

A Work Project, presented as part of the requirements for the Award of a Master's degree in  
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**The Relationship between Cash Conversion Cycle and Profitability in Italian  
Companies.**

**A Comparison between Family and Non-Family Businesses.**

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## **Abstract**

Academic research agrees on the outperforming profitability and the closer relationship with suppliers and customers, attributable to Family Business (FBs) compared to Non-FBs. This Work Project is aimed at understanding whether these characteristics still exist in Italian listed manufacturing FBs. Furthermore, this paper investigates how the differences in Cash Conversion Cycle components between FBs and Non-FBs impact profitability. Our findings suggest that FBs generate a higher Gross Sales Margin than Non-FBs by taking advantage of their relationship with suppliers. Specifically, FBs obtain lower input prices and longer payables periods than Non-FBs, while reducing variable costs through a longer inventory turnover.

**Key Words:** Family businesses, Cash Conversion Cycle, Profitability, Gross Margin, Days Sales Outstanding, Days Inventory Outstanding, Days Payables Outstanding, Debt-to-Equity

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*“Italian Capitalism is largely a family affair”<sup>1</sup>*

## **1. Introduction**

Family Businesses (FBs) represent the backbone of the Italian economy: one company out of three listed in the main Italian index – the FTSE MIB – has a family as its controlling shareholder, while the remaining two are either state-owned or banks<sup>2</sup>. As of 2018, FBs accounted for 65.6% of the total Italian companies with sales above €20mln<sup>3</sup>, representing 70% of the total employment and contributing circa 80% to the Italian GDP<sup>4</sup>.

However, the importance of FBs for the Italian economy does not only lie in their quantity, but rather in their characteristics. Numerous studies find the corporate governance characteristics stemming from the presence of a family in the company to be source of competitive advantage when compared to Non-FBs (Miller, Le Breton-Miller and Scholnick, 2008). The identification of the family with the firm leads to a better understanding of the business (Anderson and Reeb, 2003) and a higher risk aversion, justified by the will to pass on the business to future generations (Dieguez Soto, Lopez Delgado and Rojo Ramirez, 2014; Machek, Hnilica and Kolouchová, 2015). As a result of that, FBs operate with less managerial myopia and are less biased towards short-term goals. Moreover, due to these characteristics, they are particularly appreciated business counterparties for external stakeholders (suppliers, customers, banks) who grant them more favorable conditions (Varaldo, Dalli, Resciniti & Tunisini, 2009; Miller et al., 2008).

From a financial perspective, the literature finds FBs’ corporate governance approach to translate into a higher profitability (Anderson and Reeb, 2003; Allouche, Amann and Jausaud 2008) and a more prudential liquidity management (Thompson, Lu-Andrews and Liang, 2016;

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<sup>1</sup> Sanderson Rachel. 2019. “Corporate Italy Keeps It in the Family”. <https://www.ft.com/content/e80b8172-f5af-11e9-a79c-bc9acae3b654>

<sup>2</sup> Sanderson Rachel. 2019. “Corporate Italy Keeps It in the Family”. <https://www.ft.com/content/e80b8172-f5af-11e9-a79c-bc9acae3b654>

<sup>3</sup> XII Osservatorio AUB, 2021. <https://www.aidaf.it/wp-content/uploads/2021/01/26/Presentazione-XII-Osservatorio-AUB.pdf>.

<sup>4</sup> Refer to AIDAF – Associazione Italiana delle Aziende Familiari, 2021. <https://www.aidaf.it/aidaf/le-imprese-familiari/>.

Culasso, Broccardo and Giacosa, 2012). However, to the best of our knowledge, little regard has been given by research to the Cash Conversion Cycle (CCC) of FBs. Yet, previous literature has demonstrated CCC (Richards and Laughlin, 1980) is a powerful tool to assess the liquidity characteristics of FBs in the context of their operations and it is likely to have an impact on the possible differences in profitability between FBs and Non-FBs<sup>5</sup>. Hence, this Work Project sets two main objectives: 1) to study the differences in profitability and CCC and its components between FBs and Non-FBs; 2) to assess how, and to what extent, CCC impacts such differences in profitability.

The Work Project proceeds as follows: section 2 exposes the key concepts related to FBs, CCC and Profitability. Section 3 reviews the literature about FBs' profitability and Working Capital Management (WCM). Section 4 introduces the research questions (RQs) along with the statistical tools of the analysis and subsequently describes data collection and final sample. Section 5 presents and discusses the results. Section 6 summarizes the conclusions and the recommendations to managers. Lastly, section 7 presents the limitations of the study and gives cues for future research.

## **2. Key Concepts and Theoretical Background**

### *2.1 Family Business*

*“Defining a family business is indeed the first and most difficult challenge family business researchers must face”*. With these words, in 1989, Handler was one of the first to contribute to the heated debate regarding how family businesses should be defined. Since then, the challenge has been faced by many researchers, but no unanimous identification has emerged as yet. Nevertheless, a comprehensive definition of FBs is strictly linked to their corporate governance characteristics, which can be described according to three main frameworks: 1) Resource-Based View; 2) Agency Theory; 3) Stewardship Theory. The Resource-Based View

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<sup>5</sup> A comprehensive table of previous literature is presented in appendices 4.1 and 4.2.

describes FBs as the complex interaction between the family - representing the history and the tradition; the business entity – representing the mean of wealth generation and the family members – representing the skills, the interest, and the life-stage of the family (Habbershon, Williams, and MacMillan, 2003). Agency Theory, argues that the strong involvement of family members in the firm potentially decreases the risk of opportunistic behaviors and favors the alignment of interests, eventually leading to business continuity (Fama and Jensen, 1983). Finally, Stewardship Theory describes FBs as organizational forms that go beyond the mere monetary realization leading to corporate longevity and favorable relations with stakeholders (Miller, Le Breton-Miller, & Scholnick 2008). These characteristics may anticipate differences between FBs and Non-FBs regarding Profitability and CCC. The definition of FBs assumed by this Work Project pivots on the level of control that a family can exercise over a company. It will be discussed in further details in section 4.3.

## 2.2 Profitability

Past literature has shown that the peculiar characteristics of FBs have an impact on their level of profitability. In this study, profitability is proxied by Return on Assets (ROA), calculated as follows:  $ROA = \frac{EBIT}{Total\ Assets}$ . The main reason for this choice lies in the fact that ROA can be described as the “*continuous range of combinations*” (Wild, John J., 2006, p. 436) of three drivers:

$$ROA = \frac{Gross\ Profit}{Total\ Sales} \times \frac{EBIT}{Gross\ Profit} \times \frac{Total\ Sales}{Total\ Assets} \quad [1]$$

The first component is the Gross Sales Margin (GSM) and represents the profit margin available after variable costs are covered. The second component measures the Operating Risk (OR) of the company and shows the impact of fixed costs on ROA. The latter is the Asset Turnover (AT) and evaluates “*the intensity with which a company utilizes its assets*” in order to generate earnings (Wild, Subramanyam and Bowen, 2006, p.438). While considering ROA is useful to evaluate the overall profitability, an analysis of its breakdown is pivotal to understand the

contribution of each ROA driver to the overall ROA and how they may differ between FBs and Non-FBs.

Besides ROA, this study will particularly focus on the component GSM, as its numerator is the algebraic subtraction of sale prices collected from customers and input prices paid to suppliers (Cost of Goods Sold – COGS):

$$GSM = \frac{Total\ Sales - COGS}{Total\ Sales} \quad [2]$$

therefore, it is a good metric to verify whether FBs are able to profit from the “long-term associations” (Miller, Le Breton-Miller, 2006) with those two stakeholders.

### 2.3 Cash Conversion Cycle

Corporate liquidity can be assessed with two different approaches: static and dynamic (Farris and Hutchison, 2002; Moss and Stine, 1993). The former relies on balance sheet data solely and the working capital ratios (such as current ratio, cash ratio etc.) to study liquidity in a specific point in time. The latter accounts for a firm’s current liquidity position based on its operations and uses both income statement and balance sheet data. The analytical tool of the dynamic approach is the CCC, together with its components – Days Sales Outstanding (DSO), Days Inventory outstanding (DIO) and Days Payables Outstanding (DPO).

CCC is measured in days and depicts the “*time interval over which additional non-internal finance must be negotiated*” (Richards and Laughlin, 1980):

$$CCC = \frac{Account\ Receivables}{Total\ Sales} \times 365 + \frac{Inventory}{COGS} \times 365 - \frac{Account\ Payable}{COGS} \times 365 \quad [3]$$

The first component is DSO and measures the number of days necessary to collect receivables after a sale has been made. The second component is DIO and measures the number of days the inventory is retained before being sold. The third component is DPO and measures how many days the company takes before paying its suppliers.

This work project adopts a dynamic approach as CCC, and its drivers, are suitable metrics to study if FBs generate internal liquidity faster than Non-FBs. In addition, DSO and DPO are

a good proxy for the bargaining power, and they can help to validate the hypothesis that FBs enjoy more favorable conditions with suppliers and customers (Varaldo et al. 2009).

### **3. Literature review**

Previous literature<sup>6</sup> seems to agree on the better profitability of FBs when comparing to Non-FBs. The pioneer research by Anderson and Reeb (2003) analyzed a sample of companies from the S&P 500 drawing the conclusion that FBs showed better ROA than Non-FBs, especially when the CEO is a family member. According to the authors, such result is related to a better understanding of the business and to the long-lasting trustworthy relationship that FBs build with stakeholders. Even in Italy, the literature mostly agrees with those conclusions. Culasso et al. (2012) analyzed a sample of Italian listed companies and found a higher ROA for small/mid cap FBs. Erbetta et al. (2013) argue that family involvement in Italian manufacturing firms results in an outperforming ROA due to lower costs of labor. Chamocho Diaz (2014) found Italian medium FBs more profitable than Non-FBs in terms of ROA, but no significant relationship between family ownership and profitability. Conversely, Sciascia and Mazzola (2008) find that the lack of managerial skills in Italian FBs constrains the ability of acquiring new resources and combining them to generate additional revenues.

Regarding WCM, the relationship between CCC and profitability has been the object of plenty of research. Most results point in the direction of a negative correlation between the two variables. Provasi, Saracino and Riva (2019) found significant negative correlation for Italian textiles firms and thus suggested that managers should reduce CCC to a minimum. As opposed to that, Muscettola (2014) found a positive correlation between the CCC components DSO and DPO and profitability in Italian SMEs, recommending managers to extend average collection and payable periods in order to improve profitability. Earlier, similar results were obtained by

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<sup>6</sup> See appendix 4 for comprehensive tables of previous literature about FBs.

Mathuva (2010) who argues that firms can reduce their variable costs by extending their DIO and increase profitability if delaying payments to suppliers.

When it comes to FBs, fewer studies have addressed liquidity. By adopting a static approach, Thompson, Lu-Andrews and Liang (2016) demonstrated that FBs show conservative<sup>7</sup> patterns, hoarding more corporate liquid assets to prevent underinvestment from external costing finance. Amann and Jaussaud (2011) reach the same conclusion, finding that FBs operate with higher current ratio and quick ratio<sup>8</sup> to preserve more operational flexibility. However, to the best of our knowledge, no previous studies investigated the liquidity management of FBs based on a dynamic approach. Therefore, it is necessary to draw assumptions from related literature. Dieguez Soto et al. (2014) and Arrondo-Garcia, Fernández-Méndez and Menéndez-Requejo (2016) suggest that FBs tend to finance themselves through internally generated sources of liquidity. Hence, one may argue that they release internal liquidity faster to minimize “the time interval over which additional non-spontaneous finance must be negotiated” (Richards and Laughlin 1980, p.34). Another plausible assumption is related to the corporate governance characteristics of FBs and, in particular, to the stewardship theory. The literature agrees on the favorable conditions FBs obtain from their suppliers and customers. Varaldo et al. (2009) argue that suppliers appreciate the business continuity that Italian FBs guarantee and are willing to grant them better conditions. The same argument is sustained by Sciascia (2011) according to whom Italian FBs weave strong relationship with suppliers. Miller and Le Breton-Miller find that FBs generate competitive advantage by investing in their relationship with suppliers and customers. In light of this, assuming a FBs have shorter DSO and a longer DPO (and therefore a shorter CCC) than Non-FBs would be an even sounder hypothesis.

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<sup>7</sup> A conservative approach to WCM entails retaining more liquidity tied up in the company: the proportion of current assets over total assets tend to be higher. Conversely, an aggressive WCM implies a lower investment in short-term assets: the proportion of current assets over total assets tend to be lower.

<sup>8</sup>  $Current\ Ratio = \frac{Current\ Assets}{Current\ Liabilities}$ ;  $Quick\ Ratio = \frac{Current\ Assets - Inventory}{Current\ Liabilities}$ .

## 4. Methodology

### 4.1 Research Questions (RQ)

As stated in section 1, the purpose of this Work Project is two-fold. In a first stage, it investigates the differences in profitability and CCC between FBs and Non-FBs using univariate analysis, namely descriptive statistics, such as mean, median and standard deviation, and T-tests for the key variables (ROA, GSM, OR, CCC, DSO, DIO, DPO) in the research. Subsequently, a bivariate and a multivariate analysis are performed to study the association and causality between liquidity and profitability in Italian companies, and to verify if such differences between FBs and Non-FBs are determined by a dissimilar approach to CCC. The aforementioned statistical analysis is conducted through IBM SPSS 20.

The first RQ addresses the differences in profitability:

*RQ1: Do ROA and ROA drivers significantly differ between FBs and Non-FBs?*

To answer RQ1, the median values of ROA and its drivers (GSM, OR, AT) are compared through a non-parametric median test<sup>9</sup>. This choice is motivated by the non-normal distribution of OR and ROA<sup>10</sup>. Additionally, to add robustness to the research, an independent sample T-test<sup>11</sup> is performed on the same variables.

RQ2 executes an analogous analysis to assess differences in CCC between FBs and Non-FBs. Again, since the Shapiro-Wilk test revealed that CCC and its components are not normally distributed, the comparison is first conducted with the median test, and subsequently backed with a T-test for robustness purposes.

*RQ2: Do CCC and its components differ between FBs and Non-FBs?*

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<sup>9</sup> Non-parametric tests are statistical tests that do not require a normal distribution of the population to meet the required assumptions to be analyzed. The median test verifies if two populations are different in median with respect to a variable. <https://www.spss-tutorials.com/spss-median-test-for-2-independent-medians-simple-example/#:~:text=Median%20Test%20in%20SPSS&text=We%20use%20a%20McNemar%20test,samples%20for%20comparing%20%20medians.>

<sup>10</sup> Results of the Shapiro-Wilk test of normality can be found in Appendix 5.18

<sup>11</sup> The independent sample t-test is a parametric statistical test that compares two population to verify if their mean values are significantly different. <https://libguides.library.kent.edu/spss/independentttest>

The second part starts with a bivariate analysis to verify the correlation between CCC and profitability. Thus, RQ3 is set:

*RQ3: Are CCC and its components correlated to GSM?*

The proxy chosen for profitability is GSM for two reasons. Firstly, it is significantly different in median (and mean) between FBs and Non-FB. Secondly, it depends on the prices paid to suppliers and received from customers, thus allowing a better understanding of whether FBs do achieve a higher profitability due to their favorable relationship with their suppliers and customers. Therefore, RQ3 studies the correlation between GSM and CCC through the Pearson and Spearman<sup>12</sup> correlation coefficients.

Lastly, this study conducts a multivariate analysis to verify if the different approaches in CCC between FBs and Non-FBs are determinants of their difference in GSM.

*RQ4: What is the impact of DSO, DIO and DPO on GSM?*

For this purpose, a linear multivariate regression is run, using the Ordinary Least Squares (OLS) method according to the model:

$$GSM_i = \beta_{0i} + \beta_{1i} * DSO_i + \beta_{2i} * DIO_i + \beta_{3i} * DPO_i + \beta_{4i} * D/E_i + \beta_{5i} * LNASSETS_{i+} + \beta_{6i} * DFAMILY_{i+} + \beta_{7i} * DYEAR_{2019i} + \beta_{8i} * DYEAR_{2020i} + \beta_{9i} * DSECTOR_{3i} + \beta_{10i} * DSECTOR_{4i} + \epsilon_i \quad [4]$$

where  $\beta_{0i}$  is the intercept and contains all the factors not explicit in the model that may explain the dependent variable. Coefficients from  $\beta_{1i}$  to  $\beta_{3i}$  measure the impact of CCC components on GSM. The dependent variable D/E measures the effect of an indebted capital structure on the gross margin. Muscettola and Naccaro (2016) showed that most profitable Italian firms run on a lower leverage. Thus, a negative coefficient is expected as suppliers might perceive indebted companies as riskier and therefore ask higher prices to enter a business relationship with them.  $\beta_{5i}$  estimates the impact of size on the dependent variable. Such impact is expected to be positive

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<sup>12</sup> The Pearson correlation coefficient is a measure of the linear association between n couple of datapoints which follow a normal distribution. The Spearman coefficient is an index of the monotonic relationship between two variables, and it is usually used when the assumption of a normal distribution is not tenable (Artusi, Verdeiro and Marubini, 2002). The alignment of both coefficients will be assumed as proof for the robustness of results.

as a larger size may imply more bargaining power with suppliers and customers. In addition, the model contains five dummy variables. The dummy variable FAMILY assumes value 1 if a family exercise direct influence on a company, 0 otherwise. The dummies SECTOR\_3 and SECTOR\_4 control for the effect of different areas of economic activity<sup>13</sup>. Lastly, YEAR\_2019 and YEAR\_2020 account for the different years in the data sample.

