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An Empirical Investigation of the Debt Maturity of Italian Family Firms

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Abstract This study examines, through a dynamic panel data methodology (GMM-SYS) applied on a sample of 1,224 Italian family firms, whether and how the debt maturity structure of Italian family firms is determined by asset maturity, taxes, agency conflicts between managers and shareholders and between shareholders and creditors, liquidity risk, asymmetric information, the recent crisis, and the past dynamics of the debt maturity structure itself. Firstly, Italian family firms do not immediately adjust their maturity structure to its target and this adjustment is costly. There is no evidence of the maturity matching principle, nor of taxes influencing the debt maturity of Italian family firms. Conflicts of interests between managers and shareholders increase as Italian family firms get older, hence older Italian family firms use more long-term debt. Moreover, the scarce presence of conflicts of interest between shareholders and creditors causes long-term debt to augment, as it is used to properly exploit growth opportunities and thus, finance long-term investments. Both low-quality and high-quality Italian family-owned businesses tend to use short-term debt, since the former are screened out of the long-term debt market and the latter employ short-term debt to signal their quality when new positive information becomes available. Finally, lower asymmetric information increases the amount of long-term debt Italian family firms can get, whereas the crisis has had a negative impact on their debt maturity and this is linked to a reduced need for long-term debt to finance the permanent assets of Italian family firms. My empirical research represents an attempt to interpret the main determinants influencing the debt maturity structure of Italian family firms, by using an advanced econometric model which can better explain the financial behaviour of the firms being surveyed. Because the work deals with Italian family firms, no comparison based on country-specific aspects has been made among family firms belonging to different countries. Moreover, the absence of detailed yearly information on the ownership, board of directors, and managers prevented me from further enhancing the knowledge of the relationship between agency conflicts and debt maturity of Italian family firms. However, these two limitations may constitute further streams of future applied research.

Keywords Debt maturity, Maturity matching, Taxation, Agency conflicts, Liquidity risk, Asymmetric information, Financial crisis

1. Introduction

It is well-known among researchers that the publication of the seminal works of [1, 2] has generated an extensive theoretical and empirical literature on capital structure - that can be defined as the mix between debt and equity -, which has studied market imperfections, i.e. mainly taxes and bankruptcy costs [3], agency costs [4-6], and asymmetric information [7, 8]. The analysis of the debt maturity structure of firms is more recent, but it has nevertheless produced an ample body of specific literature which has essentially focused on its determinants, such as those related to maturity matching [9, 10], taxation [11-13], agency conflicts between managers and shareholders [14-16], agency conflicts between shareholders and creditors [6, 17], and asymmetric information [18-21][1]. However, empirical research primarily concerns large companies in the United States [23, 24, 10, 14, 25, 26], Europe [27, 28], Latin America [29], Asia Pacific [30], and Australia [31]. Very few research studies have been conducted on small and medium-sized enterprises (for example: [32-34]) and even fewer papers have dealt with family firms (among others: [35, 36]).

Moreover, to the best of my knowledge, no empirical research has specifically been carried out on the firm-level determinants of the debt maturity structure of Italian family firms; previous studies on debt maturity have mainly examined a sample of Italian companies, mostly unquoted [37], non-public Italian firms of small and medium size [38, 39] and Italian manufacturing firms with net sales of over one million euros and at least two employees [40]. Therefore, as further detailed later in this work, I assess direction and significance of the relationships existing between the lagged

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[1] For a thorough survey of the theoretical and empirical studies on the maturity structure of corporate debt, see [22].

value over one period of the debt maturity, asset maturity, effective tax rate, firm age, growth opportunities, liquidity risk, information asymmetries, and crisis which are the independent variables, and debt maturity which represents the dependent variable. To this end, I examine a sample of 1,224 Italian family firms selected from AIDA (Italian Digital Database of Companies - the Italian provider of Bureau Van Dijk European Databases) and analysed over the period from 2004 to 2013. I employ a dynamic panel data model, through the use of the generalized method of moments system (GMM-SYS) estimator, by [41] and [42]. In particular, I make use of the two-step GMM-SYS estimator.

In the present study I shed light on the debt maturity structure of Italian family firms by verifying the major determinants of it. Moreover, I extend the basic models of econometric analysis through the application of a dynamic panel data model, which takes into account a possible long-run optimal debt maturity for the firms surveyed and the related costs of being off-target versus the costs of adjustment towards the target itself.

