

The Financial Structure of Italian Companies

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The choice of capital structure by firms is a recurring topic of corporate finance and evolving on a theoretical and empirical level. On a theoretical level, scholars propose variations to the models by removing the theoretical hypothesis or expanding variables considered, likewise, on an empirical level, researchers provide survey, which contributions aimed at increasing the understanding of the phenomenon as a whole, considering the possible events in the variety and variability of firms. In particular, one of the most debated topics in the literature regards the existence or absence of relationship between the choices of financial structure and firm value, or the determination of an optimal leverage for the value. Therefore, the attention of researchers has focused on the identification of relationship between debt and equity that maximizes firm's performance and meet shareholders' expectations in terms of return on capital employed for the same risk. Hence, the aim of this paper is to provide another piece to the cognitive complexity of the phenomenon, focusing the research on Italian firms, given the importance of leverage in the financial structure of Italian firms. The methodology used is based on the analysis conducted using the Mediobanca database aggregated sector by sector to identify the main determinants of financial structure. The conclusion is that it is not possible to say with certainty which financial structure theory better represents the behavior of Italian firms concerning financial structure.

Keywords: choice of financial structure, debt financial, firm value, tax shield, tangible assets, coverage interest

Introduction

Since Modigliani and Miller argued the irrelevance of financial structure on the economic value of the firm under certain conditions, several studies have also tried to identify and justify the relationship between leverage choices and firm context.

In particular, in recent years different studies have tested this argument referring exclusively to U.S. firms.

The topic of financial structure plays a crucial role especially for the effects that they produce on the risk, the cost of capital, the cash flow dynamics and, more in general, on the firm value.

For Italian firms, the choice of financial structure has a great importance, considering the different respects to the European firms, such as the undercapitalization and the excessive incidence of short-term debt.

From the point of view of managerial characteristics, the distinctive features are to be found in the central role of family ownership and forms of management adverse to ownership. From the point of view of the financial

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characteristics, the structure of Italian firms has high levels of leverage, with strong exposure to the forms of short-term debt, a general level of undercapitalization, with high incidence of loan capital respect to equity.

The effect of managerial and financial characteristics qualifies the intensity and the structure of the relationship between firms and financial system. In particular, the excessive use of leverage and the high incidence of short term debt are at the origin of the reasons for the fragility of the financial structure that are represented respectively by the exposure to financial risk, given the rigidity of financial costs, and the instability of funding sources which is linked to their maturities. This is due to the fact that the development and the financial complexity of firms are related to their size, as evidenced by the size of Italian firms, resulting in average smaller than the main international competitors.

A second cause is to be found in the conformation of Italian financial system, as a result of banking legislation of 1930s remained in force until the 1993 Consolidated Law on Banking. However, neither the Consolidated Law on Banking nor Consolidated Law on Finance was able to bring solutions to the financial imbalance of Italian firms, moreover amplified due to of financial crashes in recent years (Forestieri, 2005).

In light of this, the present paper has two objectives, the first is to identify the behavior of the level of debt for each sector under investigation, and the second is to ascertain the methodological superiority of a theory respect the other in the field of financial structure.

Literature

The literature has offered several models of interpretation on the financial structure of firms related to the types of funding sources and to their dimensional characteristics. The school of traditionalists, which included among others, Dean (1951), Graham and Dodd (1951), Guthmann and Dougall (1955) argued that a certain level of debt has a positive impact on value theorizing, in this sense, which exists of an optimal debt ratio. According to this approach, a special relationship exists between debt and equity that minimizes the weighted average cost of capital and maximizes the total value invested in the firm. Then the propositions of Modigliani and Miller (1958) have represented the heart of the modern theory of finance, not only for its content, but also to the methodological approach, demonstrating that in the presence of perfect capital markets, the value of a firm is independent of its funding policy, whit equity or debt.

Several studies have also tried to identify and justify the relationship between choices of leverage and firms' context.

The Trade-Off Theory (Kraus & Litzenberger, 1973) can be considered as the most direct evolution of the classical theory. Subsequently, the contributions of Myers (1984), Myers and Majluf (1984) and Fazzari, Hubbard, and Petersen (1988) have laid the foundation for the study of hierarchies of firms financing.

The Pecking Order Theory (Myers, 1984; Myers & Majluf, 1984) says, in fact, that firms in making choices on capital structure would follow a precise hierarchy using financial sources on the basis of a strategy of financial self-sufficiency.

The Asymmetric Information Theory (Myers & Majluf, 1984) bases its assumptions on the existence of asymmetric information between the management and the financial market, so that asymmetric information influences the choices between internal and external financing, or between debt and equity, reinforcing the principle of the existence of a clear hierarchy between the financial sources.

Empirical Evidence

The empirical analysis was conducted using the accounting data aggregated sector by sector for the period 1998/2007, given by Mediobanca's 2009 database (Cumulative data of 2020 Italian companies), in which there are economic and financial data of 2020 firms, aggregated in 30 different sectors.