## 4.2 Sample and Data

The initial sample for this research consisted of 81 small/mid cap Italian listed companies. The selection of the sample was based on the criterium of being listed in the FTSE Italia STAR index<sup>14</sup>. This index contains the most innovative Italian mid-size to large companies which attend some strict requisites in terms of transparency, liquidity of the stock and corporate governance. While other Italian indices – i.e., FTSE MIB – see a prevalent presence of financials and utilities, the FTSE Italia STAR index is characterized by the prevalence of the industrial sector (Focus Risparmio, 2020)<sup>15</sup>. Data from the consolidated balance sheets and Income Statements of the selected companies were retrieved from the Bureau Van Dijk AIDA database and were collected for the three-year period 2018-2020. While 2020 is the most recent year with data availability, 2018 was chosen as the starting year for two reasons: 1) a three-year period is considered long enough to avoid cyclical effect on financial statements; 2) for some elements of the sample, balance sheet data were only available from 2018 onwards.

In a first step, the sample was reduced to only non-financial companies by ruling out nine banks and investment firms. Subsequently, 27 non-manufacturing companies (wholesalers and services companies) were excluded from the sample to allow for a better comparability, decreasing the sample to 45 companies<sup>16</sup>. The criteria considered for this purpose is the

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<sup>13</sup> See appendix from 5.13 to 5.16 for detailed list of Areas of Economics Activity.

<sup>14</sup> The full list of companies listed in the index can be found here: <https://www.borsaitaliana.it/borsa/azioni/stars/lista.html?lang=en>.

<sup>15</sup> Trappolini Alessio. 2020. “E’ lo STAR la Nostra America”. Focus Risparmio, July 2020. <https://www.focusrisparmio.com/news/indice-star-borsa-italiana-mid-small-cap>.

<sup>16</sup> See appendix 5.1 – 5.5 for comprehensive list of companies in the sample.

definition of manufacturing given by the Congressional Research Service of the U.S.<sup>17</sup> Government. This exclusion is based on the different characteristics of manufacturers when compared to wholesalers and service companies. While the former executes a complete production process from input to output through a “physical, mechanical, or chemical transformation” (Levinson, 2017), the latter two are either intermediaries or offer intellectual services (consulting). Therefore, manufacturers are usually characterized by a longer CCC which determines consequences on their level of profitability, as demonstrated by Nobanee, Abdullatif and AlHjjar (2010). After this exclusion, from the remaining 45 companies, six had unavailable or incomplete data and had to be taken out of the sample.

Finally, before proceeding to the analysis, the sample data was checked for outliers according to the Z-score method (Senthamarai Kannan, K. et al., 2015). The key variables analyzed for this purpose were CCC, DSO, DIO, DPO, ROA, GSM, AT, OR. In total, three companies and nine firm-year observations were excluded from the sample as their z-score was abundantly above the absolute value of 3. After all these exclusions, the final sample for this Work Project comprises 36 companies and 108 firm-year observations.

Before proceeding with the analysis, a Shapiro-Wilk<sup>18</sup> test for normality was executed on the key variables of the research (CCC, DSO, DIO, DPO, ROA, GSM, AT, OR). The result suggests that it is possible to reject the null hypothesis of normality<sup>19</sup> for CCC and its components as well as for ROA and OR. Therefore, in addition to parametric tests (independent sample t-test and Pearson correlation), this Work Project will use non-parametric tests (SPSS median test and Spearman correlation) to answer research questions and providing further robustness to the results.

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<sup>17</sup> See comprehensive definition in *Appendix 5.12*.

<sup>18</sup> See *Appendix 5.18* for Shapiro-wilk test results.

<sup>19</sup> The Shapiro-Wilk test analyses if a variable is normally distributed in a sample. <https://www.spss-tutorials.com/spss-shapiro-wilk-test-for-normality/>.

Size and debt are two factors of interest as previous literature has shown different traits for FBs and Non-FBs. Regarding size, the FTSE STAR Italia Index includes companies with an asset size ranging from €40mln to €1bln. FBs in the sample are on average twice as big as Non-FBs, both in terms of Total Assets (Median Tot. Assets<sub>FBs</sub> = 465mln €; Median Tot. Assets<sub>Non-FBs</sub> = 214 mln €) and Total Revenues (Median Tot. Revenues<sub>FBs</sub> = 332mln €; Median Tot. Revenues<sub>Non-FBs</sub> = 162mln €). This is unusual: FBs perceive growth strategies harmful for liquidity and loss of control over the company. Nonetheless, FBs may grow and, therefore, increase in size, when second generations are pursuing specific strategic goals - i.e., internationalization and penetration of foreign markets (Eddleston, 2013; Cirillo and Sciascia 2020), which can be the reason for the larger size in the selected sample. As for debt, the dichotomy between equity dilution and greater risk related to higher leverage is a distinctive trait observed by the literature (Dieguez Soto et al. 2015). FBs in the sample present a more leveraged capital structure than Non-FBs (Median D/E<sub>FBs</sub>=0.9; Median D/E<sub>Non-FBs</sub>=0.6). This indicates that FBs may be more inclined to borrow (possibly to finance their growth) in order to maintain control over the company (Anderson et al., 2002; Blanco-Mazagatos et.al 2007).

As far as the sub-industry is concerned, companies carrying out a similar manufacturing activity were grouped into four different Areas of Economic Activity (AEA)<sup>20</sup>. Each company is included in an AEA according to the starting figure of its three-digit Italian RAE code<sup>21</sup> (*Ramo di attività economica*). The most relevant is AEA 3, which includes 62 firm-year observations. AEA 4 is the second most represented with 27 firm-year observations, while AEA 2 and AEA 5 together only comprise 9 firm-year observations in total.

### **4.3 Identification of Family Business**

This Work Project intends to be aligned with previous works that have defined family business according to fractional equity ownership and control (Corbetta ,1995; Tagiuri and Davis, 1996).

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<sup>20</sup> A comprehensive list of companies and their area of economic activity is presented in *Appendix 5.14*.

<sup>21</sup> A comprehensive list of areas of economic activities is presented in *Appendix 5.13*.

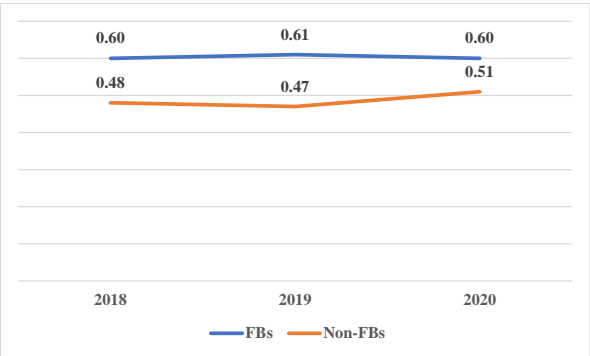
Thus, the coming analysis will consider FBs those firms which respond to the following prerequisites: (i) majority stake owned directly or indirectly (through holding companies) by one or more families bonded by kinship ties; (ii) the presence of two or more family members in the board of directors, or just one member if she or he is the CEO. This choice is motivated by the interest in emphasizing the level of influence a family is able to manifest on the strategy of the company. It relies on the assumption that even a single member of the family can influence the strategy if he/she holds the highest executive position.

The data sample includes 66 firm-year observations for FBs (61% of the sample) and 42 firm-year observations for Non-FBs (39% of the sample) over the three considered years. FBs and Non-FBs are distributed across AEA as follows: AEA 3 includes 42 firm-year observations for FBs and 30 for Non-FBs; AEA 4 comprises 18 firm-year observations for FBs and 9 for Non-FBs; AEA 2 and AEA 5 contain 6 firm-year observations for FBs and 3 for Non-FBs.

**4.4 Descriptive Statistics<sup>22</sup>**

*Profitability: ROA and ROA Drivers<sup>23</sup>*

Figure 1: Evolution of Gross Sales Margin



FBs show a slightly higher median ROA than Non-FBs in 2018 (0.07 as compared to 0.06) and again in 2019 (0.06 as compared to 0.05, in median). The lower figure in 2019 might be due to a decrease in AT for FBs and in OR for Non-FBs. As opposed to that, the COVID-19

pandemic does not seem to have impacted the overall profitability as in 2020 ROA remained on the same level of 2019 for both FBs and Non-FBs.

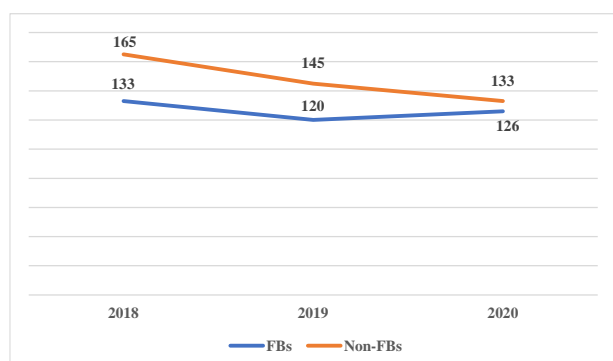
Non-FBs constantly outperform FBs in terms of efficiency in use of assets: the former shows an overall higher AT (+8%). Over the years, AT plunged for both FBs (Median AT<sub>2018</sub>

<sup>22</sup> See Appendix 6 for comprehensive table of descriptive statistics  
<sup>23</sup> To address the non-normal distribution of AT and OR, the descriptive analysis is based on the median values.

0.88; Median  $AT_{2020}$  0.65) and Non-FBs (Median  $AT_{2018}$  0.92; Median  $AT_{2020}$  0.86). Even though Non-FBs show a milder decrease. The causes of that can be tracked in an expansion process that both FBs and Non-FBs undertook before the pandemic (total assets increased by 34% from 2018 to 2020) followed by the revenue stagnation during the 2020 market downturn. As opposed to that, FBs presumably manage variable costs better as their GSM (0.60) is firmly above the same metric for Non-FBs (0.47) during the analyzed period. This might be explained by their favorable conditions with suppliers and customers assumed in section 3 (Varaldo et al. 2009; Miller et al. 2008). Nevertheless, while GSM remained basically unchanged over the three years for FBs, Non-FBs managed to improve it: from 0.47 in 2018 to 0.51 in 2020. Moreover, FBs seem to also have better contained the impact of fixed costs on their profitability during the 2019 expansion. Specifically, during 2018 and 2019, OR remained stable at roughly 0.16 for FBs, whilst it dropped greatly for Non-FBs: from 0.16 in 2018 to 0.11 in 2019. The diverse evolution in OR for FBs during 2019 can be explained by a possible better management of production process (aligned with Borghi S., *Finanza Online Finanza Online*, 2021)<sup>24</sup> or due to an increase in gross profit that offset the higher fixed costs keeping the degree of operating leverage (DOL)<sup>25</sup> unaltered.

### CCC and CCC Components

Figure 2: Evolution of CCC



A shorter median value for CCC for FBs ( $CCC_{FBs}=129$  days;  $CCC_{Non-FBs}=144$  days) in the period 2018-2020 shows that FBs may be faster in generating internal liquidity; perhaps because they rely more onto internal liquidity to sustain their operations (Dieguez Soto et

<sup>24</sup> Borghi Simone. 2021. "Ftse Italia Star vs Ftse Mib: l'indice dall'anima growth di Piazza Affari domina da anni per performance. <https://www.finanzaonline.com/notizie/ftse-italia-star-vs-ftse-mib-lindice-dallanima-growth-di-piazza-affari-domina-da-anni-per-performance/>.

<sup>25</sup>  $DOL = \frac{\% \text{ change in Sales}}{\% \text{ change in EBIT}}$ . Measures how a given change in sales volume affects the net operating income .

al., 2014; Arrondo-Garcia et al. 2016). However, median CCC for Non-FBs decreased throughout the years. It decreased from 165 days in 2018 to 133 days in 2020. Conversely, the median of CCC in FBs, after 13 days decrease in 2019 (from 133 to 120), saw a slight increase (+6 days) in 2020. The most important difference between the two groups lies in the magnitude of their CCC components, specifically DIO and DPO. In the case of median DIO, FBs take 68 days more to convert inventory into liquidity than Non-FBs. In 2019, despite similar revenues increase (+30mln€), Non-FBs managed to shorten DIO by 20 days (from 179 to 159 days), while FBs remarkably increased it by 38 days (from 213 to 251). Hence, while for Non-FBs additional unit of revenues translate in a faster conversion of the inventory, FBs adopt a different WCM approach and increase their inventory level. This is in line with the findings of Thompson et al. (2016) and Amann and Jaussaud (2011). Yet, FBs and Non-FBs reacted to the pandemic in different ways. Between 2019 and 2020, Non-FBs increased DIO (from 159 to 166 days), probably in response to possible supply chain disruption. In FBs, DIO reduced (from 251 to 216 days) despite a slight revenue increase in 2020. This might be explained by the uncertainty related to the pandemic: as the volume of business became difficult to forecast, FBs decided not to buy further inputs but rather use the ones in stock. Regarding DPO, the theory that FBs build trustworthiness with suppliers (Varaldo et al., 2009; Miller et al. 2008) seem to be confirmed: suppliers grant to FBs roughly two months more to pay their accounts than Non-FBs. In 2018, DPO amounted to 186 days in FBs while it was only 124 for Non-FBs. However, median DPO dropped over the following two years (182 days in 2019 and 181 in 2020), meaning that FBs were not able to obtain further delays in payment when business increased in 2019. Nor were they able to do so during the pandemic. As opposed to that, Non-FBs were able to exploit the market downturn in 2020 to increase bargaining power with suppliers: their DPO jumped from 124 to 130 days. Regarding DSO, FBs concede longer periods (105 days over the three years) to customers before collecting their credits, probably in articulation to the longer

DPO they are granted. On the other hand, Non-FBs are more efficient and were able to decrease their DSO from 91 days to 81 days in 2019. In 2020, however, the liquidity pressures due to the pandemic forced them to grant their customer more time (one hundred days).

## 5. Results

### 5.1 Differences in Profitability (RQ1)

Figure 3: P-values for mean test and median test: profitability

	Mean		Median FBs		P-value (mean)	P-value (median)	Significant
	FBs	Non-FBs	FBs	Non-FBs			
GSM	0.60	0.48	0.60	0.48	<0.001	<0.001	Yes
AT	0.78	0.90	0.77	0.86	0.06	0.24	No
OR	0.15	0.15	0.15	0.13	0.75	0.24	No
ROA	0.06	0.07	0.06	0.05	0.78	0.43	No

ROA and its determinants (AT, GSM, OR) were tested for significant differences between FBs and Non-FBs. The T-test and the median test give the same result: The difference in ROA between FBs and Non-FBs, besides being very small (0.01), it is not statistically significant (t-test:  $p = 0.80$ ; median test:  $p = 0.43$ ). Thus, when ROA is considered, there is no significant difference in profitability between FBs and Non-FBs. This finding is unexpected as most previous studies about listed and non-listed firms revealed a superior ROA performance for FBs. With respect to ROA drivers, the difference in OR hypothesized in the data analysis was found to be not significant (t-test:  $p = 0.764$ ; median test:  $p = 0.24$ ). As opposed to that, a remarkable difference is observed for GSM: FBs operate with 12% more gross margin than Non-FBs, and the difference is significant at a 99% confidence level ( $p < 0.001$ ) for both the T-test and the median test. A plausible explanation is the higher bargaining power of FBs in dealing with suppliers, suggesting that they are paying lower prices<sup>26</sup>. However, negotiating power should not be seen as hostile bargaining. The better conditions FBs receive can be explained by the stewardship theory: their tendency towards altruistic behaviors result in long-

<sup>26</sup> Table with difference in mean/median for COGS/Tot.Sales in appendix 7.2.

term business relationships with suppliers (Sciascia 2011; Miller and Le Breton-Miller, 2006) and allow FBs to obtain more profitable terms. Regarding AT, both tests confute the hypothesis of a significant difference. Nevertheless, it should be noticed that the p-value for the T-test is 0.056 close to the conventionally accepted value of 0.05. Thus, FBs might actually be less efficient in the use of assets to generate profit than Non-FBs. This result is in line with Erbetta et al. (2013) and with Sciascia and Mazzola (2008). However, the high p-value of the median test (0.24) does not allow to draw this conclusion.

## 5.2 Differences in CCC (RQ2)

Figure 4: P-values for mean test and median test: CCC and CCC components

	Mean		Median FBs		P-value (mean)	P-value (median)	Significant
	FBs	Non-FBs	FBs	Non-FBs			
DSO	106	99	106	91	0.31	0.24	No
DIO	249	170	233	166	<0.001	0.05	Yes
DPO	219	133	184	125	<0.001	<0.001	Yes
CCC	136	136	129	145	0.99	0.43	No

The Median and the T-test show similar outcomes: There are no significant differences in CCC between FBs and Non-FBs (t-test:  $p=0.99$ ; median test:  $p=0.43$ ). Therefore, the assumption of shorter CCC because of the higher reliance on internal liquidity can be rejected. Nevertheless, the median test shows a highly significant longer DPO for FBs ( $p<0.001$ ). This result is confirmed by the T-test which gives the same p-value. Hence, it is possible to affirm that FBs are able to pay their supplier roughly 60 days<sup>27</sup> later than Non-FBs. This further confirms the hypothesis that FBs exercise a higher negotiating power with suppliers due to the stewardship approach (Varaldo et al., 2009; Miller and Le-Breton-Miller, 2008). The continuity in business granted by family control gets suppliers to accept longer payment terms. The longer DPO also suggests that FBs might be extending their payable period to pursue more investment opportunities and therefore retaining less liquidity within the company<sup>28</sup>. This finding

<sup>27</sup> Because of the non-normal distribution of DPO, the difference in median value is considered.