The main findings of my empirical research are the following. Firstly, Italian family firms face costly and non-instantaneous adjustments towards their target maturity structure. Neither the applicability of the maturity matching principle, nor the influence of taxation on the debt maturity of Italian family firms are highlighted in the study. There are indications of the presence of increased conflicts of interests between managers and shareholders as Italian family firms get older and this implies a larger use of long-term debt. Conflicts of interest between shareholders and creditors are scarce, as shareholders of family firms are mainly committed to guaranteeing the survival of the firm, preserving the family's reputation, keeping the business within the family, and reducing risk, thus enhancing firm value as a whole and not simply that of the shareholders themselves. Therefore, long-term debt can be increased to finance long-term growth opportunities. Both low-quality and high-quality Italian family-owned businesses tend to use short-term debt, since the former are screened out of the long-term debt market and the latter employ short-term debt to signal their quality when new positive information becomes available. Lower asymmetric information allows Italian family firms to obtain a greater amount of long-term debt. Finally, the crisis has had a negative effect on the debt maturity and this can be explained in terms of a lesser need for long-term debt to finance the fixed component of Italian family firms' assets.

The remainder of this article is organized as follows. In the next section I provide a review of the relevant literature and some testable hypotheses. I discuss methodology and empirical results in section three where I also make some comparisons with larger companies. Section four concludes my article.

2. Literature Review and Hypotheses

2.1. The Dependent Variable: Debt Maturity

[27] point out that several definitions of short- and long-term debt are used in international literature. For some, a debt is considered long-term if it is payable after a year (e.g., [32]), whereas for others, this is the case if it is payable after three years [23]. [10] use weighted average maturity of liabilities, while [32] use two maturity specifications: (a) long-term debt payable after one year to total debt ratio and (b) weighted-average debt maturity. Following accounting conventions and as in [27], I define long-term debt as debt maturing in more than one year and debt maturity (DMA) as long-term debt divided by total debt.

2.2. The Lagged Dependent Variable

Some authors (such as [43, 27, 44]) observe that firms may have long-run optimal debt maturity, so they need to trade off the costs of being off-target with the costs of adjustment towards the target. Therefore, [27] suggest the addition of the lagged dependent variable "debt maturity" as an explanatory variable, to test whether there is a target optimal debt maturity structure and, if it exists, the degree of divergence (convergence) from (to) the target level. They also explain that a significant, positive, and less than unit coefficient of lagged debt maturity variable would suggest that firms have a target optimal debt maturity structure they tend towards, while a greater than unit coefficient would imply that firms do not have any target ratio.

Therefore, the lagged dependent variable is included, on the right-hand side of the equation shown in paragraph 3.1, to examine the presence of possible adjustment costs towards target debt maturity structure. The characteristics of the relationship between the debt maturity lagged one year (DMA_{t-1}) and the debt maturity are left to empirical evidence.

2.3. Maturity Matching

[9] observes that firms match debt maturity to asset maturity since, on the one hand, debt maturity shorter than asset life means that firms do not have sufficient cash to reimburse or service their debts and, on the other, debt maturity longer than asset life may imply an insufficient cash flow to repay or service their debts as the assets no longer generate liquidity. [10] consider maturity matching a liquidity immunisation tool for firms, that is, a way of reducing the risk of not having enough cash flows to cover the payment associated with their debts. Several empirical investigations confirm the asset matching principle (among others: [45, 28, 46]). Therefore my first hypothesis is:

H_1: There is a positive relationship between asset maturity and debt maturity.

I employ the following measure of asset maturity (AMA), which is calculated by [47], who slightly modify a previous version of the same indicator by [48]:

$$Asset\ maturity = p_1 * \frac{Net\ Fixed\ Assets}{Annual\ Depreciation} + p_2 * \frac{Receivables}{Sales} + p_3 * \frac{Inventories}{Sales} + p_4$$

where p_1, p_2, p_3 and p_4 are, respectively, the proportion of net fixed assets, receivables, inventories and other current assets, excluding cash, to total assets.

2.4. Tax Hypothesis

[49] argue that there are two alternative explanations on the influence of taxes on debt maturity. In fact, according to [50], borrowers could lengthen the maturity of their debts when the tax advantage of debt decreases, so that the remaining tax advantage of debt is not less than the amortized floatation costs. On the contrary, [51] assert that firms may increase the proportion of their long-term debt to maximize the benefit of a higher tax shield, which would also be exploitable for a longer period. This is due to an upward yield curve or/and the intrinsic structure of corporate debt [49]. Moreover, taxes may have no effect on debt maturity structure when both corporate and personal taxes are considered, and taxes may be negligible if debt maturity and leverage are chosen concurrently [12]. Accordingly, the empirical results are mixed and not always significant. For example, [10] and [52] find a negative relationship between tax rate and debt maturity, while [49] show a positive influence of tax rate on debt maturity. Furthermore, authors such as [23, 24, 43] document no evidence of a linkage between the two variables.

For these reasons, the nature of the relationship between tax and debt maturity is an empirical issue and the effective tax rate (ETR), expressed as the ratio of tax paid to earnings before tax, is considered a valid tool to test the relationship just mentioned.

