible effects of the Board of Directors heterogeneity on innovation. In fact, two different behaviours that lead to contrasting results happen in family firms in the traditional and innovative context. From one side, the higher number of generations in the Board of Directors, which translates into a higher heterogeneity and different perspectives (Postrel, 2002), stimulates and encourages the generation to have various ideas and to make innovative decisions. From the other side, this heterogeneity makes it more difficult to create a strategic consensus and a common perspective (Hambrick, Cho & Chen; 1996), generating internal conflicts. Hence, this conflictual situation leaves as a unique reasonable solution strategy the preservation of the status quo, which of course does not require information and opinions exchange, hence it eliminates conflicts. The establishment of this comfort zone results in a decrease of the risk propension (Sciascia, Mazzola & Chirico; 2013) and in the consideration of

innovation as a threat (Kellermanns & Eddleston, 2006), thus leading to a decrease of innovation investments.

According to this, the low negative coefficient of the model demonstrates this double and opposed influence of the number of generations in the board of directors on R&D investments, with a prevalence of the negative effects and the acceptance of the status quo as a solution to the high internal conflicts.

Thereby, as we expected, we can generally confirm that even in a traditional and innovative context, family in the Board of Directors, in its multifaceted declinations (Percentage of family members, Family CEO and number of family generations), negatively influences the willingness of family firms to innovate, due to their strong risk aversion.

When referring to R&D conversion, the situation is ambivalent. From the previous results about the family ownership effect, we can already understand that the role of the family dimension only partially increases the ability to innovate. These uncommon results suggest that there are some mechanisms, specific of this traditional and innovative context, that are unknown and in contrast with extant literature. Our results show that the family involvement in the composition of the Board of Director plays a relevant role to disentangle the identification of these mechanisms.

The first dimension to be discussed is the percentage of family members in the Board of Directors which, in contrast with what hypothesized (H4a), is negatively associated to innovation ability.

This uncommon result proves evidence of the determinant role of the traditional context in R&D conversion, which fosters a series of different mechanisms that overturn the expected results. In particular, it is the higher ability of family firms

to create long-term and trust-based relationships with internal and external stakeholders, leading to a better ability to accumulate implicit or tacit knowledge among the employees (Almeida, Song & Grant, 2002) and to a facilitated access to old and external knowledge, that is mitigated and overwhelmed by other dynamics boosted by the traditional context.

The first relevant aspect that explains why in traditional context the percentage of family members in the Board of Directors negatively impacts on R&D conversion refers to the higher power distance perceived by employees. It is known that an increased percentage of the family members in the Board of Directors is perceived from the employees as if the control of the firm is in the hands of family only. This increases the sensation of higher power distance between family and non-family managers, which results in a reduced incentive for lower hierarchical levels to contribute to knowledge exploitation, lowering the realized absorptive capacity (Kotlar et al., 2020). Of course, in a traditional context, the ability to share, use and exploit past and external knowledge to transform it into valuable output, is essential to successfully innovate, as the past knowledge contains all those elements of tradition (Hibbert and Huxham, 2011), that are difficult to imitate, and contributes to the firm competitive advantage (Barney 1991; Kanter, 1995). Therefore, a decrease of the ability to use and transform knowledge and tradition, converts into a significant reduction in the innovation ability.

The second explanatory aspect refers to the so called 'Nepotism', which consists in the tendency of family firms in hiring family members (Webb, Ketchen, & Ireland, 2010). In fact, the higher percentage of family members, which means a high nepotism effect, leads to a more homogenous composition of the board of

directors that results in the lack of competences needed to orchestrate resources and to successfully innovate.

Last, the number of familiar conflicts, boosted from the higher percentage of family members, increases the agency costs, reducing the firm ability to effectively innovate.

Our dissertation therefore contributes to extant literature revealing that in traditional context the family percentage in the Board of Directors is negatively associated to R&D conversion, due to three main behaviours that are: power distance perception, nepotism effect and familiar conflicts.

The same kind of discussion should be given for the impact of the number of generations in the Board of Directors on R&D conversion, since the results, opposingly to our hypothesis (H4c) show a weak negative relationship between the two variables. Even in this case, the expected stimulating and constructing conflicts between the heterogeneous group of the Board of Directors that should lead to a higher ability to innovate, are overturned. In fact, the risk that these conflicts lead to an approach that aims at the maintenance of the status quo to avoid discussions, becomes reality in traditional context family firms. This results into the lower ability to innovate and exploit the element of tradition.