<sup>28</sup> Check appendix 7.6 for the correlation between DPO and liquidity ratios.

contradicts the conservative approach suggested by Thompson et al. 2016 and Malchek et al. 2018. As far as DIO is concerned, the T-test and the median test both show that FBs hold inventory 68 days<sup>29</sup> longer than Non-FBS before selling it (T-test:  $p < 0.001$ ; Median test:  $p = 0.05$ ). This result suggests that FBs might be buying more quantity from suppliers and retaining the inventory for longer periods. To provide further robustness to this analysis, Spearman correlation coefficients for DIO, DPO and the natural logarithm of sales (LNSales) are analysed to exclude the possibility that differences in CCC are related to the different volumes of business. The correlation matrix<sup>30</sup> reveals that there is no significant Spearman correlation between DPO and DIO and LNSales for FBs ( $p = 0.554$ ;  $p = 0.076$ ). Therefore, it is legitimate to assume that the longer DIO and DPO stem from a different approach to CCC by FBs.

### 5.3 Correlation between CCC and GSM (RQ3)

Figure 5: Pearson correlation coefficients: GSM and CCC components

GSM	FBs				Non-FBs			
	DSO	DIO	DPO	DPO-DSO	DSO	DIO	DPO	DPO-DSO
Pearson	0.162	0.535	0.622	0.627	0.327	0.466	0.582	0.463
p-value	0.195	<0.001	<0.001	<0.001	0.035	0.002	<0.001	0.002
Spearman	0.126	0.592	0.375	0.433	0.292	0.453	0.346	0.220
p-value	0.313	<0.001	0.002	<0.001	0.060	0.003	0.025	0.162

Both FBs and Non-FBs reveal a significant positive correlation between DIO and DPO, and GSM. Pearson and Spearman p-values are below the threshold value of 0.05.

The positive association of DIO and GSM suggests that a longer period of inventory turnover corresponds to a higher sales margin. This result is in line with Mathuva (2010). By retaining significantly higher levels of inventory than Non-FBs, FBs may be improving gross margin in three ways: (i) reducing the costs of interruption in production due to scarcity of raw materials; (ii) reducing the impact of input prices fluctuation caused by 2019 USA-China tensions (JP Morgan, Working Capital Index 2020); (iii) taking advantage of reduction in prices granted by suppliers for larger orders. In light of this, it is possible to affirm that the longer

<sup>29</sup> Because of the non-normal distribution of DIO, the difference in median value is considered.

<sup>30</sup> See appendix 7.3 and 7.4 for the comprehensive Pearson and Spearman correlation matrices.

inventory turnover period is related to the difference in GSM between FBs and Non-FBs. As far as DPO is concerned, the result suggests that the longer the payable period, the higher the GSM, meaning that both FBs and Non-FBs exercise bargaining power with their suppliers. The great difference lies in the fact that not only are FBs able to obtain a longer DPO than Non-FBs, but they are also able to get lower prices<sup>31</sup> along with it (RQ1)<sup>32</sup>. Therefore, it is possible to affirm that the higher bargaining power of FBs with their suppliers might be a factor in determining the difference in GSM. To provide robustness to this hypothesis, the Spearman correlation between GSM and DPO-DSO (difference between sales outstanding and payable period) is verified. DPO-DSO can be used as a further measure of the bargaining power with external stakeholders (Provasi et al. 2019). The Spearman correlation is positive and highly significant ( $p = <0.001$ ) for FBs, while it is hardly significant for Non-FBs ( $p = 0.162$ ). This means that the association between bargaining power and GSM is stronger and more robust for FBs.

Lastly, it should be noted that DPO is positively correlated to DSO for FBs ( $p < 0.001$ ), suggesting that, since FBs enjoy longer DPO, they grant longer DSO. Nevertheless, DSO does not show any positive correlation with GSM, meaning that FBs wait longer to collect their credits without enjoying any benefit in terms of profitability.

#### 5.4 Impact of CCC on GSM (RQ4)

The regression model reported the following coefficients:

Figure 6: Multivariate regression coefficients

	Constant	DSO	DIO*	DPO*	LNAssets	D/E*	FAMILY*	YEAR_2019	YEAR_2020	SECTOR_3	SECTOR_4
Coefficient	0.066	0.000	0.000	0.001	0.017	-0.047	0.065	0.018	0.017	0.002	-0.057
p-value	0.765	0.716	0.008	<0.001	0.129	0.018	0.004	0.411	0.450	0.948	0.094

\* the coefficient is significant

The  $R^2$  of the model is 0.59 and it is significant ( $F < 0.001$ ).

<sup>31</sup> See appendix 7.2 for difference in mean and median for COGS/Tot.Sales between FBs and Non-FBs.

<sup>32</sup> Spearman correlation between DPO-DSO and COGS in appendix 7.5 further confirms this conclusion.

The constant of the model is not significant ( $p=0.765$ ), meaning that if all the dependent variables were equal to zero, GSM would not be significantly different from zero. This suggests that the effect on GSM of other variables omitted from the model might not be significant and, therefore, the independent variables in the models are good predictors of the dependent variable.

The dummy variables YEAR\_2019, YEAR\_2020 have not significant impact on the GSM: all their p-values are far above the conventional value of 0.05. Thus, the year of activity does not present any effect on GSM. This is an expected result as variables costs can be reduced according to the level of production. In addition, GSM does not change significantly between the two most represented sectors in the sample: the p-values for the two dummies SECTOR\_3 and SECTOR\_4 are not significant ( $p=0.948$  and  $p=0.094$ ).

DPO is extremely significant ( $p<0.001$ ). This means that every additional day firms can wait before paying their suppliers makes GSM increase by 0.001<sup>33</sup>. Therefore, considering that FBs show a significantly higher median DPO (+60 days), it is possible to conclude that greater bargaining power of FBs with their supplier is a determinant of their better GSM when compared to Non-FBS. This result, together with the previous conclusions, confirms the theories of previous literature which argues that the business continuity and the long-term relationship that families build allow them to achieve better conditions when dealing with suppliers; both in terms of payable periods and price (Varaldo et al. 2009, Miller, Le Breton-Miller, 2006; Uhlaner, 2006). The significant positive coefficient ( $p = 0.004$ ) for FAMILY further backs this result. Thus, it is possible to conclude that, when a family is the majority shareholder and family members seat in the board of directors, the GSM is higher.

As far as DSO is regarded, the model shows no significant impact on GSM ( $p=0.716$ ). By combining this result with RQ3, it is possible to conclude that FBs are not experiencing any

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<sup>33</sup> Beta coefficients for DPO and DIO may seem small. However, it should be noticed these variables are expressed in days while GSM is expressed as a percentage. For example, the difference in number of DPO between FBs and Non-FBS multiplied by the beta coefficient results in an important percentage variation in GSM:  $(184-124) * 0.001 = 6\%$ .

benefit in terms of profitability from extending their collection period.

Further, the coefficient for DIO is also significant ( $p=0.008$ ). The results of the regression reveal that an increase in one day of inventory retention translates in an increase in GSM of 0.000213. Hence, the longer median DIO of FBs (+68) is a determinant and contributes to explaining the higher GSM of FBs. This finding suggests that FBs reduce variable costs by retaining inventory for longer periods of time, in accordance with Mathuva (2010).

Finally, D/E and LNAssets were included in the model to verify if the differences in capital structure and size across sample had an impact on GSM. LNAssets did not report a significant coefficient ( $p=0.123$ , respectively). This suggests that larger companies in the sample do not enjoy better price conditions due to their size. This is an important result because FBs in the sample are significantly larger than Non-FBs. Therefore, a non-significant impact of size manifests that their higher margin comes rather from the way they interact with suppliers. As opposed to that, the more indebted capital structure of FBs does affect the GSM. The dependent variable D/E shows a p-value of 0.018 and the regression coefficient suggests that its impact on the gross margin is heavy: an increase in D/E by one unit decreases GSM by 0.047. In this respect, the more indebted capital structure of FBs (median  $D/E_{FBs}= 0.91$ ) in comparison to Non-FBs (median  $D/E_{Non-FBs}= 0.60$ ) causes the former a larger reduction in GSM. Nevertheless, in spite of the higher debt, FBs still manage to generate a significantly higher GSM (+0.12) than Non-FBs. This would further suggest that, besides longer periods of payment to suppliers, FBs also buy input at lower prices.

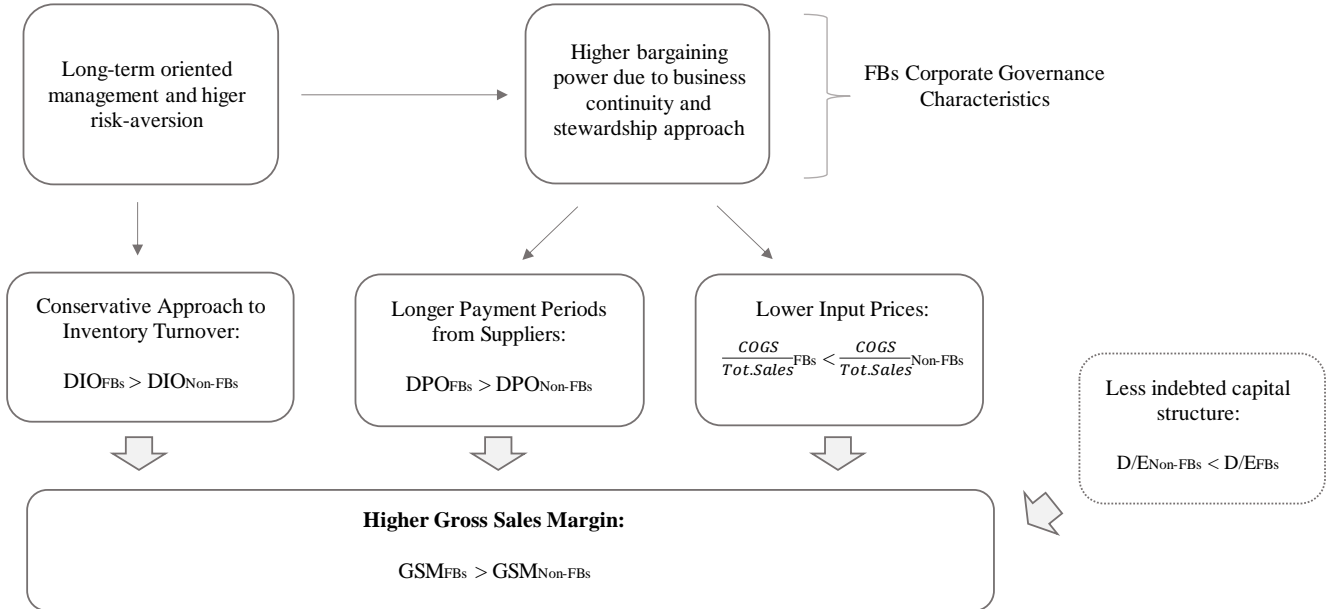
### **5.5 Internal Validity of the Regression Model**

This study considers three parameters to evaluate the internal validity of the regression model. First, the Durbin-Watson coefficient is 2.025. The rule of thumb suggests that values in the range of 1.5 to 2.5 are to be retained acceptable and cause no concern (Field, 2009). Therefore, the hypothesis of non-autocorrelated errors is not rejected and it is possible to conclude that

there is no significant autocorrelation of residuals<sup>34</sup>. Secondly, the model is tested for multicollinearity – i.e., correlation between the independent variables – measured by the Variance Inflation Factors (VIF). Since the VIF coefficients for all the independent variables are between 1 and 5 (Montgomery et al., 2012, p.296), it is possible to affirm that multicollinearity does not invalidate the reliability of the model<sup>35</sup>. Lastly, the scatter plot of the regression residual does not show any particular distribution pattern. Therefore, a random distribution of residuals can be assumed.

### 6. Conclusion and Recommendations to Managers

Figure 7 : Conclusions Diagram FBs vs Non-FBs



The purpose of this Work Project is two-fold: (i) to verify the differences in profitability and CCC between FBs and Non-FBs; (ii) to assess how CCC impacts profitability. The analysis performed on the sample of Italian companies led to three main conclusions.

When ROA is considered, there is no significant difference in profitability between FBs and Non-FBs. They both operate at roughly the same level of return on assets (6%) over the

<sup>34</sup> <https://www.statisticshowto.com/durbin-watson-test-coefficient/>.  
<sup>35</sup> <https://www.statisticshowto.com/variance-inflation-factor/>.

period 2018-2020. However, when ROA is broken down into its three components – GSM, OR, AT –, it is possible to observe that FBs continuously generate a higher GSM (+12%) than Non-FBs.

The corporate governance characteristics of FBs lead to significant differences in DPO and DIO. FBs take advantage of their favorable conditions with suppliers by paying them off 60 days later than Non-FBs. They might be delaying payments to use internal liquidity to invest in short-term operations. However, the constantly lower figure in AT suggests that such investments are not generating additional productivity of assets. This is in line with Sciascia and Mazzola (2008) who argue that the lack of managerial skills of FBs reduces the capacity of obtaining new resources and combining them to generate additional revenues. Therefore, FBs might either consider improving their management decisions with regard to use of resources or make use of the longer DPO to improve their internal liquidity position. In the case of DIO, FBs take 68 days more than Non-FBs to complete their inventory turnover. Thus, the former keep their inventories tied-up in the company for longer periods, backing the findings of Thompson et al. (2016). By doing so, on the one hand they avoid losing activity due to supply chain disruption (Mathuva, 2010), while on the other hand FBs reduce variables costs by purchasing more stock of inputs from suppliers.

Lastly, this paper concludes that, when a family is the majority shareholder and family members seat in the board of directors, GSM increases; and CCC play a significant role in this regard. By increasing either DPO or DIO, FBs generate more GSM than Non-FBs. A possible explanation for this is that by taking advantage of their business continuity and long-term relationship with suppliers, FBs negotiate lower prices and longer payment periods than Non-FBs. This interpretation is aligned with the mainstream of literature that found a competitive advantage for FBs due to their stewardship approach (Anderson and Reeb, 2003; Miller and Le Breton-Miller, 2008; Varaldo et al. 2009). Hence, managers of Non-FBs may recover the gap

in GSM with FBs by negotiating better conditions (payment period and price) with their suppliers and by increasing their DIO.

In addition, this study found GSM negatively impacted by a more indebted capital structure. Suppliers demand higher prices to enter into a business relationship with more leveraged firms. Therefore, managers of FBs and Non-FBs should consider reducing their debt exposure to further boost GSM.

Lastly, it is possible to argue that there is a sub-optimal DSO management performance by FBs. Since they have longer DPO, they also grant longer DSO to their customers. Yet, GSM is not significantly impacted by the collection period, meaning that the longer DSO does not have any return in terms of profitability. Thus, FBs' managers should consider collecting their receivables sooner to enhance the generation of internal liquidity.

## **7. Limitations and Suggestions for Future Research**

A first weakness of this research regards the calculation of variable costs. In accordance with Whalen et al. (2011), this paper only considers COGS as variable costs, assuming salaries and wages as fixed costs. Therefore, the additional effect of the latter is not included in the calculations of the GSM. Future researchers may analyse if there is any change in the conclusions reached in this Work Project, should salaries and wages be assumed as variable costs.

Moreover, this study does not check for differences in geographical distribution of businesses. Previous research has shown that credit availability is not uniform across Italy. Companies operating in the North enjoy better access to credit (Sarno 2005; Confindustria, 2020). This might be a factor in determining the level of indebtedness and subsequent choices regarding CCC. An in-depth analysis regarding the effect of geographical area and credit constraints on FBs and Non-FBs is left to future research.

Furthermore, DPO and DSO ratios are not tax-adjusted: While their numerators include the Value Added Tax (VAT), their denominators do not. Hence, companies producing goods which have lower VAT rates<sup>36</sup> (Food and Beverage and agricultural products) might show lower figures for such variables. The homogeneous distribution of FBs and Non-FBs across sectors in the sample should balance out this limitation, provided that different VAT rates apply to the various AEA. Nevertheless, a thoroughly tax adjusted analysis would be necessary to rule out bias related to VAT.

In addition, this paper does not consider the effect of inflation on inventory valuation. Since the IFRS forbids the Last in First Out (LIFO) method, Italian companies evaluate their inventories by either using the First In First Out (FIFO) method or the average cost. In fact, in inflationary periods, FIFO measurement increases the GSM, such as inventory that might be several years old– and thus acquired at a lower cost – being used to value COGS. The average cost, instead, produces a less biased valuation. Therefore, future research may factor inventory valuation methods into the analysis to check if accounting choices in inventory valuation influence the profitability of FBs and Non-FBs.

This Work Project contributes to the existing literature on FBs by studying their approach to working capital management based on a dynamic method (CCC), which no other author had emphasized before to the best of our knowledge. While previous literature analyzed differences in profitability and liquidity between FBs and Non-FBs as distinct factors, this study provides a strong relationship between CCC components (DSO, DIO and DPO) and Gross Sales Margin that can be utilized by managers to enhance their profitability.

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<sup>36</sup> While the ordinary VAT rate in Italy is 22%, goods like food and beverage, agricultural products, electric energy and gas are deemed to be essential and are therefore applied lower rates, ranging from 4% to 10%. <https://www.agenziaentrate.gov.it/portale/web/guest/iva-regole-generalali-aliquote-esenzioni-pagamento/norme-general-e-aliquote>.