2.5. Agency Conflicts between Managers and Shareholders and Agency Conflicts between Shareholders and Creditors

Some researchers [53-55] contend that family firms are less likely to be affected by agency conflicts between managers and shareholders and related costs [4], because of the recurrent blending of the functions of property, control and management [56] and their intra-familial altruistic linkages [57]. [58] refer to [59] and state that a family organisation enables a more effective control by managers and reduces divergences of interest between managers and shareholders, while [60] specifies that the reason why the agency costs of equity are insignificant in family firms has to do with their three dominant propensities, that is: parsimony in the use of the family's personal wealth; personalism, deriving from the unification of ownership and control in the person of an owner–manager or family; and particularism, implying the use of both rational-calculative decision criteria and other "particularistic" criteria. Moreover, [61] describe a dynamic view of the agency costs of equity in family businesses. In fact, they contend that, in first-generation family firms, these agency costs are low for two main reasons. Firstly, there is a coincidence between ownership and management, as both are normally in the hands of the founder and his nuclear family. Secondly, the relationships within a nuclear family are closed, strong, and characterized by altruism, all of which enhance the firm's value across successive generations. However, as time goes by and the successors take their place in the business, agency costs of equity tend to grow. In fact, a more dispersed ownership and management increases the likelihood of conflicts of interest and information asymmetries developing between owners and managers and it creates room for the opportunistic behaviour of managers. Since short-term debt gives lenders the flexibility to effectively monitor managers with minimum effort [15], reducing debt maturity is also an effective way to minimize the agency conflicts between owners and managers [62]. Therefore, selfish managers would prefer long-term debt to avoid the potential discipline of external monitoring [14]. As a consequence, when conflicts of interests between managers and shareholders are considerable, i.e., when a family firm is older, the former will prefer longer debt maturity. Hence, an additional hypothesis is:

H_2: Firm age is positively related to debt maturity.

I utilize the number of years since the firm's incorporation to study the linkage between its age (AGE) and debt maturity.

If we look at the agency conflicts between shareholders and creditors, [4] assert that outstanding debt contracts may create incentives to over-invest, to the detriment of lenders. Instead, [6] studies the sub-optimal investment problem, whereby shareholders tend to pass up valuable investment opportunities when profits from investments will benefit only creditors, and argues that this can be avoided by issuing debt that matures before an investment opportunity can be carried out. [17] observe that the use of short-term bank debt may help resolve both the over-investment and the under-investment problems. These problems increase when firms have significant growth opportunities and, coherently with this position, [23] find that firms with more growth options in their investment opportunity sets employ a larger proportion of short-term debt. Consistent with the issue of agency problems of debt, [30] document a negative relationship between debt maturity and growth opportunities and [49] find that unconstrained firms with greater opportunities use less long-term debt. Moreover, as indicated by [63], long-term debt maturity structures significantly intensify the agency conflicts between creditors and shareholders, when the refinancing risk is high due to rollover losses [64, 65]. However, [66] argue that the divergence of interests between shareholders and creditors are less grave in family firms compared to non-family ones, because, as [67] describe, the family shareholders' objectives

of ensuring the long-term survival of the firm, preserving the family's reputation, keeping the firm in the family, along with the undiversified character of their investment, tend to encourage family firms to maximize firm value as a whole, rather than simply focusing on shareholder value. Therefore, family firms with considerable investments in intangible fixed assets, and hence significant growth opportunities, can borrow long-term debt to adequately finance them. Hence, my next hypothesis is:

H_3: Growth opportunities are positively related to debt maturity.

As a proxy for growth opportunities (GRO) the ratio of intangible fixed assets to total assets is calculated, as suggested by [68]. Given the fact that I only use book values, the widely-used market-to-book ratio cannot be employed in my empirical research.

2.6. Liquidity Risk and Asymmetric Information

Liquidity risk may be defined as the risk of not being able to repay debt, owing to the worsening in the financial or economic conditions of firms. This liquidity risk gives low-rated firms an incentive to extend the maturity of their debt to delay the probability of default, but these firms may not be able to do so, because low-quality firms may be screened out of the long-term debt market [24]. Nevertheless, there is another category of borrowers, i.e. the high-rated ones, that use short-term debt to benefit from the arrival of new favourable information, while middle-rated borrowers rely more heavily on long-term debt [19]. The presence of these two groups of enterprises, low- and high-rated ones in the first, and middle-rated ones in the second, implies that the debt maturity function is not monotonic. Therefore, the next hypothesis is:

H_4: Low- and high-rated family firms tend to have lower debt maturity compared to middle-rated firms.