By contrast, family CEO highlights a positive relationship with innovation conversion, which is aligned to our hypothesis (H4b). In fact, the superior ability and knowledge of the family CEO (Polanyi, 1973; Nonaka & Takeuchi, 1995) can be exploited by all the organization to better orchestrate resources, without the risk of double side and contrasting effect.

Therefore, the negative results obtained from the relationship between the percentage of family members and the number of generations in the Board of

Directors, fully explain the reasons why family ownership is not significantly and positively associated to R&D conversion. In fact, while in different contexts these two dimensions provide a positive contribution to innovation ability, in traditional context their contribution is negative, hence the mechanisms within family firms are more complex and controversial as there are some dimensions that provide a positive effect, while other a negative one. Thereby, the analysis of family presence in the board of directors is relevant to better understand the results of model 2, which shows that there is little significance of family ownership association with R&D investments.

6.1.3 The impact of long termism on family firms' innovation behaviours

Another relevant dimension that impacts on the innovation ability and on the willingness to innovate, is the family firms' long termism. Since usually family firms are seen as long-term oriented companies, which aim at preserving the business in the long term to pass it to the future generations, we expected a positive impact on R&D investments (H5), as the increase of the long termism proxy, should increase also the long-term orientation and the activities to achieve these results. However, our totally unexpected results proved a negative relationship between the long termism and the innovation investment activity. This means that a propension to long termism, negatively affects the risk propension and the innovation input.

To explain this effect, we need to refer to a literature stream that relates risk attitude to the variation of the firm performances (Patel & Chrisman, 2012; Kotlar et al., 2014). Patel and Chrisman, in the myopic loss aversion framework (2012) explain that, in family firms, an increase in R&D investments happens when the firm performances decrease.

This theoretical explanation integrates and justifies our results, which shows an increase of 0,88% of R&D investment when the ROA decreases by 1%. In fact, both model 4 and model 6, the models that contain the long termism variable in the independent variables, show the significant and relevant negative relationship with the control variable accounting for firm past performance: ROA 2018 (%). Therefore, it is proved evidence that the risk aversion and the amount of R&D investments depend on the variability of firm's performance, hence a long-term orientation, if supported by good economic results, reduces the willingness to invest in R&D by 0,88% for each ROA percentage point, as there is no need to invest in new and uncertain assets.

Another interpretation could also describe the results as a limit of the model, which, according to the goal of the dissertation, uses only one single proxy of long termism. Further developments might analyse this relationship through different proxies of long termism and R&D investments, to better understand the reasons behind this result.

Regarding R&D conversion, our hypothesis (H6), which proposes a positive relationship between long termism and R&D conversion, is confirmed by results. In particular, a long-term orientation increases the willingness to create long-term relationships with internal and external stakeholders. The creation of better relationships with customers and suppliers, for instance, as explained in other paragraphs, provides the company with resources and knowledge that are not easily available on the market (Rothamaermel & Hess, 2007), which can be used to innovate better and successfully.

The traditional context strengthens the importance and the advantages that can be achieved through long term relationships, since these favour the transfer and

the acquisition of tacit and implicit knowledge (Almeida, Song & Grant, 2002), which contains all the essential elements of tradition to guarantee the competitive advantage (Barney 1991; Kanter, 1995).

6.1.4 The impact of local embeddedness on family firms' innovation behaviours

The last dimension regards the impact of local embeddedness on innovation behaviours.

Despite we hypothesized its positive impact both on R&D investments (H7) and on R&D conversion (H8), results proof the absence of any relevant relationships between these two dimensions. The affiliation to a complex and inextricable network of relations and cultural heritage that affects both professional and informal relationship (Becattini, 1987), apparently seems not to provide any impact on innovation. The same happens for localized external networks which, despite being able to provide resources such as a stable pool of skilled workers, the access to low production services costs, the possibility to use immediately and easily sophisticated machineries, the access to common organizational methods or to innovative ideas and the opportunities for formal or informal linkage with other companies, do not impact on the ability to innovate.

A reasonable explanation is once again attributable to the traditional context. It is possible that the exploitation of tacit knowledge and the access to specific required resources depends on other elements of local embeddedness and tradition, which is not the presence in an industrial district. These results open the possibilities to further research to investigate the relationships among innovation behaviours and different sources of local embeddedness in the Italian scenario. For instance, it could be investigated the relationship with the proximity to innovation districts such as the 'Kilometro Rosso Innovation

District', 'MIND' and others. It should also be considered that in the last two years, relationships in professional environments have undergone a strong change that untie them from the place in which they are developed. Many digital tools recently adopted, allow us to create relationship without reliance on the physical environment. Not only the empowered videocall instruments, but mostly the new possibilities granted by the tools of Industry 4.0, such as the 'digital twin', allow to physically replicate the working scenario and learn the specific competences from other professionals which are placed in a different location. This could radically transform the concept of local embeddedness that need to consider also the digital environment as a place to create expanded relationship and networks.