## References

- Allouche, José, Bruno Amann and Jacques Jaussaud. 2008. "The Impact of Family Control on the Performance and Financial Characteristics of Family versus Nonfamily Businesses in Japan: A matched-pair investigation". *Family Business Review*, 21(4): 315-330. <https://journals.sagepub.com/doi/10.1177/08944865080210040104>
- Amann, Bruno and Jaussaud Jacques. 2012. "Family and Non-family Business Resilience in an Economic Downturn". *Asia Pacific Business Review*, 18(2): 203-223. 10.1080/13602381.2010.537057
- Anderson, Bruno, Sattar A. Mansi and David M. Reeb. 2002. "Founding Family Ownership and Agency Cost of Debt". *Journal of Financial Economics*, 68(2): 263–285. [https://doi.org/10.1016/S0304-405X\(03\)00067-9](https://doi.org/10.1016/S0304-405X(03)00067-9)
- Anderson, Bruno and David M. Reeb, D.M. 2003. "Founding Family Ownership and Firm Performance: Evidence from the S&P 500". *Journal of Finance*, 58(3), 1301–1328. <https://www.jstor.org/stable/3094581>.
- Arrondo-García, Ruben, Carlos Fernández Méndez and Susana Mendez-Requejo. 2016. "The Growth and Performance of Family Businesses during the Global Financial Crisis: The Role of the Generation in Control". *Journal of Family Business Strategy*, 7(4). 10.1016/j.jfbs.2016.11.003.
- Blanco-Mazagatos, Virginia, Esther de Queved-Puente and Luis A. Castrillo. 2007. "The Trade-off between Financial Resources and Agency Costs in the Family Business: an Exploratory Study". *Family Business Review*, 20(3): 199–213. 10.1111/j.1741-6248.2007.00095.x.
- Bloch, A., Kachaner, N., Stalk, G. 2012. "What You Can Learn from Family Business". *Harvard Business Review*, 90(11): 1-5. <http://www.leaderslaboratory.com/wp-content/uploads/2013/09/HBR-What-You-Can-Learn-from-a-Family-Business.pdf>
- Chamochumbi Diaz, Gail D. 2016. "Le Performance delle Medie Imprese Familiari nei Periodi di Crisi: un'Analisi Emprica nel Centro Italia". Università degli Studi di Urbino Carlo Bo. [https://ora.uniurb.it/retrieve/handle/11576/2644540/46423/Phd\\_uniurb\\_257627.pdf](https://ora.uniurb.it/retrieve/handle/11576/2644540/46423/Phd_uniurb_257627.pdf)

- Cirillo, Alessandro, Jolien Huybrechts, Donata Mussolino, Salvatore Sciascia, and Wim Voordeckers. 2020. "Researching Family Business Growth". *European Management Review*, (17)3: 733-746. <https://doi.org/10.1111/emre.12389>.
- Corbetta, Guido. 1995. *Le Imprese Familiari. Caratteri Originali, Varietà e Condizioni di Sviluppo*. Egea, Milano.
- Culasso, Francesca, Laura Broccardo, Elisa Giacosa, and Alberto Mazzoleni. 2012. "Corporate Governance in Listed Italian Family Firms: Impact on Performance and Comparison with Non-Family Firms". *Journal of Management and Change*, 5(4), 93-103. <http://dx.doi.org/10.22495/cocv5i4p8>
- Diéguez-Soto, Julio, Pilar Lopez-Delgado and Alfonso A. Rojo-Ramírez. 2015. "Identifying and Classifying Family Businesses". *Review of Managerial Science*, 9: 603-634. <https://doi.org/10.1007/s11846014-0128-6>
- Erbetta, Fabrizio, Anna Menozzi, Guido Corbetta and Giovani Fraquelli. 2013. "Assessing Family Firm Performance Using Frontier Analysis Techniques: Evidence from Italian Manufacturing Industries". *Journal of Family Business Strategy*, 4(2): 106-117. <http://dx.doi.org/10.1016/j.jfbs.2013.04.001>
- Fama, Eugene F., and M. C. Jensen. 1983. "Separation of Ownership and Control". *The Journal of Law and Economics*, 26(2): 301-325. <http://www.jstor.org/stable/725104>.
- Farris, Theodore M and Paul D. Hutchinson. 2002. "Cash-to Cash: the New Supply chain Management Metric", *International Journal of Physical Distribution & Logistic Management*, 32(4): 288-298. <https://doi.org/10.1108/09600030210430651>
- Field, Andy. 2009. "Discovering Statistics Using SPSS". 3rd Edition, Sage Publications Ltd., London.
- Gallo, Miguel A. & Alvaro Vilaseca. 1996. "Finance in Family Businesses". *Family Business Review*, 9(4): 387-401. <https://doi.org/10.1111/j.1741-6248.1996.00387.x>.
- Habbershon, Timothy. G., Mary L. Williams and Ian C. MacMillan. 2003 "A Unified System Perspective of Family Firm Performance". *Journal of Business Venturing*, 18(4): 451-465. [https://doi.org/10.1016/S0883-9026\(03\)00053-3](https://doi.org/10.1016/S0883-9026(03)00053-3)

- Handler, Wendy C. 1989. "Methodological Issues and Considerations in Studying Family Businesses". *Family Business Review*, 2(3): 257-276. <https://doi.org/10.1111/j.1741-6248.1989.00257.x>.
- Kaliyaperumal, Senthamarai K., Manoj Kuppusamy and S. Arumugam, S. 2015. "Labelling Methods for Identifying Outliers". *International Journal of Statistics and Systems*, 10(2): 231-238.  
[https://www.researchgate.net/publication/283755180\\_Labeling\\_Methods\\_for\\_Identifying\\_Outliers](https://www.researchgate.net/publication/283755180_Labeling_Methods_for_Identifying_Outliers)
- Levinson, Marc. 2017. "What is Manufacturing? Why Does the Definition Matter?". *Congressional Research Service*.  
[https://ecommons.cornell.edu/bitstream/handle/1813/77707/CRS\\_What\\_is\\_manufacturing.pdf?sequence=1&isAllowed=y](https://ecommons.cornell.edu/bitstream/handle/1813/77707/CRS_What_is_manufacturing.pdf?sequence=1&isAllowed=y)
- Machek, Ondrej, Jiri Hnilica and Daniela Kolouchová, D. 2015. "The impact of Family Control on profitability, Leverage and Liquidity: Evidence from the Czech Manufacturing Industry". Paper presented at the Conference: "7th International Scientific Conference Finance and Performance of Firms in Science, Education and Practice", Zlín, CZK
- Mandl, Irene. 2008. "Overview of Family Business Relevant Issues". *Austrian Institute for SME Research* on behalf of the European Commission.
- Mathuva, David M. 2010. "The Influence of Working Capital Management Components on Corporate Profitability: A Survey on Kenyan Listed Firms". *Research Journal of Business Management*, 3(1): 1–11. <http://hdl.handle.net/11071/3382>.
- Mazzi, Chiara. 2011. "Family Business and Financial Performance: Current State of Knowledge and Future Research Challenges". *Journal of Family Business Strategy*, 2: 166-181. <https://doi.org/10.1016/j.jfbs.2011.07.001>
- Miller, Danny, Le Breton-Miller, Isabelle and Scholnick, Barry. 2008. "Stewardship Vs. Stagnation: An Empirical Comparison of Small Family and Non-Family Businesses". *Journal of Management Studies*, 45(1): 51-78. 10.1111/j.1467-6486.2007.00718.x.
- Miller, Danny and Le Breton-Miller Isabelle. 2006. "Why Do Some Family Businesses Out Compete? Governance, Long-Term Orientations, and Sustainable Capability". *Entrepreneurship Theory and Practice*, 30(6): 731 - 746. 10.1111/j.1540-6520.2006.00147.x.

- Montgomery, Douglas C., Elizabeth A. Peck; Geoffrey G. Vining. 2012. "Introduction to Linear Regression Analysis". 5th ed. Hoboken, NJ: Wiley (Wiley series in probability and statistics, 821).
- Moss, Jimmy D. and Bert Stine. 1993. "Cash Conversion Cycle and Firm Size: a Study of Retail Firms". *Managerial Finance*, 19 (8): 25–35. <https://doi.org/10.1108/eb013739>.
- Muscettola, Marco. 2014. "Cash Conversion Cycle and Firm's Profitability: an Empirical Analysis on a Sample of 4,226 Manufacturing SMES of Italy", *International Journal of Business and management*, 9(5): 25–35. 10.5539/ijbm.v9n5p25
- Muscettola, Marco and Francesco Naccarato. 2015. "The Casual Relationship between Debt and Profitability". *Athens Journal of Business and Economics*, 2(1):17-32. 10.30958/ajbe.212
- Nobanee, Haitham, Modar Abdullatif and Maryam AlHajjar. 2009. "Cash Conversion Cycle and Firm's Performance of Japanese Firms". *Asian Review of Accounting*, 19(2): 147-156. 10.1108/13217341111181078
- Provasi, Roberta , Paola Saracino and Patrizia Riva. 2019. "Evidence for Using the Cash Conversion Cycle to Test the Relationship with the Corporate Profitability: an Empirical Analysis on a Sample of Textile Italian SMEs". *International Journal of Economics and Business Research*, 18 (4):499-512. 10.1504/IJEER.2019.10024423
- Richards, Verlyn D., and Eugene J. Laughlin. 1980. "A Cash Conversion Cycle Approach to Liquidity Analysis." *Financial Management*, 9 (1): 32–38. <https://doi.org/10.2307/3665310>.
- Sciascia, S. 2011. *Risorse Familiari e Risultati Aziendali*. Giuffrè editore, Milano
- Sciascia, Salvatore and Pietro Mazzola. 2008. "Family Involvement in Ownership and Management: Exploring Nonlinear Effects on Performance". *Family Business Review*, 21 (4): 331-345. 10.1111/j.1741-6248.2008.00133.x
- Sciascia, Salvatore and Claudia Pongelli. 2019. "I Cinque Miti da Sfatare sulle Imprese Familiari". *Harvard Business review*, 2019/04/01: 108-111. [https://www.researchgate.net/publication/332445398\\_I\\_cinque\\_miti\\_da\\_sfatare\\_sulle\\_impres\\_familiari](https://www.researchgate.net/publication/332445398_I_cinque_miti_da_sfatare_sulle_impres_familiari)

- Shin, Hyun-Han, and Luc Soenen. 1998. "Efficiency of Working Capital Management and Corporate Profitability." *Financial Practice and Education*, 8: 37–45.
- Tagiuri, Renato and John Davis. 1996. "Bivalent Attributes of the Family Firm". *Family Business Review*, 9(2):199-208. 10.1111/j.1741-6248.1996.00199.x
- Teruel, Pedro J. G., and Pedro M. Solano. 2007. "Effects of Working Capital Management on SME Profitability". *International journal of Managerial Finance*, 3(2): 164–177. 10.1108/17439130710738718
- Thompson, Yin Yu, Ran Lu-Andrews and Liang, Fu. 2016. "Liquidity and Corporate Governance: evidence from Family Firms". *Review of Accounting and Finance*, 15(2): 144-173. 10.1108/RAF-03-2015-0039
- Uhlener, L. M. (2006). "Business family as a team: Underlying Force for Sustained Competitive Advantage. *Handbook of research on family business* (pp. 125-144). Cheltenham, England: Edward Elgar
- Varaldo, R., Dalli, D., Resciniti R., & Tunisini, A. 2009. *Un Tesoro Emergente. Le Medie Imprese Italiane dell'Era Globale*. FrancoAngeli, Milano
- Wild, John J., K.R. Subramanyam and Robert F. Hasley. 2005. "Financial Statement Analysis" 9<sup>th</sup> Edition. McGraw-Hill/Irwin

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## 1- General

### *Appendix 1.1 – Abbreviations, Acronyms and Siglas*

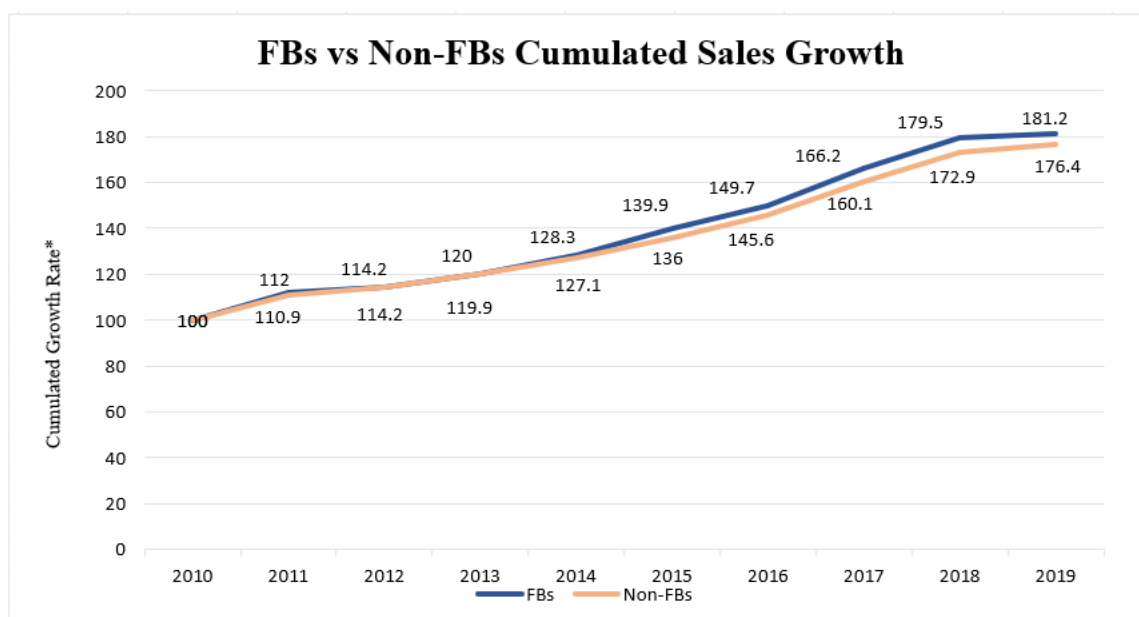
<b>Abbreviation</b>	<b>Meaning</b>
AEA	Area of Economic Activity
AT	Asset Turnover
CCC	Cash Conversion Cycle
CEO	Chief Executive Officer
COGS	Cost of Goods Sold
D/E	Debt-to-Equity Ratio
DIO	Days Inventory Outstanding
DOL	Degree of Operating Leverage
DPO	Days Payables Outstanding
DSO	Days Sales Outstanding
EBIT	Earning Before Interest and Taxes
FBs	Family Businesses
FIFO	First In First Out
GDP	Gross Domestic Product
GSM	Gross Sales Margin
IFRS	International Financial Reporting Standards
LIFO	Last In First Out
LTD	Long-Term Debt as % of Total Assets
Non-FBs	Non-Family Businesses
NWC	Net Working Capital
OLS	Ordinary Least Square
OR	Operating Risk
ROA	Return on Assets
RQ	Research Question
SME	Small-Medium Enterprise
STAR	FTSE Italia STAR Index
STD	Short-Term Debt as % of Total Assets
VAT	Value-added Tax
VIF	Variance Inflation Factor
WCM	Working Capital Management

## 2 - Family Businesses

### *Appendix 2.1 – FBs Corporate Governance Theories*

<b>Theory</b>	<b>Concepts</b>	<b>Application to FBs</b>
Resource-Based View	The competitive advantage of an enterprise is determined by the interaction of its resources	FBs' governance is defined by the particular interaction between the family members and the business entity
Agency Theory	Existence of perverse incentive to pursue their personal interest for agents who perform tasks on behalf of a principal	In FBs the risk of opportunistic behaviors is reduced as the interest of the family overlaps with the interest of the business entity
Stewardship Theory	Managers altruistically behave as stewards to obtain beneficial results for their organization beyond the mere monetary utility	The stewardship perspective views family businesses as a salutary organizational form, one that is conducive to corporate longevity and favourable relations with stakeholders

## Appendix 2.2 – Cumulated Sales Growth FBs vs Non-FBs



\*Compounded growth rate on a 100 basis (year 2010) calculated on total sales

Source: XII Osservatorio AUB. “Le imprese Familiari Italiane di Fronte alla Pandemia Covid-19”. 2021. <https://www.aidaf.it/wp-content/uploads/2021/01/26/Presentazione-XII-Osservatorio-AUB.pdf>

## Appendix 2.3 – Percentage of Italian Family-owned businesses

Ownership	Small		Medium-Large		Total	
	N	%	N	%	N	%
<b>Family-owned</b>	<b>6721</b>	<b>69.10%</b>	<b>5082</b>	<b>61.60%</b>	<b>11803</b>	<b>65.70%</b>
<b>Branches of foreign companies</b>	1402	14.40%	1810	21.90%	3212	17.90%
<b>Cooperatives and Consortia</b>	549	5.60%	402	4.90%	951	5.30%
<b>Coalitions</b>	563	5.80%	304	3.70%	867	4.80%
<b>State-owned</b>	264	2.70%	335	4.10%	599	3.30%
<b>P.E. funds</b>	167	1.70%	237	2.90%	404	2.20%
<b>Controlled by banks and insurances</b>	41	0.40%	69	0.80%	110	0.60%
<b>Controlled by foundations</b>	13	0.10%	6	0.10%	19	0.10%
<b>Public companies</b>	7	0.10%	6	0.10%	13	0.10%
<b>Total</b>	<b>9727</b>	<b>100.00%</b>	<b>8251</b>	<b>100%</b>	<b>17978</b>	<b>100%</b>

Source: XII Osservatorio AUB. “Le imprese Familiari Italiane di Fronte alla Pandemia Covid-19”. 2021. <https://www.aidaf.it/wp-content/uploads/2021/01/26/Presentazione-XII-Osservatorio-AUB.pdf>