I make use of the Z"-Score [69, 70], as a measure for rating family firms and thus, as an inverse proxy of their liquidity risk (LIR). As explained by [71], I employ the Z"-Score [69, 70] - which was generated for manufacturing and non-manufacturing companies, as well as for companies in developing countries - because almost all the firms I include in the sample are non public. Moreover, the Z"-Score is more suitable for the Italian context compared to the Z'-Score [72]; the firms I have taken into consideration belong to several economic sectors (both manufacturing and non-manufacturing ones), and this model applied to non-US firms is much more robust than the other Altman Z- and Z'-Score models [70]. The Z"-Score [69, 70] is identified by the following formula:

$$Z'' = 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4$$

where X_1 is working capital/total assets, X_2 is retained earnings/total assets, X_3 is EBIT/total assets and X_4 is book value equity/total liabilities.

In particular, I exploit a dummy variable which takes the value of 1 for firms with a low or high Z"-Score, i.e., for low- and high-rated family firms, and 0 otherwise, i.e. for middle-rated family firms. Specifically, the whole range of variation of the Z"-Score for the family firms being studied, that is 85.94 – (-13.26) = 99.21, is divided by 3, that is 99.21/3 = 33.07, to generate three sub-intervals of equal width, with the following values: [-13.26, 19.80); [19.80, 52.87); [52.87; 85.94]. Then, I assign a value of one (1), to each observation, if the Z"-Score is in between [-13.26, 19.80) and [52.87; 85.94] and zero (0) if the Z"-Score is in between [19.80, 52.87).

Monitoring is helpful in reducing adverse selection and avoiding some incentive problems related to the relationship between lenders and borrowers, and monitoring is facilitated by decreasing debt maturity. Therefore, when asymmetric information is lower there is less need to monitor borrowers and debt maturity can increase [39]. Empirical evidence suggests that firms with stronger information asymmetries employ more short-term debt [23] and that maturity is shorter for firms that are more opaque [73]. Hence, my further hypothesis is:

H_5: Information asymmetries are negatively related to debt maturity.

Here I draw on the ratio of tangible fixed assets to total assets to determine an inverse proxy of information asymmetries (INA), as suggested by [39], for example.

2.7. The Effects of the Financial Crisis

The financial crisis that followed the subprime mortgage market problems in the United States caused a global effect all over the world and later added to the sovereign debt crisis of the so-called "Eurozone" of the European Union.

Over this time span, approximately from the latter part of 2007 to the present, firms have experienced a substantial worsening in their ability to obtain credit from banks. [74] observe that finance literature has investigated the underlying causes of this phenomenon, producing three main interpretations. According to some, the situation essentially depends on the restriction of the supply of bank financing [75-78]; according to others, instead, it is mainly a contraction in the demand for credit by firms [79, 80]; finally, there are those who claim that this issue should be viewed as the product of a simultaneous reduction in both credit supply and credit demand [81, 82]. However, [83] stress that much of the existing research literature concentrates mainly on publicly listed large firms (among others: [84, 85, 86]). Therefore, less attention has been devoted to other kinds of firms, such as family ones.

From an Italian viewpoint, the financial crisis badly affected non-financial Italian firms in terms of credit flow. In fact, over the period that went from the second half of 2008 through the end of 2009, credit to these types of companies initially grew at progressively lower rates and later, the variation dipped into negative figures [87, 88]. In light of that, it is apt to state that the credit situation experienced by these firms, especially the small and medium-sized ones, was the

result of two combined forces, although some scholars lean more towards one or the other explanation, as previously illustrated. On the one hand, the reduction in credit concessions from banks could have severely limited access to external sources of bank debt, especially for "Eurozone" firms operating in a bank-oriented financial system. This consequence was particularly serious for non-financial enterprises, especially the smaller ones, in countries like Italy [89]. On the other hand, the drop in company investments, tied to a strong feeling of uncertainty regarding domestic and foreign demand, could have caused a fall in the number of requests for financing coming from Italian companies.[2] However, 2010 saw an improvement in the ability of Italian firms to raise capital. Nonetheless, in the following years there was first a shrinking of credit growth followed by a sharp decline, due to the sovereign debt crisis [87, 88] which erupted in late 2009 and which also affected Italy. Again, if we specifically look at this country and at the period of the sovereign debt crisis, the increased spread between Italian and German public debt bonds resulted in the credit market being effected two ways. On one side, there was a worsening in both the quality and quantity of the demand for credit, owing to the economic impact of fiscal tightening. On the other, the cost of bank financing increased because of the competition banks felt from the State in accessing capital [90] and this, in turn, made it more costly and thus difficult for firms to finance their investments.

As far as the purpose of this work is concerned, I am specifically interested in understanding the impact of the financial crisis on the debt maturity structure of Italian family firms. Previous research indicates that, during the crisis, firms had an incentive to switch to longer-term debt maturity to avoid financial distress [91], generated by shorter debt maturities in a context of negative perceptions about the evolution of their own future business, and to postpone possible problems in obtaining credit from banks, at least at an affordable rate of interest. Therefore, my last hypothesis is:

H_6: The financial crisis has caused firms to increase debt maturity.