6.2 Managerial implications

The outcomes of this research have relevant consequences also for managers. The important investments that have been carried out in this recent period, both by public and private entities, to foster innovation related to the digital and sustainable transformation, must be fitted and properly exploited by the Italian family companies (The majority of Italian companies: 60%), which often have to deal with traditionality as well. As tradition is still perceived by many managers as an obstacle to innovation, this study wants to overturn this prejudice and support with empirical evidence the paradigm of Innovation Through Tradition, in which it is considered as a value to successfully innovate (De Massis et al, 2016).

Therefore, this research identifies behaviours and endogenous features that can be leveraged to successfully innovate and the ones that should be avoided or modified.

The primary implication for managers that work in or with family firms, refers to the confirmed aversion of family firms to risky decisions and investments, also in a context characterized by high innovativeness and tradition. Managers have to be aware of the family firm's tendency to prioritize family goals and to preserve socio-emotional wealth, as traditionality doesn't help to smooth this behaviour.

The second important outcomes that managers must consider in the resource orchestration to successfully innovate, is the perceived power distance caused by the percentage of family members and the number of generations in the board of directors. This demotivates lower hierarchical level employees, who are less incentive, to exchange the traditional elements of knowledge, leading to a

reduced conversion of innovation output. Therefore, when the amount of family members and the number of generations in the family board are high, managers should be aware of this risk and try to not concentrate the decisional power only in the hands of family members.

The last implication refers to the pervasive role of tradition in this context, that extends its opportunities not only to family firms, but to non-family firms as well. In fact, traditionality can be exploited also by non-family companies, through the development of long-term relationships with customers, suppliers and internal employees. Therefore it is important for non-family companies operating in a traditional environment, to strategically focus on the maintenance and development of some strategic long-term relationships that grant the access to specific sources of external knowledge and internal tacit knowledge.

7. CONCLUSION

To conclude, our study extends the knowledge about the complex world of innovation behaviours in family firms. In particular, our goal to provide empirical evidence regarding the ability – willingness paradox in family companies where the role of tradition is relevant, supports and extends the recent stream of study of innovation through tradition. Through the outcomes of the regression models, we provide better understanding of the role of tradition in family companies and how three important aspect of family firms heterogeneity, such as family involvement in the Board of Directors, long termism and local embeddedness intercept the traditionality of the context to impact on innovation. The first main contribution sheds light on the topic of ability – willingness paradox of family firms. In particular, it is found out that the role of tradition smooths these contrasting behaviours since family firms confirm to be more risk averse, but they show not to be better converter of the innovation resources used, as they were supposed to. Thereby, we highlight new opportunities for non-family companies as they demonstrate the ability to catch the potentialities of tradition. These findings are significant also for the Innovation Through Tradition stream, as they prove evidence that tradition is not reserved to family firms, but to other companies as well, which can be analysed to identify unknown relationships or best practices.

The second contribution supports the research on the innovation heterogeneity in family firms. In particular, the need to investigate family firms behaviour in specific contexts to understand how it affects known relationship, was identified by some researchers (Duran et al., 2016; Patel & Chrisman, 2012). In this regard,

our research, which focused on a traditional and innovative context, identifies different relevant outcomes that are justified by the role of tradition. Concerning the composition of the Board of Directors, there is still a high prevalence of family members to maintain the control of the firm and reduce risky investments, while an unexpected result appears when considering innovation conversion. In fact, there is a negative impact of the family members in the board of directors, as they increase the perceived control distance between family and non-family members, which decreases the exchange of knowledge and the ability to convert innovation inputs. Therefore, in this specific context, tradition does not advantage family members in the innovation conversion.

A relevant outcome derives also from the analysis of the impact of local embeddedness on family firms innovation heterogeneity. In fact, we found out that there is no influence of the presence of industrial districts on innovation. The sharp increase in industry 4.0 tools adoption may suggest a rethink of this topic, as the digital environment is becoming part of our working routines and further research might better investigate this new trend.

This limitation, together with the others of our research is presented in the following paragraph.