### 3 - Key Concepts

Appendix 3.1 – Table of Key Variables

Key Variable	Formula	Explanation
Return on Assets (ROA)	$\frac{EBIT}{Total\ Assets}$	Indicator of profitability independent of capital structure
Gross Sales Margin (GSM)	$\frac{Gross\ Profit}{Total\ Sales}$	Impact of variable costs
Asset Turnover (AT)	$\frac{Total\ Sales}{Total\ Assets}$	Efficiency in use of assets
Operating Risk (OR)	$\frac{EBIT}{Gross\ Profit}$	Impact of fixed costs
Days Sales Outstanding (DSO)	$\frac{Accounts\ Receivables}{Total\ Sales} \times 365$	Average number of days to collect payments of receivables
Days Inventory Outstanding (DIO)	$\frac{Inventory}{Total\ Sales} \times 365$	Average number of days to convert inventory into sales
Days Payables Outstanding (DPO)	$\frac{Account\ Payables}{COGS} \times 365$	Average number of days before payables are paid
Cash Conversion Cycle (CCC)	$DSO + DIO - DPO$	Length of time to convert cash investments in raw materials back into cash from sales
Debt-to-Equity Ratio	$\frac{Total\ Debt}{Total\ Equity}$	Proportion of equity and debt
Size	$\ln(Total\ Assets) ; \ln(Total\ Sales)$	Size Indicators

## 4 - Previous Literature on Family Businesses

### Appendix 4.1 – Profitability, Liquidity and Debt

Author	Family Business Defined by:	Objective of Research	Variables	Period	Findings
Allouche et al. (2008)	Equity ownership / Involvement in the management	Family ownership and financial performance	ROA, ROE, D/E, Gearing Ratio	1998 and 2003	FBs more profitable and less indebted than Non-FBs
Amann and Jaussaud (2011)	List of FBs obtained from Kurashina (2003)	Family business recover more easily from economic downturns	Current Ratio and Quick Ratio	1998, 2003 and 2007	Family Business keep higher liquidity than Non-FBs to allow for more operational flexibility
Anderson and Reeb (2003)	Equity ownership / the presence on the board	Family ownership and firm financial performance	ROA	1993-1999	FBs more profitable than Non-FBs due to their stewardship approach
Arrondo-Garcia, Fernández-Méndez and Menéndez-Requejo (2016)	2011 approved data from Bureat Van Dijk	Growth and Performance of FBs during Financial Crises	ROA, ROE, Total Assets, Total Debt	2006 and 2011	Second generations of FBs are more profitable than first generations. FBs tend to self finance but borrow more during period of crises
Blanco-Mazagatos et al. (2007)	Concentration of ownership by a Family	Family ownership and financial resources	Gearing Ratio	1999-2000	FBs take on more debt to preserve control
Chamochumbi Diaz (2016)	Equity ownership	Magnitude of family involvement and financial performance	ROE, ROA	2007-2014	FBs more profitable than Non-FBs
Culasso, Broccardo, Giacosa, and Mazzoleni (2012)	Presence of at least one family member in the board	Family ownership and firm financial performance	ROA, ROE, ROI, ROS, Current Ratio	2006-2010	FBs more profitable and more liquid than Non-FBs
Deloof (2003)	-	Relationship between CCC and profitability in non-financial belgian firms	Gross Operating Income, CCC, DIO, DSO, DPO	1992-1996	Negative impact of a longer CCC on profitability
Erbetta, Menozzi, Corbetta and Fraquelli (2013)	Equity ownership	Family ownership and financial performance	ROA, Overutilization index score	2001 - 2004	FBs more profitable than Non-FBs
J. Dieguez-Soto et al. (2015)	Equity ownership / presence on the board/ Involvement in the management	Identification of FBs and performance comparison with Non-FBs	ROE, Gearing Ratio	2002-2007	No difference in profitability, FBs rely more on internally generated finance
Machek, Hnilica and Kolouchová (2015)	Equity ownership / the presence on the board	Family ownership and financial performance	ROA, D/E, Cash Ratio	2007 and 2012	FBs more profitable and more liquid than Non-FBs
Mathuva	-	Effect of CCC components on corporate profitability of Kenyan companies	DSO, DIO, DPO, CCC, Net Operating Profit Ratio	1993-2008	A longer DIO and a shorter DSO have a positive relationship with profitability
Mazzola et al. (2008)	Equity ownership	Family ownership and financial performance	ROE, D/E, Sales Growth, Return on net asset growth	2000	FBs perform worse due to lack of skills
Muscettola (2014)	-	Impact of cash conversion cycle on the profitability of Italian SMEs	DSO, DIO, DPO, CCC, EBITDA/Total revenues	2007-2010	A longer DPO and a longer DSO have a positive impact on profitability
Provasi, Saracino and Riva (2019)	-	Relationship between CCC and profitability in the Italian textile industry	CCC, DSO, DIO, DPO, ROA, ROE, ROI	2013-2015	Increasing profitability is related to a shorter CCC
Richards and Laughling (1980)	-	Establishing CCC as a proper liquidity measure for WCM	CCC and Liquidity ratios	1975-1978	CCC is the most appropriate liquidity metric for WCM
Thompson, Lu-Andrews and Liang (2016)	Equity ownership / the presence on the board	Family ownership and liquidity	Cash Ratio, Quick Ratio, Current Ratio, Free Cash Flow, NWC	2008-2013	FBs hoard more liquid assets than NFBs

*Appendix 4.2 – Relationship with External Stakeholders*

<b>Author</b>	<b>Type of research:</b>	<b>Findings</b>
Miller and Le Breton-Miller (2006)	Qualitative	FBs invest in sustaining their relationship with suppliers and customers and as a result they outperform their peers and are more resilient during periods of crisis
Uhlener (2006)	Qualitative	FBs benefit from consolidated relationships with customer and supplier who are considered part of the family
Varaldo, Dalli, Resciniti & Tunisini (2009), FrancoAngeli Editore	Qualitative	The tight bond between the family and the firm determines a business continuity which is particularly appreciated by external third parties. It results in better conditions when dealing with suppliers and customers
Sciascia S. (2011), Giuffr� Editore	Qualitative	FBs weave strong relationships with all the external stakeholders with whom they interact, especially suppliers

## 5 – Methodology

### Appendix 5.1 – Initial sample

#	Company Name	Type of Activity
1	Abitare in S.p.A.	Real Estate Services
2	Aeffe S.p.A.	Manufacturer of Clothes
3	Aeroporto Guglielmo Marconi di Bologna	Airport
4	Alkemy S.p.A.	Business services
5	Amplifon S.p.A.	Wholesaler of acoustic devices
6	Antares Vision S.p.A.	Manufacturer of traceability systems
7	Aquafil S.p.A.	Manufacturer on nylon
8	Ascopiave S.p.A.	Manufacturer of gas plants
9	Avio S.p.A.	Manufacturer of space gear
10	B&C Speakers S.p.A.	Manufacturer of loudspeaker
11	Banca Finnat Euramerica S.p.A.	Financial
12	Banca IFIS S.p.A.	Financial
13	Banca Sistema S.p.A.	Financial
14	BB Biotech A.G.	Financial
15	Be S.p.A.	Business services
16	Biesse S.p.A.	Manufacturer of advanced materials
17	Cairo Communication S.p.A.	Communication services
18	Carel Industries S.P.A.	Manufacturer of cooling systems
19	Cellularline S.p.A.	Wholesaler of phone accessories
20	Cembre S.p.A.	Manufacturer of electric tools
21	Cementir Holding S.p.A.	Manufacturer of cement
22	Centrale del Latte d'Italia S.p.A.	Manufacturer of milk and milk derivatives
23	D'Amico International Shipping S.A.	Shipping services
24	Datalogic S.p.A.	Manufacturer of computers
25	DeA Capital S.p.A.	Financial
26	Digital Bros S.p.A.	wholesaler of videogames
27	El.En. S.p.A.	Manufacturer of laser products
28	Elica S.p.A.	Manufacturer of kitchen chimneys
29	Emak S.p.A.	Manufacturer of agriculture machines
30	Equita Group S.p.A.	Financial
31	Esprinet S.p.A.	cyber security services
32	Eurotech S.p.A.	Manufacturer of IoT tools
33	Falck Renewables S.p.A.	Manufacturer of renewable energy plants
34	Fiera Milano S.p.A.	Retail services
35	FILA S.p.A.	Manufacturer of visual arts products
36	Fine Foods and Pharmaceuticals spa	Manufacturer of medicinal products
37	Gefran S.p.A.	Manufacturer of sensors
38	Giglio Group S.p.A.	E-commerce services
39	Guala Closures S.P.A.	Manufacturer of closures
40	IGD SIIQ S.p.A.	Real Estate Retailer

To be continued

Appendix 5.1 continued

#	Company Name	Type of Activity
41	Illimity Bank S.p.A.	Financial
42	IMA S.p.A.	Manufacturer of industrial machines
43	Interpump Group S.p.A.	Manufacturer of engine pistons
44	Irce S.p.A.	Manufacture of electric tools
45	Isagro S.p.A.	Manufacturer of chemical product for agriculture
46	Italmobiliare S.p.A.	Real Estate Services
47	Ivs Group S.p.A.	Food services
48	La Doria S.p.A.	Manufacturer of tomato derivatives
49	Landi Renzo S.p.A.	Manufacturer of gas plants
50	MARR S.p.A.	Food services
51	Mondadori Editore S.p.A.	Communication services
52	Mondo TV S.p.A.	Communication services
53	MutuiOnline S.p.A.	Financial
54	Newlat Food S.p.A.	Manufacturer of milk and milk derivatives
55	Neodecortech	Manufacturer of interior design products
56	Openjobmetis S.p.A.	Employment services
57	Orsero S.p.A.	Manufacturer of fruit derivatives
58	Panariagroup Industrie Ceramiche S.p.	Manufacturer of ceramic
59	Pharmanutra S.p.A.	Manufacturer of food supplements
60	Piovan S.p.A.	Manufacturer of automation systems
61	Poligrafica San Faustino S.p.A.	Manufacturer of paper products
62	Prima Industrie S.p.A.	Manufacturer of laser products
63	Reno De Medici S.p.A.	Manufacturer of paper products
64	Reply S.p.A.	Digital services
65	Retelit S.p.A.	Business services
66	Sabaf S.p.A.	Manufacturer of domestic appliances
67	Saes Getters S.p.A.	Manufacturer of advanced materials
68	Salcef Group S.p.A.	Manufacturer of rail tracks
69	Sanlorenzo S.p.A.	Manufacturer of luxury yachts
70	Seco S.p.A.	Manufacturer of IOT products
71	Servizi Italia S.p.A.	Business services
72	Sesa S.p.A.	IT services
73	Sicit Group S.p.A.	Manufacturer of biostimulants
74	SOGEFI S.p.A.	Manufacturers of car components
75	Tamburi Investment Partners S.p.A.	Financial
76	Tesmec S.p.A.	Manufacturer transport maintenance products
77	Tinexta S.p.A.	Business services
78	TXT e-solutions S.p.A.	E-commerce services
79	Unieuro S.p.A.	Wholesaler of technology
80	Wit S.p.A.	IT services
81	Zignago Vetro S.p.A.	Manufacturer of glass
Total		81

Appendix 5.2 – Excluded companies

#	Excluded company	Reason for exclusion
1	Abitare in S.p.A.	Wholesaler / Services
2	Aeroporto Guglielmo Marconi di Bologna	Wholesaler / Services
3	Alkemy S.p.A.	Wholesaler / Services
4	Amplifon S.p.A.	Wholesaler / Services
5	Aquafil S.p.A.	Incomplete data
6	Ascopiave S.p.A.	Incomplete data
7	Banca Finnat Euramerica S.p.A.	Financial
8	Banca IFIS S.p.A.	Financial
9	Banca Sistema S.p.A.	Financial
10	BB Biotech A.G.	Financial
11	Be S.p.A.	Wholesaler / Services
12	Cairo Communication S.p.A.	Wholesaler / Services
13	Cellularline S.p.A.	Wholesaler / Services
14	Cementir Holding S.p.A.	Incomplete data
15	D'Amico International Shipping S.A.	Wholesaler / Services
16	DeA Capital S.p.A.	Financial
17	Digital Bros S.p.A.	Wholesaler / Services
18	Equita Group S.p.A.	Financial
19	Esprinet S.p.A.	Wholesaler / Services
20	Fiera Milano S.p.A.	Wholesaler / Services
21	Giglio Group S.p.A.	Wholesaler / Services
22	IGD SIIQ S.p.A.	Wholesaler / Services
23	Illimity Bank S.p.A.	Financial
24	Italmobiliare S.p.A.	Wholesaler / Services
25	Ivs Group S.p.A.	Wholesaler / Services
26	MARR S.p.A.	Wholesaler / Services
27	Mondadori Editore S.p.A.	Wholesaler / Services
28	Mondo TV S.p.A.	Wholesaler / Services
29	MutuiOnline S.p.A.	Financial
30	Openjobmetis S.p.A.	Wholesaler / Services
31	Orsero S.p.A.	Incomplete data
32	Prima Industrie S.p.A.	Incomplete data
33	Reply S.p.A.	Wholesaler / Services
34	Retelit S.p.A.	Wholesaler / Services
35	Servizi Italia S.p.A.	Wholesaler / Services
36	Sesa S.p.A.	Wholesaler / Services
37	Sicit Group S.p.A.	Incomplete data
38	Tamburi Investment Partners S.p.A.	Financial
39	Tinexta S.p.A.	Wholesaler / Services
40	TXT e-solutions S.p.A.	Wholesaler / Services
41	Unieuro S.p.A.	Wholesaler / Services
42	Wit S.p.A.	Wholesaler / Services
	Total	42

### 5.3 – Outliers

#	Company	Reason for Exclusion	Firm-year observations
1	Avio S.p.A.	z-score for DIO >  3	3
2	Panariagroup Industrie Ceramiche S.p.A.	z-score for DPO >  3	3
3	Pharmanutra S.p.A.	z-score for DPO >  3	3
Total companies	3	Total firm-year observations	9

### Appendix 5.4 – Final Sample

#	Company Name	Type of Activity
1	Aeffe S.p.A.	Manufacturer of Clothes
2	Antares Vision S.p.A.	Manufacturer of traceability systems
3	B&C Speakers S.p.A.	Manufacturer of loudspeaker
4	Biesse S.p.A.	Manufacturer of advanced materials
5	Carel Industries S.P.A.	Manufacturer of cooling systems
6	Cembre S.p.A.	Manufacturer of electric tools
7	Centrale del Latte d'Italia S.p.A.	Manufacturer of milk and milk derivatives
8	Datalogic S.p.A.	Manufacturer of computers
9	El.En. S.p.A.	Manufacturer of laser products
10	Elica S.p.A.	Manufacturer of kitchen chimneys
11	Emak S.p.A.	Manufacturer of agriculture machines
12	Eurotech S.p.A.	Manufacturer of IoT tools
13	Falck Renewables S.p.A.	Manufacturer of renewable energy plants
14	FILA S.p.A.	Manufacturer of visual arts products
15	Fine Foods and Pharmaceuticals spa	Manufacturer of medicinal products
16	Gefran S.p.A.	Manufacturer of sensors
17	Guala Closures S.P.A.	Manufacturer of closures
18	IMA S.p.A.	Manufacturer of industrial machines
19	Interpump Group S.p.A.	Manufacturer of engine pistons
20	Irce S.p.A.	Manufacture of electric tools
21	Isagro S.p.A.	Manufacturer of chemical product for agriculture
22	La Doria S.p.A.	Manufacturer of tomato derivatives
23	Landi Renzo S.p.A.	Manufacturer of gas plants
24	Newlat Food S.p.A.	Manufacturer of milk and milk derivatives
25	Neodecortech	Manufacturer of interior design products
26	Piovan S.p.A.	Manufacturer of automation systems
27	Poligrafica San Faustino S.p.A.	Manufacturer of paper products
28	Reno De Medici S.p.A.	Manufacturer of paper products
29	Sabaf S.p.A.	Manufacturer of domestic appliances
30	Saes Getters S.p.A.	Manufacturer of advanced materials
31	Salcef Group S.p.A.	Manufacturer of rail tracks
32	Sanlorenzo S.p.A.	Manufacturer of luxury yachts
33	Seco S.p.A.	Manufacturer of IOT products
34	SOGEFI S.p.A.	Manufacturers of car components
35	Tesmec S.p.A.	Manufacturer transport maintenance products
36	Zignago Vetro S.p.A.	Manufacturer of glass
	Total	36