To test it, I employ a dummy variable (CRI) which takes the value of 1 for the crisis years (2008/2013) and 0 for the non-crisis years (2004/2007).

3. Methodology and Empirical Results

3.1. Sample and Model Characteristics

My research sample is composed of family firms. There is still not a common, widespread definition of family firm in the extant literature, but attempts have been made to systematize existing family firm definitions (see [93]). The point is that what characterizes a family business is the significant impact of family on it, but the nature and extent of the family involvement are variable [94]. A few authors use multiple operational definitions of family firms (for example, [95, 96]), while a few others employ scales to take into account different kinds of family participation [97] or employ family firm typologies [98]. Furthermore, according to some, a single definition of family firm could even be ambiguous, as this would not be able to take into account fundamental distinctions existing in various legal and institutional frameworks [60, 99]. As further described below, for the purpose of this work I apply the following definition of a family firm: a firm in which at least 50% of the equity, representing a significant proportion, is held jointly by persons or families and which has at least 50 employees. The adopted definition is similar to that of [100] who define family firms as businesses with a shareholder (single or family) owning more than 50% and having between 50 and 250 employees.

I drew all the sample data from AIDA, which is the Italian provider of Bureau Van Dijk European Databases and contains comprehensive financial and ownership information concerning Italian companies. The initial sample comprised all active Italian family companies included in the database with one or more named individuals or families jointly owning at least 50% of the equity and having at least 50 employees for all the years of the survey, which amounts to 2,513 firms. I chose family businesses of this size in order to obtain more reliable financial information and make the research easier to compare, as most of the studies on family firms deal with relatively large companies [100]. This also allowed me to take into account the issue of size variability. However, to enter the final sample, useful data had to be available for all the variables, considered in the regression model presented below, for the period 2004-2013. In fact, as emphasised by [101], a dynamic model of estimation requires at least three consecutive annual observations and at least five consecutive observations for diagnostics to be robust. Therefore, at the end of the preliminary work, I excluded several companies from the initial sample either because of some unavailable data or negative effective tax rates for one or more years or some ratios having denominators equal to zero. So, the final sample includes 1,224 family firms. All the values of the variables are book values.

Similarly to [28], I adopt the following model to examine the empirical determinants of debt maturity, through a panel data methodology:

$$Y_{i,t} = a_0 + \beta_1 Y_{i,t-1} + \sum_{k=1}^{n} \Delta_k X_{k,it} + m_i + v_i + \varepsilon_{it}$$

where $Y_{i,t}$ is a measure of debt maturity, i.e. long-term debt over total debt, for firm i at year t; a_0 is the constant; $Y_{i,t-1}$ is the lagged value over one period of debt maturity; X is a group of k (k = 1, ..., 7) independent variables, as defined in

[2] Investments by Italian firms went from a figure close to 120 in 2007, to a figure just barely above 100 in 2010 (index values, with 2005 equal to 100). Between 2008 and 2009 there was a tendency towards improvement in Italian firms' capability to self-finance their investment expenditures (expressed by the ratio between self-financing and investment), but it is in direct proportion to the fall in investments themselves [92].

the previous section; β_1 and Δ_k are unknown parameters to be estimated; m_i are time-invariant unobservable firm-specific effects, such as reputation, capital intensity and attributes of managers, which vary across firms but are assumed to be fixed for a given firm through time; v_i represents firm-invariant time-specific effects, e.g. interest rates and inflation, which are common to all firms but can change over time; $\varepsilon_{i,t}$ is a disturbance term which is assumed to be serially uncorrelated with mean zero.

As summarized by [29], [102] lists three advantages of panel data methodology. Firstly, it generates larger datasets with more variability and less collinearity among explanatory variables. Secondly, it enables the investigation of issues that cannot be simply addressed by cross-section or time series datasets. Thirdly, it provides a means of reducing the missing variable problem. [29] also observes that [103] adds further benefits of panel data analysis, that is, the usually higher accuracy of micro-unit data compared to aggregate data and the possibility of taking into account the dynamics of adjustment of a specific phenomenon through time.