7.1 Limitations

This research however presents some limitations, due to different reasons, that are presented below. It is clear that the most important restrictions that the work has encountered are due to the data provided by the AIDA and ORBIS databases. In fact, in several cases these data were missing or inaccurate. For example, as regards the R&D expenditures, 1152 companies of the total 1568 did not have

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such data, so that we have also tried to call five of these firms to understand the reasons behind such behaviour. They answered us that this type of information is usually included in other budget items, such as salaries and personnel costs. Moreover, the familiarity analysis could present some imperfections, since, as previously explained in chapter 4, we used the data from ORBIS and AIDA databases and then we compared them with information of the companies' websites, but sometimes it was still difficult to identify safely the members of the family. Because of the great number of companies (1568) we were not able to contact them directly and since we only had few personal information, we were no able to do a further check using social networks. Such possible imprecisions could be present also in the variables of family involvement (*the Percentage of family members, the Family CEO, the Number of generations*), because the same methodology was used for these variables. Another limitation caused by the inaccuracy of data is that related to the control variable of *Firm Age,* in fact some companies have been reorganized changing corporate structure or have been merged with other companies over time. In these cases, the databases consider as founding date the one on which the companies were reorganized, while everything else of their previous history is not taken into consideration, leading to some possible errors. Missing data have led to the conduction of a regression analysis with a sample of 186 companies, without outliers, and maybe this limited number of companies explains the low significance of certain results. The last limitation was the inability to carry out a robustness check, since the data available for the companies selected, were not enough to find other variables related to innovation investments and innovation conversion to be used as dependent ones in this analysis.

In conclusion, it is also important to consider that our research has been developed to study the behaviours of Italian companies, which operate in Italy and that also have Italian GUO (Global Ultimate Owner). Therefore, these results could not be valid in foreign contexts, as well as the model, since the methods used to identify the traditional sectors (Industrial Districts, Golden Power) and to measure some variables (Local Embeddedness linked to the presence of Industrial Districts), are characteristic of the Italian business context.

7.2 Suggestions for future research

According to the outcomes of the study and the limitations specified in the previous paragraph, this section aims to provide some recommendations for further research, identifying related topics that deserve to be explored and giving some suggestions for the analysis of this field of study.

As first thing the modalities for the sample selection presents arguments that could be interesting to further investigate such as the methods to find the traditional sectors. In fact, we have used four measures (Presence of Primates, Export Shares, Presence of Industrial Districts and Golden Power) as proxies to intercept the importance of the Italian tradition, hence we strongly suggest to use other different measures to consider the tradition and analysing if and how the sample changes, deserves, for us, further consideration. Another point of interest is related to the enlarging of the sample, indeed respect to the total 99 sectors of the ATECO code, we have taken into consideration only 6 of them, therefore other innovative and traditional sectors could be analysed, as well as it may be interesting to see the difference in the relationship with innovation between companies belonging to sectors both innovative and traditional and firms which

are included in sectors only traditional or only innovative. This last one may be particularly of interest, because the tertiary macro sector, the one related to the services, does not incorporate traditional sectors but however has high innovativeness, so a comparison between the primary and secondary macro sector with the tertiary can be very interesting, also because the product innovation of the first is compared to the service innovation of the second.

Moreover, it would also be important to analyse in a different way the innovation, indeed in addition to the innovation input, measured with R&D expenditures, and the conversion of innovation input, with the Number of granted publications divided by the R&D, also the innovation output, using for example the Value of the Patents may be of particular interest. We did not analyse it as dependent variable because, otherwise, the sample would have been further reduced since this information was not available for many of the companies selected.

Furthermore, other attractive topics for future research can be related to how to measure the family firms' heterogeneity. The family involvement can be, for example, structured considering which is the generation of the family CEO that runs the company, to see how the change of this variables affects innovation. While measures for family involvement have been largely studied in the literature, what we think is still little studied is how to measure the Long-Term Orientation and the Local Embeddedness; in fact, we have used the Capex over Depreciation and the Presence of Industrial Districts, but maybe using different proxies the results of the analysis may change, as well as considering also the role of the digital environment in the measure.

What could be interesting from the point of view of the analysis, is to measure, also for the non-family firms, the effects of a Long-Term Orientation or of the Presence in an Industrial District on innovation, with the aim of understanding if these elements affect family and non-family organizations in the same way.

Even the outcomes of the analysis provide some insights for future research, indeed the effect of family ownership on the conversion, lower than expected, opens a set of possible questions, that can be investigated focusing on the identification of those specific elements that favour the transmission of tradition in traditional contexts both for family and non-family firms. Moreover, also the results of the variable of Local Embeddedness deserve further investigations, not only about the use of other proxies, like innovation districts, but also some research on the recent effect of digitalization should be undertaken, to properly understand the consequences on the companies' embeddedness within the territory and the working environment.

In this regard, we hope that this study will inspire other scholars to further investigate the complex dynamics of innovation of family firms in a traditional environment to extend the findings of this research.

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