## Appendix 5.5 – Identification of Family Businesses

Company	Website	Controlling Shareholder	Controlling Interest	Family members in the board	Family company
Aeffe	<a href="https://aeffe.com/it/">https://aeffe.com/it/</a>	Ferretti Family	62% **	Massimo Ferretti, Alberta Ferretti	YES
Antares Vision S.p.A	<a href="https://it.antaresvision.com">https://it.antaresvision.com</a>	Regolo SPA - Holding owned by Massimo Bonardi and Emilio Zorzella	63% *	NO	NO
B&C Speakers S.p.A.	<a href="https://www.bcspeakers.com">https://www.bcspeakers.com</a>	Research and development international - holding company owned by the founder Lorenzo Coppini	54% *	NO	NO
Biesse SPA	<a href="https://www.biessegroupp.com/it/">https://www.biessegroupp.com/it/</a>	Bi.Fin. Srl - Selci Family holding	51% *	Giancarlo Selci, Roberto Selci	YES
Carel Industries S.P.A.	<a href="https://ir.carel.com/it/azionariato/">https://ir.carel.com/it/azionariato/</a>	Luigi Rossi Luciani S.a.p.a. - Rossi Luciani Family Holding	36% *	Luigi Rossi luciani and Carlotta Rossi Luciani	YES
Cembre S.p.A.	<a href="https://www.cembre.it/group">https://www.cembre.it/group</a>	Lysne spa - Rosani family holding	53%**	Giovanni Rosani, Sara Rosani	YES
Centrale del Latte d'Italia S.p.A.	<a href="https://centralelatteitalia.com/">https://centralelatteitalia.com/</a>	Newlatfood spa - Family company controlled by Mastrolia Family	59% **	Angelo Mastrolia, Benedetta Mastrolia, Giuseppe Mastrolia	YES
Datalogic S.p.A.	<a href="https://www.datalogic.com/">https://www.datalogic.com/</a>	Volta Family	64% **	Romano Volta, Valentina Volta, Filippo Maria Volta	YES
El.En. S.p.A.	<a href="https://elengroup.com/it">https://elengroup.com/it</a>	Andrea Cangioli (founder)	14% **	NO	NO
Elica S.p.A.	<a href="https://www.elica.com/corporation/it">https://www.elica.com/corporation/it</a>	Francesco Casoli	53% **	NO	NO
Emak S.p.A.	<a href="https://www.emakgroup.it/it-it/">https://www.emakgroup.it/it-it/</a>	Yama - Multifamily Holding	65% **	Paola Becchi, Giuliano Ferrari, Vilmo Spaggiari, Guerrino Zambelli	YES
Eurotech S.p.A.	<a href="https://www.eurotech.com/en">https://www.eurotech.com/en</a>	BayWa Aktiengesellschaft	20% **	NO	NO
Falck Renewables S.p.A.	<a href="https://www.falckrenewables.com/it">https://www.falckrenewables.com/it</a>	Falck Family	67% **	Enrico Falck, Francesco Falck	YES
FILA S.p.A.	<a href="https://www.filagroup.it/">https://www.filagroup.it/</a>	Candela Family	32% **	Massimo Candela, Alberto Armando Candela	YES
FINE FOODS & PHARMACEUTICALS N.T.M. S.P.A.	<a href="https://www.finefoods.it/">https://www.finefoods.it/</a>	Marco Eigenmann - Chariman and CEO	44% **	NO	NO
Gefran S.p.A.	<a href="https://www.gefran.com/en">https://www.gefran.com/en</a>	Franceschetti Family	53% **	Maria Chiara Franceschetti, Ennio Franceschetti, Andrea Franceschetti, Giovanna Franceschetti	YES
Guala Closures S.P.A.	<a href="https://www.gualaclosures.com/">https://www.gualaclosures.com/</a>	GCL holding sca - luxembourg holding owned by the founder Marco Giovannini	24% *	NO	NO
IMA S.p.A.	<a href="https://ima.it/it/">https://ima.it/it/</a>	Vacchi Family	52% **	Marco Vacchi, Alberto Vacchi, Gianluca Vacchi	YES

To be continued

Appendix 5.5 continued

Company	Website	Controlling Shareholder	Controlling Interest	Family members in the board	Family company
Interpump Group S.p.A.	<a href="https://www.interpumpgroup.it/">https://www.interpumpgroup.it/</a>	Ipg holding srl	24% **	Fulvio Montipó, CEO	YES
Irce S.p.A.	<a href="https://www.irce.it/ita/">https://www.irce.it/ita/</a>	Aquafin spa	50% **	NO	NO
Isagro S.p.A.	<a href="https://www.isagro.com/">https://www.isagro.com/</a>	Crop Demetra - American holding company	51% **	NO	NO
La Doria S.p.A.	<a href="https://www.gruppolaoria.it/IT/csr/sostenibilita-ambientale.xhtml">https://www.gruppolaoria.it/IT/csr/sostenibilita-ambientale.xhtml</a>	Ferraioli Family	63% **	Antonio Ferraioli, Diodato Ferraioli	YES
Landi Renzo S.p.A.	<a href="https://www.landirenzogroup.com/it/">https://www.landirenzogroup.com/it/</a>	Landi Family	59% **	Stefano Landi, Silvia Landi	YES
Neodecortech	<a href="https://www.neodecortech.it/">https://www.neodecortech.it/</a>	Finanziaria Valentini holding	59% *	NO	NO
Newlat Food S.p.A.	<a href="https://www.newlat.it/">https://www.newlat.it/</a>	Angelo Mastroia	62% **	Angelo Mastroia, Benedetta Mastroia, Giuseppe Mastroia	YES
Piovan S.p.A.	<a href="https://www.piovan.com/it">https://www.piovan.com/it</a>	Pentafin spa - Holding Piovan family	59% **	Nicola Piovan, CEO	YES
POLIGRAFICA S.FAUSTINO S.P.A.	<a href="https://www.psf.it/">https://www.psf.it/</a>	Frigoli Family	48% *	SI	YES
Reno De Medici S.p.A.	<a href="https://rdmgroup.com/it/">https://rdmgroup.com/it/</a>	Rimini Bidco - Spac company affiliated to Apollo Global Management	67% *	NO	NO
Sabaf S.p.A.	<a href="https://www.sabaf.it/">https://www.sabaf.it/</a>	Quaestio Capital Management SGR S.p.A. - Independent Asset Manager	35% *	Cinzia Saleri	NO
Saes Getters S.p.A.	<a href="https://www.saesgetters.com/it">https://www.saesgetters.com/it</a>	Della Porta Family	60% *	Massimo della Porto, Luigi della Porta, Alessandra della porta	YES
Salcef Group spa	<a href="https://www.salcef.com/it/">https://www.salcef.com/it/</a>	Finhold srl - Holding Salsiccia Family	65% *	Valeriano Salsiccia, Gilberto Salsiccia	YES
sanlorenzo spa	<a href="https://www.sanlorenzoyacht.com/it/index.asp">https://www.sanlorenzoyacht.com/it/index.asp</a>	Massimo Perotti Holding	60% *	Massimo Perotti, Cecilia Perotti	YES
Seco spa	<a href="https://www.seco.com/it">https://www.seco.com/it</a>	DSA srl, HSE srl	40% *	NO	NO
SOGEFI S.p.A.	<a href="https://www.sogefigroup.com/it/index.html">https://www.sogefigroup.com/it/index.html</a>	CIR - Compagnie Industriali Riunite	56% *	NO	NO
Tesmec S.p.A.	<a href="https://www.tesmec.com/it">https://www.tesmec.com/it</a>	TTC srl - Holding Caccia Dominioni Family	31% **	Ambrogio Caccia Dominioni, Caterina Caccia Dominioni, Lucia Caccia Dominioni	YES
Zignago Vetro S.p.A.	<a href="https://zignagovetro.com/">https://zignagovetro.com/</a>	Zignago Holding - Marzotto Family	65% *	Luca Marzotto, Stefano Marzotto, Nicolo Marzotto	YES

\* data retrieved from corporate website

\*\* data retrieved from other sources (Market Screener, BeBeez, Wikipedia etc.)

*Appendix 5.6 – List of Family Businesses and Non-Family Businesses*

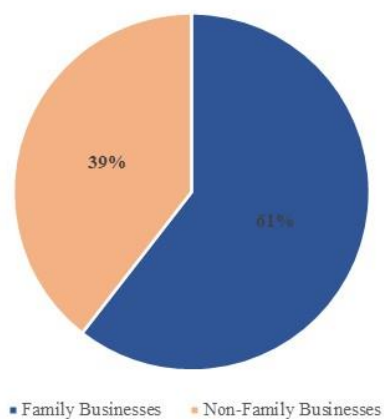
<b>FBs</b>
Aeffe
Biesse SPA
Carel Industries S.P.A.
Cembre S.p.A.
Centrale del Latte d'Italia S.p.A.
Datalogic S.p.A.
Emak S.p.A.
Falck Renewables S.p.A.
FILA S.p.A.
Gefran S.p.A.
IMA S.p.A.
Interpump Group S.p.A.
La Doria S.p.A.
Landi Renzo S.p.A.
Newlat Food S.p.A.
Piovan S.p.A.
POLIGRAFICA S.FAUSTINO S.P.A.
Saes Getters S.p.A.
Salcef Group spa
sanlorenzo spa
Tesmec S.p.A.
Zignago Vetro S.p.A.

<b>Non-FBs</b>
Antares Vision S.p.A
B&C Speakers S.p.A.
El.En. S.p.A.
Elica S.p.A.
Eurotech S.p.A.
FINE FOODS & PHARMACEUTICALS N.T.M. S.P.A.
Guala Closures S.P.A.
Irce S.p.A.
Isagro S.p.A.
Neodecortech
Reno De Medici S.p.A.
Sabaf S.p.A.
Seco spa
SOGEFI S.p.A.

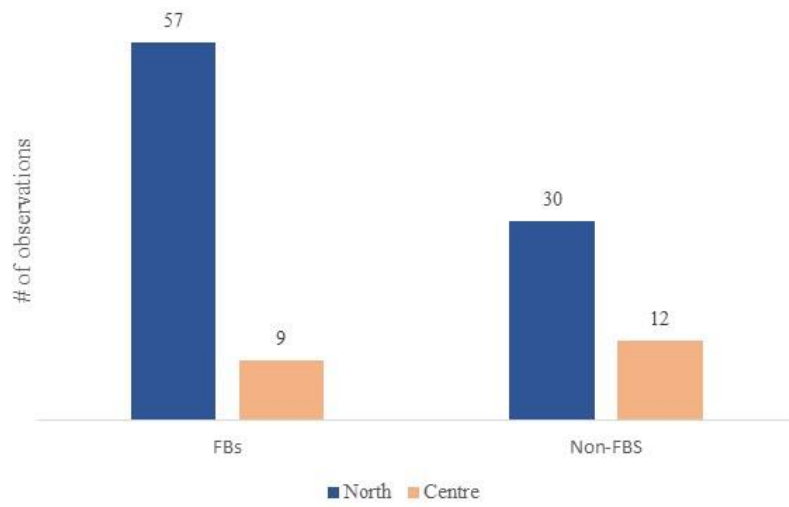
*Appendix 5.7 – Firm-Year observations Crosstab*

	FBS	Non-FBS	Total
2018	22	14	36
2019	22	14	36
2020	22	14	36
Total	66	42	108

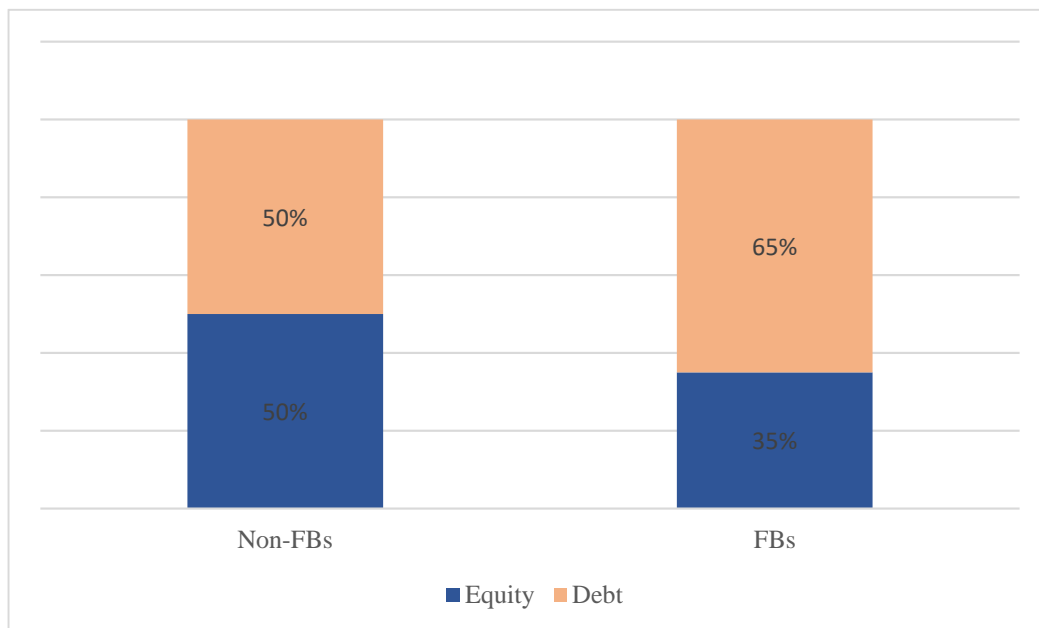
*Appendix 5.8 – Sample composition: FBs vs Non-FBs*



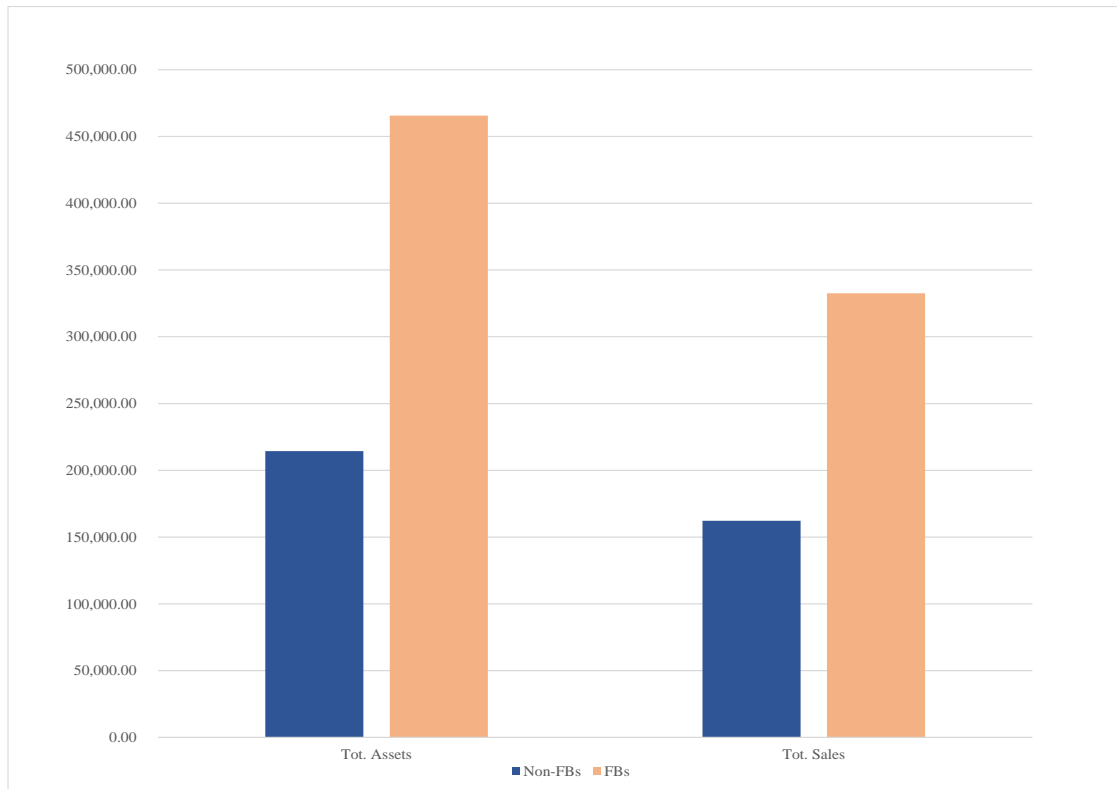
*Appendix 5.9 – Regional Distribution of FBs and Non-FBs*



*Appendix 5.10 - Capital Structure of FBs and Non-FBs*



*Appendix 5.11 – Median Size of FBs and Non-FBs (period 2018-2020) \**



\*Values in thousands of euros

*Appendix 5.12 – Definition of Manufacturing*

*“The manufacturing sector, as defined by the U.S. government, “comprises establishments engaged in the mechanical, physical, or chemical transformation of materials, substances, or components into new products,” as well as those engaged in “assembling of component parts of manufactured products” for purposes other than construction. Typically, the Census Bureau notes, manufacturing establishments are referred to as plants, factories, or mills.”*

Levinson M., “What Is Manufacturing? Why Does the Definition Matter?”, 2017, Congressional Research Service

*Appendix 5.13 – Areas of economic activity*

<b>RAE code starting with:</b>	<b>Area of economic activity</b>
2	Mineral products and chemicals
3	Production and processing of metal products, agriculture machines, office machines, electric materials and transportation means
4	Food and beverage, fabric products, leather, footwear and apparel, paper and press products, plastic and gum
5	Public works

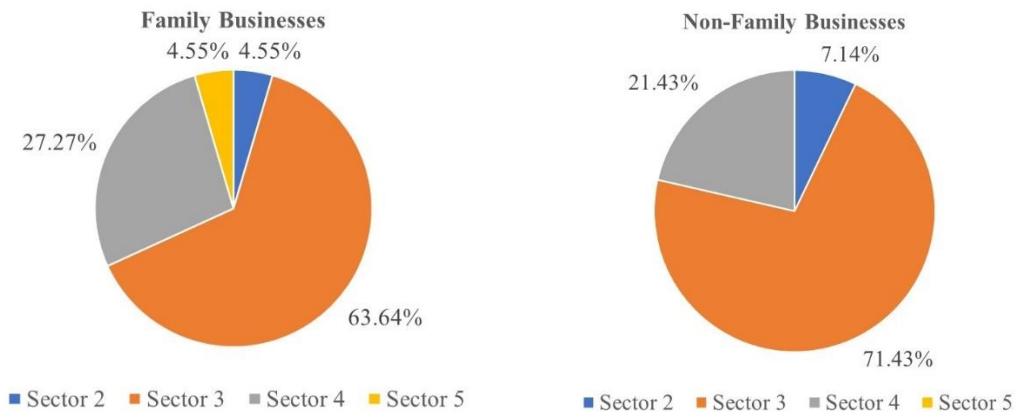
*Appendix 5.14 – Sample companies with Respective Area of Economic Activity*