Although estimation of panel data models can be done by employing fixed or random effects models, in the presence of a lagged dependent variable amongst the explanatory variables these models may give biased and inconsistent estimators, since the error term may be correlated with the lagged dependent variable. To deal with this problem, instrumental variables can be exploited. The use of instrumental variables has the additional advantage of solving further problems of static models, that is, the simultaneity bias between the measure of the dependent variable and the explanatory variables, and measurement error issue [104]. [27] cite [105] who propose an instrumental variables (IV) technique whose estimators, though, might not be efficient as they do not use all the available moment conditions and do not account for the differenced structure of the error term. Furthermore, [106] highlights that [107] alternatively suggest employing the GMM specification of the first differences (GMM-DIF) - by instrumenting the dependent variable and the predetermined variables with lagged levels, and instrumenting the strictly exogenous variables with differences - as this enables researchers to deal with endogeneity and simultaneity biases. However, as noted by [27], [42] document that the extended GMM (GMM-SYS) estimator of [41] - who propose the use of both instruments in first differences for equations in levels and instruments in levels for equations in first differences - has important efficiency gains compared to GMM-DIF, for example, when the empirical study is characterized by short sample periods and persistent data. In particular, I apply the two-step GMM-SYS estimator because those estimates are deemed to be more efficient than the first-step ones [27] and I consider a few statistical tests to ascertain the consistency of the two-step GMM-SYS estimator. Firstly, I run the [107] tests on autocorrelation to find out if the error term exhibits no serial autocorrelation. Secondly, I use the [108] statistics to test the overall validity of the instruments. Finally, I conduct the Wald test for the joint significance of the estimated coefficients.

3.2. Descriptive Statistics

I discuss below the main results shown in Table 1. On average, the debt maturity (DMA) is 0.1436 and this means a small use of long-term debt, especially when compared with the mean asset maturity (AMA) (4.3870), even if the latter variable is not expressed in the same kind of measure. Among the variables which are not dummies, the firm age (AGE) and the asset maturity (AMA) are characterized by the greatest variability (their standard deviations are greater than 7), while the standard deviations of the growth opportunities (GRO) and the debt maturity (DMA) indicate the lowest variability (their values are less than 0.16). The mean value of the effective tax rate (ETR) is 0.6913. That points to the heavy weight, on average, of the surveyed firms' tax burden. Moreover, this finding can be seen as quite surprising. In Italy however, unlike the situation in other European countries, a regional tax is levied on productive activities; it is the IRAP (*Imposta regionale sulle attività produttive*), which is calculated not on earnings before tax but on the difference between operating revenues and a few costs, so the IRAP is paid on costs such as interest concerning leasing and some labour costs too. As a consequence, the IRAP is also payable in the event of a loss being reported and this justifies the high, mean effective tax rate. It is worth noting that, however, the rules concerning the IRAP have recently changed. The mean firm age (AGE) is quite high (greater than 31) and this is partly caused by the choice of a 10-year period of analysis, which obviously excludes the youngest enterprises. The mean values of the growth opportunities (GRO) (0.0209) and the information asymmetries (INA) (0.2288) lead me to point out that while Italian family firms have a low tendency to invest in intangible fixed assets, the employ of capital in assets, which are tangible, seems to represent a more important strategic choice for these enterprises.

3.3. Regression Analysis

The parameter estimates as well as some statistical tests are displayed in Table 2. The [107] test for first order autocorrelation, AR(1), rejects the hypothesis of no autocorrelation at level 0.1 of significance, while, more importantly, the [107] test for second order autocorrelation, AR(2), does not reject the hypothesis of no autocorrelation. Furthermore, the [108] test of the over-identifying restrictions confirms the validity of the instrumental variables being used. Finally, the Wald test indicates the joint significance of the estimated coefficients.

On the whole, the results confirm the hypotheses I put forward, albeit with different significance and except for two relationships. My findings are presented in Table 2 and thoroughly commented below.

Table 1. Descriptive statistics of the dependent and independent variables

Explanatory variables	*Mean*	*Median*	*Standard deviation*
DMA	0.1436	0.1021	0.1552
AMA	4.3870	2.4272	7.8332
ETR	0.6913	0.5032	2.4698
AGE	31.8129	29.0000	15.0218
GRO	0.0209	0.0050	0.0531
LIQ	0.9971	1.0000	0.0542
INA	0.2288	0.1988	0.1654
CRI	0.6000	1.0000	0.4899

This table presents descriptive statistics for the variables employed in the estimations, using 11,016 observations. The data are from AIDA (Italian Digital Database of Companies), which is the Italian provider of Bureau Van Dijk European Databases, and the sample contains 1,224 Italian family firms, for which ten consecutive years of data for the period 2004/2013 are available. DMA means debt maturity. AMA is the asset maturity. ETR is the effective tax rate. AGE is firm age. GRO stands for growth opportunities. LIQ is the liquidity risk. INA is the information asymmetries. CRI means crisis. All values are book values and are calculated as explained in paragraph 2.