Company	Area of economic activity	RAE code	Industrial activity
Aeffe	4	453	Apparel and accessories
Antares Vision S.p.A	3	371	Precision devices
B&C Speakers S.p.A.	3	345	Electronic devices
Biesse SPA	3	322	Machinery for metalworking
Carel Industries S.P.A.	3	371	Precision devices
Cembre S.p.A.	3	342	Electric devices
Centrale del Latte d'Italia S.p.A.	4	413	Milk and milk derivatives
Datalogic S.p.A.	3	330	Office machinery and data elaboration
El.En. S.p.A.	3	344	electro-medical devices
Elica S.p.A.	3	346	electro-domestical devices
Emak S.p.A.	3	321	Machines for agricultures
Eurotech S.p.A.	3	330	Office machinery and data elaboration
Falck Renewables S.p.A.	3	343	Electric devices
Piovan S.p.A.	3	324	Machinery for the plastic industry
FILA S.p.A.	4	495	Stationery items
FINE FOODS & PHARMACEUTICALS N.T.M. S.P.A.	4	423	Homogenized and dietitic foods
Gefran S.p.A.	3	343	Electric devices
Guala Closures S.P.A.	3	316	Light metal packaging
IMA S.p.A.	3	324	electromechanical items
Interpump Group S.p.A.	3	328	Hydraulic machinery
Irce S.p.A.	3	341	Electric wires
Isagro S.p.A.	2	256	chemical products for agriculture
La Doria S.p.A.	4	414	Preserved foods
Landi Renzo S.p.A.	3	353	Components for motor vehicles
Neodecortech	4	473	Paper and cardboard
Newlat Food S.p.A.	4	413	Milk and milk derivatives
POLIGRAFICA S.FAUSTINO S.P.A.	4	473	press and printing accessories
Reno De Medici S.p.A.	4	471	Paper derivatives
Sabaf S.p.A.	3	328	Gas cookers
Saes Getters S.p.A.	3	345	Electronic devices
Salcef Group spa	5	507	Railways
sanlorenzo spa	3	361	Pleasure and sporting boats
Seco spa	3	345	Electronic devices
SOGEFI S.p.A.	3	353	Components for motor vehicles
Tesmec S.p.A.	3	325	Motor vehicles for transportation
Zignago Vetro S.p.A.	2	247	Glass and glass derivatives

*Appendix 5.15 – Crosstabulation Family Businesses – Area of economic activity*

		Non-FBs	FBs	Total
Sector	2	3	3	6
	3	30	42	72
	4	9	18	27
	5	0	3	3
Total		42	66	108

Appendix 5.16 – Pie chart: Areas of Economic Activity per FBs and Non-FBs



Appendix 5.17 – Research Questions and Statistical Tools

#RQ	Object	Type of Analysis	Statistical Tool
RQ1	Difference in profitability between FBs and Non-FBs	Univariate	Independent sample T-test/K-independent samples test
RQ2	Difference in CCC between FBs and Non-FBs	Univariate	Independent sample T-test/K-independent samples test
RQ3	Correlation between CCC and profitability	Bivariate	Person and Spearman Correlation Coefficients
RQ4	Impact of CCC on GSM	Multivariate	OLS regression

Appendix 5.18 – Shapiro-Wilk test of normality

	Shapiro-Wilk		
	Statistic	df	Sig.
DIO*	0.891	108	<0.001
DSO*	0.974	108	0.030
DPO*	0.755	108	<0.001
CCC*	0.968	108	0.011
Gross Margin	0.978	108	0.071
Asset Turnover	0.985	108	0.253
Operating Risk*	0.975	108	0.039
ROA*	0.940	108	<0.001

\* It is possible to reject the null hypothesis of normality

## Appendix 6 – Descriptive Statistics

### Appendix 6.1 – ROA and ROA drivers across FBs and Non-FBs (2018-2020)

	N	Median	Mean	St. Dev.	Skewness		Kurtosis	
					Stat.	Std. Error	Stat.	Std. Error
<b>FBs</b>								
GSM	66	0.60	0.60	0.14	0.04	0.29	0.13	0.58
AT	66	0.77	0.78	0.26	-0.03	0.29	-0.12	0.58
OR	66	0.15	0.15	0.10	-0.44	0.29	0.23	0.58
ROA	66	0.06	0.04	0.04	-0.12	0.29	-0.20	0.58
<b>Non-FBs</b>								
GSM	42	0.48	0.48	0.11	-0.39	0.37	0.82	0.72
AT	42	0.86	0.90	0.34	0.14	0.37	-0.73	0.72
OR	42	0.13	0.15	0.13	-0.27	0.37	2.70	0.72
ROA	42	0.05	0.07	0.06	1.50	0.37	3.01	0.72

### Appendix 6.2 – YOY ROA and ROA drivers over time across FBs and non-FBs

	2018				2019				2020			
	N	Median	Mean	St. Dev.	N	Median	Mean	St. Dev.	N	Median	Mean	St. Dev.
<b>FBs</b>												
GSM	22	0.60	0.60	0.14	22	0.61	0.60	0.14	22	0.60	0.60	0.15
AT	22	0.88	0.85	0.27	22	0.77	0.80	0.26	22	0.65	0.70	0.24
OR	22	0.17	0.16	0.09	22	0.16	0.16	0.08	22	0.13	0.12	0.12
ROA	22	0.07	0.08	0.04	22	0.06	0.07	0.04	22	0.05	0.05	0.05
<b>Non-FBs</b>												
GSM	14	0.48	0.47	0.10	14	0.47	0.48	0.12	14	0.51	0.51	0.13
AT	14	0.93	0.96	0.39	14	0.87	0.91	0.33	14	0.86	0.83	0.31
OR	14	0.16	0.18	0.12	14	0.12	0.14	0.17	14	0.13	0.14	0.08
ROA	14	0.06	0.08	0.07	14	0.05	0.07	0.07	14	0.05	0.06	0.04

### Appendix 6.3 – CCC and CCC components (in days) across FBs and Non-FBs (2018-2020)

	N	Median	Mean	St. Dev.	Skewness		Kurtosis	
					Stat.	Std. Error	Stat.	Std. Error
<b>FBs</b>								
DSO	66	106	106	32.55	0.39	0.29	-0.09	0.58
DIO	66	233	249	160.07	1.00	0.29	1.03	0.58
DPO	66	184	219	137.40	2.02	0.29	4.02	0.58
CCC	66	129	136	156.91	-0.68	0.29	1.57	0.58
<b>Non-FBs</b>								
DSO	42	91	99	41.49	0.67	0.37	0.05	0.72
DIO	42	166	170	73.22	0.70	0.37	0.91	0.72
DPO	42	125	133	74.55	2.94	0.37	14.09	0.72
CCC	42	145	136	100.55	0.17	0.37	-0.37	0.72

Appendix 6.4 – YoY CCC and CCC components (in days) over time across FBs and non-FBs

	2018				2019				2020			
	N	Median	Mean	St. Dev.	N	Median	Mean	St. Dev.	N	Median	Mean	St. Dev.
<b>FBs</b>												
DSO	22	104	107	28	22	106	104	31	22	104	107	39
DIO	22	214	246	180	22	251	244	147	22	217	255	159
DPO	22	186	229	162	22	182	215	132	22	183	212	122
CCC	22	133	125	178	22	120	133	149	22	126	150	147
<b>Non-FBs</b>												
DSO	14	91	105	46	14	82	92	37	14	101	99	44
DIO	14	179	173	75	14	159	160	58	14	166	179	87
DPO	14	124	127	56	14	118	118	44	14	130	153	109
CCC	14	165	151	98	14	145	133	91	14	133	125	117

Appendix 6.5 – Debt over time across FBs and Non-FBs

	2018				2019				2020			
	N	Median	Mean	St. Dev.	N	Median	Mean	St. Dev.	N	Median	Mean	St. Dev.
<b>FBs</b>												
D/E	22	0.88	0.86	0.64	22	0.88	1.01	0.69	22	1.02	~1.12	0.68
STD % tot. assets	22	0.11	0.11	0.06	22	0.10	0.12	0.07	22	0.12	0.13	0.04
LTD% tot.assets	22	0.16	0.16	0.10	22	0.19	0.20	0.11	22	0.22	0.22	0.10
<b>Non-FBs</b>												
D/E	14	0.59	0.52	0.30	14	0.60	0.58	0.33	14	0.68	0.69	0.57
STD % tot. assets	14	0.06	0.09	0.07	14	0.07	0.10	0.07	14	0.04	0.08	0.05
LTD% tot.assets	14	0.09	0.13	0.09	14	0.08	0.14	0.08	14	0.10	0.17	0.10

Appendix 6.6 –Size over time across FBs and Non-FBs

	2018				2019				2020			
	N	Median	Mean	St. Dev.	N	Median	Mean	St. Dev.	N	Median	Mean	St. Dev.
<b>FBs</b>												
Tot. Assets*	22	419,318.00	529,942.13	448,018.78	22	437,969.50	612,276.74	550,340.65	22	519,732.50	665,164.14	584,064.29
Tot. Revenues*	22	306,960.00	389,092.73	292,839.38	22	332,540.00	415,251.46	313,021.41	22	347,353.00	415,194.00	313,819.40
<b>Non-FBs</b>												
Tot. Assets*	14	380,685.00	354,916.49	380,685.19	14	424,836.70	393,538.84	424,836.75	14	410,454.00	406,020.21	410,454.01
Tot. Revenues*	14	415,771.00	325,029.83	415,771.94	14	404,866.67	357,635.63	404,866.68	14	323,846.90	330,248.71	323,846.94

\*values in thousands of €

Appendix 6.7–Static Liquidity<sup>37</sup> Composition across FBs and Non-FBs over time

	2018				2019				2020			
	N	Median	Mean	St. Dev.	N	Median	Mean	St. Dev.	N	Median	Mean	St. Dev.
<b>FBs</b>												
Cash % liquidity	22	0.19	0.24	0.16	22	0.23	0.23	0.10	22	0.29	0.29	0.13
Rec. % of liquidity	22	0.41	0.43	0.13	22	0.4	0.40	0.11	22	0.36	0.35	0.09
Inv. % of liquidity	22	0.37	0.33	0.17	22	0.35	0.33	0.15	22	0.31	0.30	0.15
STI % of liquidity	22	0.00	0.00	0.01	22	0.00	0.04	0.10	22	0.00	0.05	0.10
<b>Non-FBs</b>												
Cash % liquidity	14	0.16	0.19	0.14	14	0.18	0.21	0.12	14	0.27	0.25	0.14
Rec. % of liquidity	14	0.43	0.42	0.07	14	0.38	0.38	0.09	14	0.34	0.36	0.11
Inv. % of liquidity	14	0.35	0.37	0.09	14	0.32	0.34	0.11	14	0.30	0.31	0.12
STI % of liquidity	14	0.00	0.02	0.05	14	0.00	0.07	0.17	14	0.00	0.07	0.17

<sup>37</sup> This table shows liquidity ratios according to a static approach, therefore only considering balance sheet itmes.

## Appendix 7 – Results

### Appendix 7.1 – P-values t-test and median test

	Mean		Median FBs		P-value (mean)	P-value (median)	Significant
	FBs	Non-FBs	FBs	Non-FBs			
GSM	0.60	0.48	0.60	0.48	<0.001	<0.001	Yes
AT	0.78	0.90	0.77	0.86	0.06	0.24	No
OR	0.15	0.15	0.15	0.13	0.75	0.24	No
ROA	0.06	0.07	0.06	0.05	0.78	0.43	No
DSO	106	99	106	91	0.31	0.24	No
DIO	249	170	233	166	<0.001	0.05	Yes
DPO	219	133	184	125	<0.001	<0.001	Yes
CCC	136	136	129	145	0.99	0.43	No

### Appendix 7.2 – Difference in mean COGS/Total Sales across FBs and Non-FBs

	Mean		Median FBs		P-value (mean)	P-value (median)	Significant
	FBs	Non-FBs	FBs	Non-FBs			
COGS/TOT. SALES	0.39	0.52	0.39	0.52	<0.001	<0.001	Yes

To provide robustness to the conclusion proposed in RQ1 – i.e., FBs are able to pay lower prices to their suppliers – it is possible to verify for differences in mean as to COGS/Tot.Sales. The median and the mean values are the same value, suggesting that the variable is normally distributed. FBs show an impact of variable cost 13 percentage points lower than for Non-FBs and both the differences in mean and median are significant at a 99% confidence level. Hence, it is possible to back the conclusion that FBs deal lower prices with their suppliers.

Appendix 7.3 – Pearson and Spearman correlation coefficients for FBs

FBs												
	DSO	DIO	DPO	CCC	ROA	AT	GSM	OR	D/E	LNAssets	LNSales	DPO-DSO
<b>DSO</b>	1	0.04	0.399	-0.102	-0.216	-0.366	0.162	-0.074	0.571	-0.105	-0.31	0.174
		0.753	<0.001	0.417	0.081	0.003	0.195	0.557	<0.001	0.403	0.011	0.162
<b>DIO</b>	0.04	1	0.404	0.674	0.309	-0.333	0.535	0.182	-0.225	0.313	0.313	0.424
	0.751		<0.001	<0.001	0.012	0.006	<0.001	0.144	0.069	0.010	0.010	<0.001
<b>DPO</b>	0.438	0.202	1	-0.38	0.092	-0.284	0.622	0.151	-0.023	0.179	0.002	0.972
	<0.001	0.104		0.002	0.462	0.021	<0.001	0.225	0.854	0.150	0.990	<0.001
<b>CCC</b>	-0.044	0.808	-0.307	1	0.190	-0.167	0.035	0.038	-0.091	0.141	0.174	-0.383
	0.726	<0.001	0.012		0.127	0.181	0.783	0.762	0.468	0.260	0.162	0.002
<b>ROA</b>	-0.152	0.263	-0.142	0.224	1	0.069	0.361	0.83	-0.561	0.188	0.258	0.154
	0.223	0.033	0.254	0.07		0.579	0.003	<0.001	<0.001	0.132	0.037	0.217
<b>AT</b>	-0.354	-0.487	-0.117	-0.419	0.058	1	-0.647	-289	-0.133	-0.471	-0.042	-0.212
	0.004	<0.001	0.351	<0.001	0.646		<0.001	0.019	0.287	<0.001	0.739	0.087
<b>GSM</b>	0.126	0.592	0.375	0.261	0.447	-0.565	1	0.434	-0.332	0.334	0.034	0.627
	0.313	<0.001	0.002	0.034	<0.001	<0.001		<0.001	0.006	0.006	0.787	<0.001
<b>OR</b>	-0.027	0.202	-0.216	0.198	0.837	-0.289	0.47	1	-0.372	0.429	0.314	0.181
	0.83	0.103	0.081	0.111	<0.001	0.019	<0.001		0.002	<0.001	0.010	0.145
<b>D/E</b>	0.449	-0.268	0.069	-0.145	-0.555	-0.183	-0.488	-0.301	1	-0.177	-0.271	-0.170
	<0.001	0.029	0.582	0.247	<0.001	0.141	<0.001	0.014		0.156	0.028	0.172
<b>LNAssets</b>	-0.092	0.323	0.006	0.230	0.141	-0.388	0.245	0.376	-0.060	1	0.891	0.219
	0.463	0.008	0.959	0.063	0.259	0.001	0.047	0.002	0.632		<0.001	0.077
<b>LNSales</b>	-0.263	0.223	-0.074	0.179	0.220	0.00	0.014	0.279	-0.149	0.895	1	0.080
	0.033	0.073	0.554	0.150	0.076	0.975	0.914	0.023	0.233	<0.001		0.521
<b>DPO-DSO</b>	0.128	0.130	0.899	-0.407	-0.127	-0.057	0.433	-0.213	-0.103	0.019	-0.050	1
	0.305	0.299	<0.001	0.001	0.308	0.648	<0.001	0.086	0.413	0.881	0.689	

Pearson correlation coefficients are reported in the upper-right triangle; Spearman correlation coefficients are reported in the bottom-left triangle. Significant coefficients at 95% confidence level are marked in grey.