Table 2. Regression results: debt maturity structure of Italian family firms

Explanatory variables	*Predicted sign*	*Coefficients*	*Standard errors*	*P-values*
DMA_{t-1}	No prediction	0.3121**	0.1557	0.0450
AMA	+	-0.0033	0.0143	0.8160
ETR	No prediction	-0.0121	0.0172	0.8122
AGE	+	0.0164***	0.0035	0.0000
GRO	+	4.0385**	1.5896	0.0111
LIQ	-	-34.8308*	1.4413	0.0589
INA	+	2.9139***	0.8269	0.0004
CRI	+	-0.1458**	0.0694	0.0356
Constant		33.6583*	18.3090	0.0660

Number of instruments: 17

AR(1) (p-value): 0.0525

AR(2) (p-value): 0.3923

Sargan's test (p-value): 0.4335

Wald test (p-value): 0.0000

This table presents the Blundell and Bond (1998) two-step GMM-SYS estimator for sample firms, using 11,016 observations. The data are from AIDA (Italian Digital Database of Companies), which is the Italian provider of Bureau Van Dijk European Databases, and the sample contains 1,224 Italian family firms, for which ten consecutive years of data for the period 2004/2013 are available. DMA_{t-1} is the debt maturity lagged one year. DMA means debt maturity. AMA is the asset maturity. ETR is the effective tax rate. AGE is firm age. GRO stands for growth opportunities. LIQ is the liquidity risk. INA is the information asymmetries. CRI means crisis. All values are book values and are calculated as explained in paragraph 2. AR(1) and AR(2) are first and second order autocorrelation of residual, respectively, which is asymptotically distributed as N (0,1) under the null of no serial correlation. Sargan's test is a test of the over-identifying restrictions, asymptotically distributed as χ^2 (df) under the null of instruments' validity. The Wald statistics tests the joint significance of estimated coefficients, asymptotically distributed as χ^2 (df) under the null of no relationship. (*), (**) and (***) indicate that coefficients are significant at 10, 5, and 1 per cent level of significance, respectively.

The positive and statistically significant coefficients (at level 0.05) of the lagged debt maturity (DMA_{t-1}) shows that the debt maturity (DMA) heavily depends on its past dynamics. Furthermore, the positive and less than unit coefficient for this variable suggests the presence of costly and non-instantaneous adjustments towards the target maturity structure [27] of Italian family firms. By way of comparison, [29], by using accounting and stock market firm-level data, documents the fact that for Latin America and the USA that type of adjustment to the target maturity is

by no means costless and instantaneous.

According to the asset matching principle, a hypothesis of positive relationship between the asset maturity (AMA) and the debt maturity (DMA) was formulated. On the contrary, my findings highlight a negative relationship between the two variables and mostly not statistically significant. One possible explanation is provided by [109] in terms of market conditions, whereby Italian family firms may encounter considerable difficulties in accessing long-term debt instruments in the Italian capital market, so that they tend to rely on the rolling over of short-term debt, as the value of the mean debt maturity, that is 0.1436, could show. In other words, short-term debt becomes basically long-term, but this obviously cannot be measured through the balance sheet values that I actually used.

The effective tax rate (ETR) and the debt maturity (DMA) are not linked by a significant relationship, therefore taxes do not influence the debt maturity of Italian family firms. This is consistent with the findings of [23, 24, 43] who documented no evidence of the role of taxes.

As hypothesized, the firm age (AGE) is positively related to the debt maturity (DMA) and this relationship is significant (at level 0.01). That supports the presence of increased conflicts of interests between managers and shareholders when Italian family firms are older, with self-interested managers preferring longer debt maturity to reduce the effect of the debt discipline imposed by lenders.

The positive and statistically significant (at level 0.05) relationship between growth opportunities (GRO) and debt maturity (DMA) generates two considerations. Firstly, conflicts of interest between shareholders and creditors are limited. This can be explained by the fact that the shareholders of family firms prefer the creation of firm value in general, rather than merely that of the shareholders themselves, because they make every effort to guarantee the continuation of the firm, make sure the family's reputation is maintained, ensure the business is kept within the family, and diminish risk. Secondly, when Italian family firms have considerable growth opportunities, and thus long-term investment prospects, the shareholders desire to adequately finance them by employing long-term debt. When it comes to listed firms, [30] instead find, for Singapore, that companies with greater growth opportunities utilize short-term bank debt to a great extent, although larger firms tend to employ long-term bank debt.

As expected, the liquidity risk (LIQ) is negatively related to the debt maturity (DMA), although only at level 0.1. That confirms the fact that low-quality Italian family firms cannot easily access the long-term debt market, while high-quality Italian family enterprises employ short-term debt to take advantage of new positive information, which enables them to show they are trustworthy. In sum, for different reasons, both types of firm rely more on short-term debt. Interestingly, [31] find that large Australian firms also signal their high quality to the market by using short-term debt in their capital structure.