Appendix 7.4 – Pearson and Spearman correlation coefficients for Non-Family Businesses

Non-FBs												
	DSO	DIO	DPO	CCC	ROA	AT	GSM	OR	D/E	LNAssets	LNSales	DPO-DSO
<b>DSO</b>	1	0.752	0.505	0.586	0.138	-0.566	0.327	0.283	0.006	-0.218	-0.475	-0.060
		<0.001	<0.001	<0.001	0.384	<0.001	0.035	0.069	0.969	0.165	0.001	0.706
<b>DIO</b>	0.779	1	0.364	0.768	0.192	-0.587	0.466	0.275	-0.109	-0.433	-0.681	-0.0627
	0.001		0.018	<0.001	0.224	<0.001	0.002	0.078	0.492	0.004	<0.001	0.69302
<b>DPO</b>	0.241	0.226	1	-268	-0.051	-0.378	0.582	0.037	0.222	0.233	0.028	0.832
	0.125	0.149		0.086	0.748	0.014	<0.001	0.815	0.157	0.137	0.862	<0.001
<b>CCC</b>	0.714	0.762	-0.24	1	0.234	-0.381	0.042	0.29	-242	-0.578	-0.712	-0.687
	<0.001	<0.001	0.126		0.135	0.013	0.79	0.063	0.123	<0.001	<0.001	<0.001
<b>ROA</b>	0.164	0.279	0.04	0.122	1	0.163	0.346	0.881	-0.294	-0.452	-0.318	-0.1476
	0.298	0.074	0.8	0.44		0.302	0.025	<0.001	0.059	0.003	0.0405	0.35099
<b>AT</b>	-0.531	-0.581	-0.18	-0.373	0.127	1	-0.456	-0.076	-0.037	0.033	0.47	-0.0729
	<0.001	<0.001	0.253	0.015	0.0423		0.02	0.633	0.814	0.835	0.002	0.64631
<b>GSM</b>	0.292	0.453	0.346	0.11	0.279	-0.352	1	0.278	0.05	0.095	-0.114	0.463
	0.06	0.003	0.025	0.489	0.074	0.022		0.075	0.751	0.548	0.472	0.00203
<b>OR</b>	0.379	0.465	-0.104	0.4	0.848	-0.223	0.175	1	-0.303	-0.447	-0.421	-0.1391
	0.13	0.002	0.513	0.009	<0.001	0.155	0.267		0.051	0.003	0.006	0.37981
<b>D/E</b>	0.075	-0.016	0.321	-0.211	-0.342	-0.093	0.065	-0.366	1	0.369	0.321	0.25315
	0.637	0.92	0.038	0.181	0.027	0.558	0.682	0.017		0.016	0.038	0.10575
<b>LNAssets</b>	-0.252	-0.501	0.335	-0.601	-0.372	0.142	0.130	-0.514	0.277	1	0.89	0.41
	0.108	0.001	0.030	<0.001	0.015	0.368	0.412	<0.001	0.075		<0.001	0.00699
<b>LNSales</b>	-0.509	-0.716	0.186	-0.706	-0.308	0.461	-0.047	-0.542	0.179	0.914	1	0.337
	0.001	<0.001	0.239	<0.001	0.047	0.002	0.767	<0.001	0.257	<0.001		<0.001
<b>DPO-DSO</b>	-0.433	-0.295	0.706	-0.765	-0.073	0.070	0.220	-0.299	0.289	0.509	0.492	1
	0.004	0.058	<0.001	<0.001	0.645	0.660	0.162	0.054	0.063	0.001	0.001	

Pearson correlation coefficients are reported in the upper-right triangle; Spearman correlation coefficients are reported in the bottom-left triangle. Significant coefficients at 95% confidence level are marked in grey.

*Appendix 7.5 – Correlation between CCC and COGS across FBs and Non-FBs*

<b>FBs</b>				<b>Non-FBs</b>			
	<b>DPO-DSO</b>	<b>DPO</b>	<b>COGS</b>		<b>DPO-DSO</b>	<b>DPO</b>	<b>COGS</b>
<b>DPO-DSO</b>	1	0.706	0.414	<b>DPO-DSO</b>	1	0.832	0.196
		<0.001	0.006			<0.001	0.212
<b>DPO</b>	0.899	1	0.068	<b>DPO</b>	0.706	1	
	<0.001		0.67		<0.001		
<b>COGS</b>	-0.293	-0.31	1	<b>COGS</b>	0.414	0.068	1
	0.017	0.011			0.006	0.67	

Pearson correlation coefficients are reported in the upper-right triangle; Spearman correlation coefficients are reported in the bottom-left triangle. Significant coefficients at 95% confidence level are marked in grey.

This study has also performed a bivariate analysis to control the correlation between the bargaining power of FBs and Non-FBs – proxied by DPO-DSO and DPO – and COGS.

The results obtained deliver a soundproof that the higher bargaining power of FBs allows them to enjoy lower prices from their suppliers. In fact, for FBs, the spearman correlation between DPO-DSO and COGS is significant but positive ( $p=0.006$ ). Therefore, Non-FBs that exercise more bargaining power on their stakeholders end up swapping higher prices for payment delays. Conversely, FBs show a significant negative correlation between DPO-DSO and COGS ( $p<0.001$ ). Robustness to this result is provided by a likewise negative significant correlation between DPO and COGS ( $p=0.011$ ).

Hence, while Non-FBs incur in higher prices to obtain longer payable period, FBs that are able to bargain longer DPOs with their suppliers are also able to obtain lower prices and, eventually, a better GSM.

*Appendix 7.6 – Correlation between DPO and liquidity ratios across FBs and Non-FBs*

FBs					Non-FBs				
	DPO	Current Ratio	Quick Ratio	NWC		DPO	Current Ratio	Quick Ratio	NWC
<b>DPO</b>	1	-0.279	-0.100	-0.355	<b>DPO</b>	1	-0.212	-0.026	-0.0743
		0.023	0.426	0.003			0.177	0.868	0.640
<b>Current Ratio</b>	-0.486	1	0.803	0.504	<b>Current Ratio</b>	-0.563	1	0.936	0.529
	<0.001		<0.001	<0.001		<0.001		<0.001	<0.001
<b>Quick Ratio</b>	-0.288	0.772	1	0.142	<b>Quick Ratio</b>	-0.460	0.931	1	0.369
	0.019	<0.001		0.256		0.002	<0.001		0.016
<b>NWC</b>	-0.532	0.673	0.22	1	<b>NWC</b>	-0.329	0.589	0.534	1
	<0.001	<0.001	0.076			0.033	<0.001	<0.001	

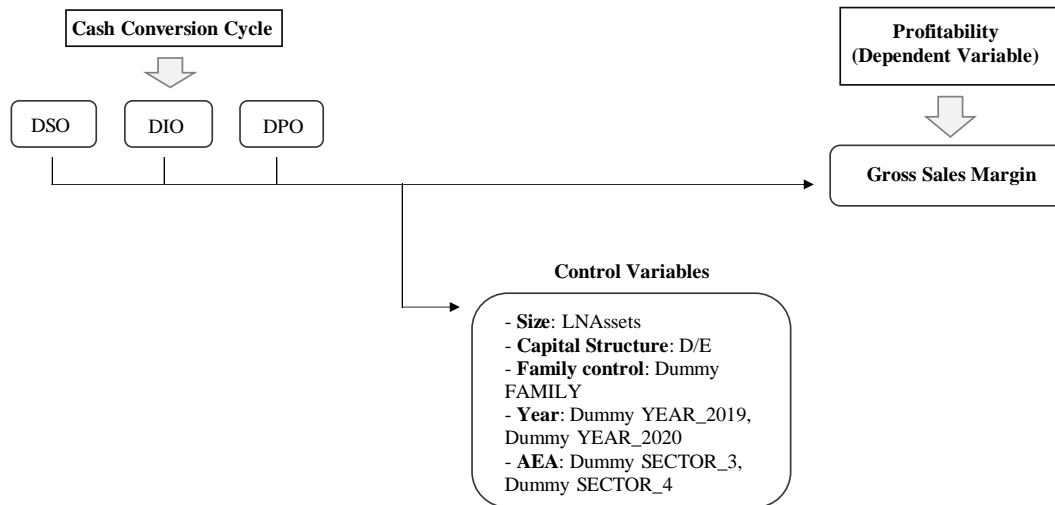
Pearson correlation coefficients are reported in the upper-right triangle of each table; Spearman correlation coefficients are reported in the bottom-left triangle. Significant coefficients at 95% confidence level are marked in grey.

The Pearson and Spearman correlation coefficients between DPO and liquidity ratios provide robustness to the conclusion that FBs exploit their longer DPO to pursue short-term investment purposes. Specifically, for FBs, the spearman coefficients indicate that an increase in DPO is associated with a decrease in current ratio, quick ratio and NWC. Therefore, the argument that FBs exploit their longer payable period to finance operations through their liquidity can be considered solid. The Pearson correlation seems to confirm this result even though the coefficient for the quick ratio becomes insignificant.

For Non-FBs the association between liquidity and DPO is less strong as it is only significant for the Spearman correlation, while no significant coefficient appears for the Pearson correlation. Nonetheless, the non-normal distribution of DPO makes the Spearman correlation more reliable, suggesting that also Non-FBs invest their internal liquidity more when they have longer DPO.

In this case, the pivotal factor to understand the difference between FBs and Non-FBs is the magnitude of the difference in DPO: by being able to wait 60 days more to pay their suppliers, FBs use more internal liquidity to finance their operations when compared to Non-FBs.

## Appendix 7.7 – Research Model and Model Summary



Model Summary						
Durbin-Watson	Max VIF	R-squared	F	Sig.	n	k
2.025	2.992	0.614	15.4	<0.001	108	10

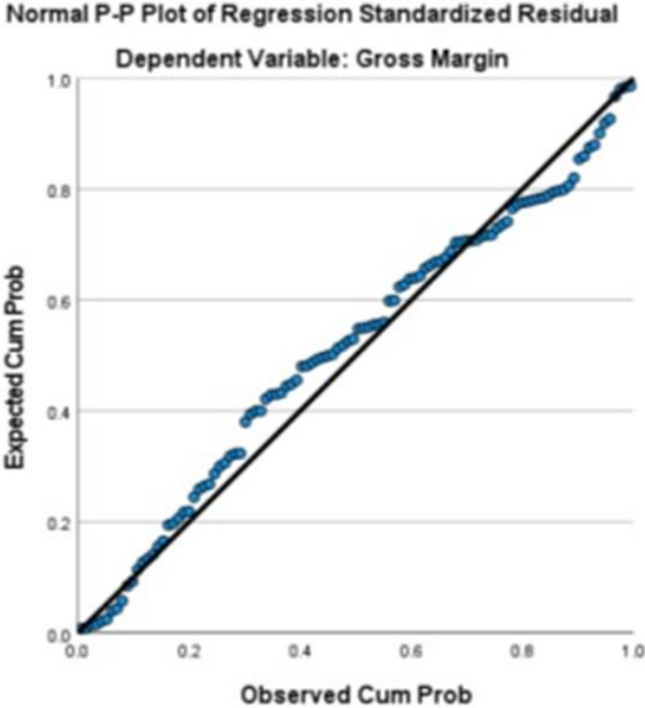
## Appendix 7.8 – Regression Coefficients

Dependent Variable: GSM

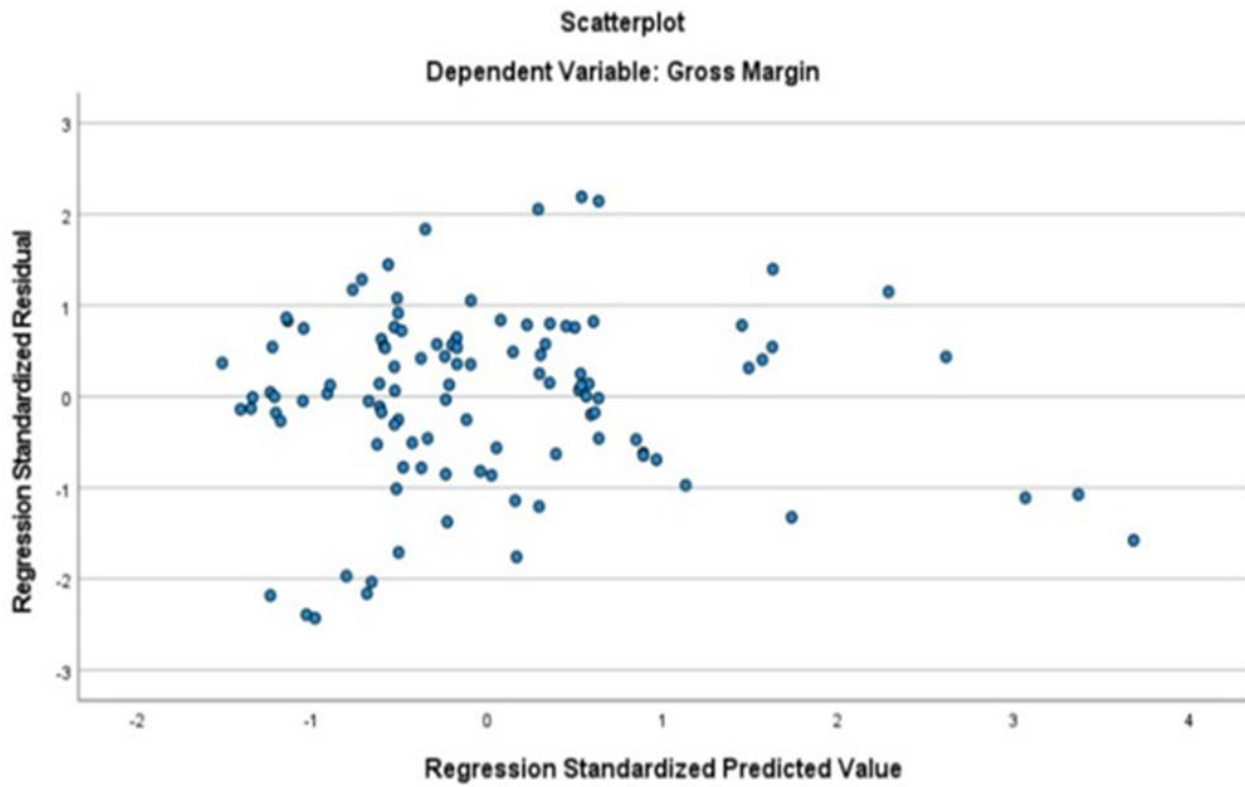
	Constant	DSO	DIO*	DPO*	LNAssets	D/E*	FAMILY*	YEAR_2019	YEAR_2020	SECTOR_3	SECTOR_4
Coefficient	0.066	0.000	0.000	0.001	0.017	-0.047	0.065	0.018	0.017	0.002	-0.057
p-value	0.765	0.716	0.008	<0.001	0.129	0.018	0.004	0.411	0.450	0.948	0.094

\* the coefficient is significant

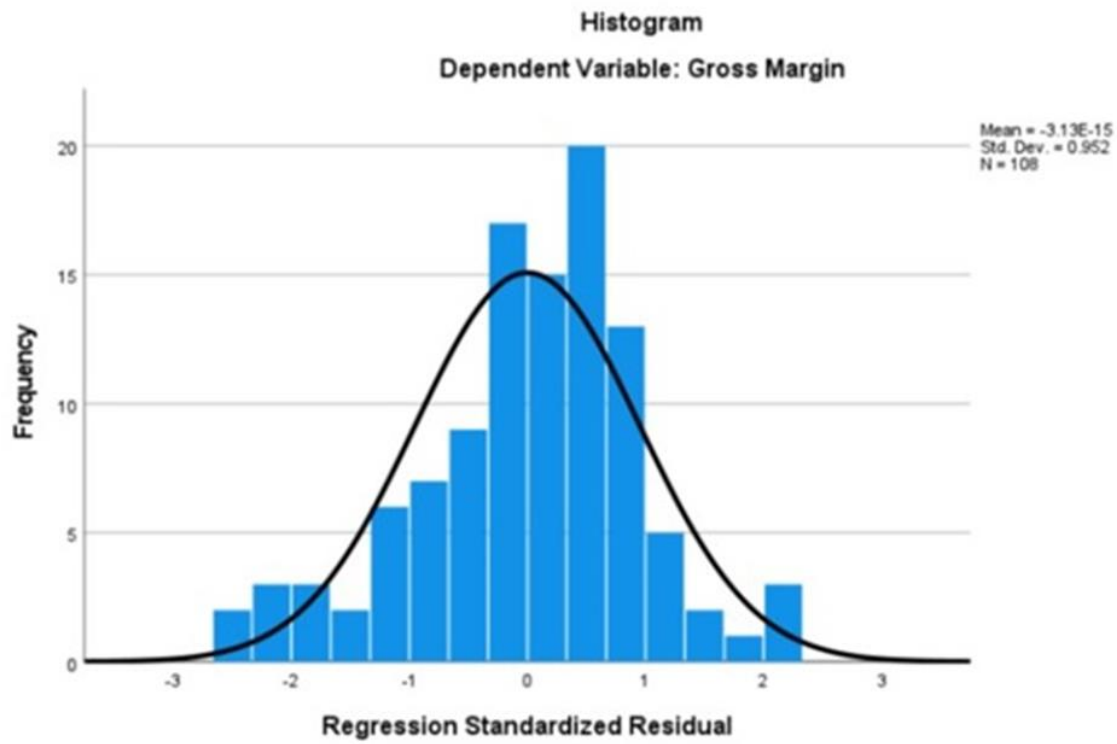
Appendix 7.9 – Graphic: Normal P-P plot of Regression Standardized Residual



Appendix 7.10 – Graphic: Scatterplot Standardized Residuals – Standardized Predicted Value



Appendix 7.11 – Graphic: Regression Standardized Residuals



## **Appendix 8 – Correlation between CCC and D/E across FBs and Non-FBs<sup>38</sup>**

Since, as already mentioned, the management of internal liquidity through CCC affects the way companies recur to additional external finance (Richards and Laughlin, 1980), it is possible to assume that the differences in CCC components between FBs and Non-FBs could be correlated to their different leverage. To verify this assumption, both groups were controlled for Spearman correlation between CCC and its components and D/E ratio.

A highly significant positive correlation is observable for FBs between DSO and D/E ( $p > 0.001$ ). Meaning that extending the time FBs wait before collecting payments is associated with a higher indebtedness. This result is expected: as a consequence of an extension in the collection period, it takes more time to FBs to convert their receivables into cash. Therefore, they lack internal resources to finance their operations and are forced to recur to debt. This conclusion also proves that FBs use their longer DPO to undertake short-term investments in operating activities. If this was not the case, FBs would have additional cash available and would not need to increase their leverage. As opposed to that, Non-FBs show a positive correlation between DPO and D/E ratio. Non-FBs who wait more before paying their suppliers are also the most indebted ones, suggesting that they might be using short-term debt to pay their suppliers.

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<sup>38</sup> See the correlation coefficients in appendix 7.2 and 7.3