The positive relationship between the tangible fixed assets to total assets (INA) and the debt maturity (DMA), significant at level 0.01, shows that the presence of lower asymmetric information increases the amount of long term-debt that Italian family-owned businesses can utilize, as there is less need for creditors to monitor borrowers. This result is consistent with that of [23] who construct a large sample of firms, by using COMPUSTAT files as well as NYSE, AMEX, and NASDAQ files, and demonstrate that companies with greater information asymmetries issue more short-term debt.

The regression results lastly indicate a negative and statistically significant at level 0.05 between the crisis (CRI) and the debt maturity (DMA). A contrary hypothesis was formulated though. This negative relationship, however, may be the consequence of a decline of investments, especially between 2008 and 2009 as documented by [92], which in turn may imply a reduction of long-term debt to finance the fixed component of the assets of Italian family firms.

4. Conclusions

In this work, the use of a two-step GMM-SYS model aims to provide an explanation of the empirical determinants of the debt maturity choice of Italian family firms.

Specifically, I assess direction and significance of the relationships existing between the lagged value over one period of the debt maturity, asset maturity, effective tax rate, firm age, growth opportunities, liquidity risk, information asymmetries, and crisis which are the independent variables, and debt maturity which represents the dependent variable.

Firstly, the results show that the debt maturity of Italian family firms heavily depends on its past dynamics, and that these firms are not able to reach their target maturity structure instantaneously and with low costs. Since the asset matching principle is neither observed nor rejected in my empirical work, one possible explanation is that the firms being studied tend to rely on the rolling over of short-term debt, that is to say that short-term debt basically becomes long-term, so that the long term-debt measure I employ cannot actually prove the presence or absence of the principle mentioned above. Taxes do not represent a determining factor in the debt maturity of Italian family firms, while the positive and significant relationship between the debt maturity and the firm age supports the presence of increased conflicts of interests between managers and shareholders when Italian family firms get older, with self-interested managers preferring longer debt maturity to reduce the burden of monitoring by lenders. My work also substantially documents the scarce presence of conflicts of interest between shareholders and creditors and this is due to the fact that the shareholders of family firms are mostly committed to ensuring the survival of the firm, preserving the family's reputation, keeping the business within the family, and reducing risk, thus enhancing firm value as a whole and not only that of the shareholders themselves. Therefore, Italian family firms largely employ long-term debt to adequately finance long-term investment prospects,

thus exploiting growth opportunities. Furthermore, there is evidence that low-quality Italian family enterprises tend to be excluded from the long-term debt market, while high-quality Italian family businesses use short-term debt to emphasize their quality when new positive information is available and, in fact, both types of firms tend to employ more short-term debt. As expected, the presence of lower asymmetric information increases the amount of long-term debt Italian family firms can use, since there is less need for creditors to monitor borrowers. Finally, contrary to my hypothesis, the crisis has had a negative impact on debt maturity and this may have been caused by a decline in investments, especially between 2008 and 2009 as shown by [92]. In fact, this decline has reduced the need for long-term debt to finance the fixed component of the assets of Italian family firms.

I believe that a major contribution of this work is that it develops the research on the debt maturity structure of Italian family firms by examining the main determinants of it. In addition, I extend the basic models of econometric analysis through the application of a dynamic panel data model, which takes into account a possible long-run optimal debt maturity structure for the firms surveyed and the related costs of being off-target versus the costs of adjustment towards the target itself.

I put forward the two main implications of my study. Firstly, as seen, conflicts of interest between shareholders and managers become significant when Italian family firms get older. These may be magnified by the presence of family members who are appointed managers through nepotism rather than merit and who are thus of lesser quality than potential hired professionals, as observed by [66]. Consequently, this should push company founders to hire, at least some, professional managers to decrease the agency costs of family management and improve firm value. Secondly, there is evidence that Italian family firms have reduced the amount of long-term debt owing to a decline in fixed investments caused by the crisis. Hence, Italian policy makers should adopt policy measures aimed at stimulating a demand these firms can serve, for instance through reduced labour costs and personal tax reductions.

One limitation of the study concerns the fact that it is focused on Italian family firms, therefore the effects of country-specific factors on the debt maturity structure of family firms belonging to different countries were not examined. Another limitation refers to the lack of availability of yearly information regarding the specific characteristics of shareholders, board directors and managers, which could have allowed me to investigate more in depth the linkage between agency problems (for example, between controlling shareholders and non-controlling shareholders, or between shareholders and managers when heirs are appointed managers or successors become CEOs) and the debt maturity of Italian family firms.

As a result, researchers could further investigate if and how country-specific factors – such as financial systems and institutional traditions, as highlighted for example by [27] for non-financial firms traded on the stock exchanges of France, Germany and the UK - determine the debt maturity choice of family firms around the world. Moreover, further research studies could try to assess the effect of ownership and management features on the debt maturity decisions of Italian family-owned businesses.

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