A first level of investigation was carried out by reclassifying the sectors according to the Pavitt Taxonomy (1984), which provides the classification of sectors in relation to the sources, the technological opportunities, the level of innovation, the intensity of research and development, and the type of knowledge flows.

Theories on the financial structure recognize the existence of significant differences in the financial structure of the different sectors. In particular, according to the Bankruptcy Costs Theory, the sectors that produce goods with unique characteristics should have lower leverage, as well as, according to the Agency Costs Theory, the traditional and mature industries will have a higher level of debt (Sapienza, 1997).

This empirical analysis excludes the financial intermediation sector and the insurance sector, whose fund raising is their core business, and which financial structure must still comply with the obligations established by the Financial Regulator, and it also excludes the real estate, agriculture, and hospitality sector. In fact, data aggregates are not available for these sectors.

Data analysis was carried out on the basis of financial structure indicators and specific explanatory variables of the level of debt, considered useful to the survey. In light of this, reference is made to the study of Bigelli, Mengoli, and Sandri (2001) in their paper *The determinants of financial structure of Italian firms: An empirical test on Italian companies*.

The indicators of financial structure used are:

- Debt Financing Ratio (DFR), which is the ratio between the debt (short-term loans, medium-term loans and bonds) and the set of sources of funding;
- Debt Ratio (DR), which is the ratio of all liabilities in the short and medium term and the total amount of sources;
- EBITDA Coverage Ratio (ECR), which is the ratio between EBITDA and interest costs.

The first ratio, DFR, is a measure that takes into account only the financial debt, considering the funding in the short and the long term. DR takes into account, in addition to the financial debt, even funding from third parties, including, trade payables and payables to employees. ECR expresses the level of interest coverage.

The explanatory variables are:

- Tax Ratio (TR), which is the ratio between total taxes paid by the firm and the total turnover;
- Tax Shield Ratio (TSR), which is the ratio between alternative tax shields on debt and total assets;
- Tangible Assets Ratio (TAR), which is the ratio between net fixed assets and total assets;
- Current Ratio (CR), which is the ratio between current assets and liabilities;
- Rate of Return on Common Stockholders' Equity (ROE), which is the ratio between net income and shareholders' equity;
- EBITDA Return on Assets (EROA), which is the ratio between EBITDA and total assets.

Analysis of Result

Regarding the DFR, the overall average of the sectors leads to values between 0.40 and 0.50 during the 10

years considered, as the results in Table 1. The highest ones are recording in the years 2002 and 2003, after which there is a decrease. The lowest value is in 2006 and then in 2007 (year of the beginning of the financial crisis) begins to rise.

Table 1

Average Values of DFR

Settore	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Clothing	0.5310	0.5068	0.4819	0.5155	0.4996	0.4606	0.4529	0.3955	0.3847	0.4301
Food-drink	0.4506	0.4213	0.3952	0.4035	0.3587	0.4477	0.4258	0.4411	0.4059	0.4159
Food and dairy	0.3632	0.3392	0.3794	0.3956	0.5020	0.5829	0.5796	0.5379	0.5864	0.6108
Food-canning	0.3914	0.4610	0.2571	0.3140	0.2652	0.2857	0.2702	0.3343	0.3359	0.3176
Food-confectionery	0.4031	0.4379	0.4767	0.5948	0.6287	0.6139	0.4049	0.3407	0.3551	0.3734
Food different	0.5226	0.5453	0.5910	0.5702	0.5450	0.4381	0.4485	0.4173	0.3573	0.3980
Pulp and paper	0.4208	0.4170	0.7017	0.5961	0.5826	0.5479	0.5479	0.5430	0.5129	0.5402
Chemical	0.3438	0.3451	0.4961	0.5208	0.4513	0.4518	0.4094	0.3882	0.3543	0.3394
Construction means of transport	0.4898	0.4398	0.3323	0.3335	0.3794	0.4247	0.4180	0.3481	0.3999	0.3942
Retail distribution	0.5936	0.5539	0.5285	0.4578	0.4809	0.5384	0.5116	0.5643	0.5460	0.5190
Electrical appliances, radio and TV	0.6594	0.5951	0.5589	0.5658	0.5545	0.6015	0.5374	0.5252	0.4295	0.4114
Electronic	0.4241	0.4641	0.4190	0.4438	0.4552	0.4219	0.3696	0.3666	0.3743	0.4435
Energy	0.4333	0.4008	0.3545	0.3786	0.4125	0.3984	0.3500	0.3370	0.3429	0.4957
Pharmaceutical and cosmetic	0.4233	0.4090	0.4092	0.4209	0.4199	0.4428	0.3832	0.4089	0.4467	0.4590
Chemical Fibre	0.3142	0.4167	0.3821	0.3647	0.4188	0.4837	0.4723	0.4138	0.4127	0.3850
Rubber and cables	0.3488	0.3617	0.2111	0.4338	0.4415	0.4719	0.4230	0.4297	0.5270	0.4744
Plant	0.2194	0.2763	0.2441	0.3481	0.4468	0.4836	0.4618	0.5439	0.5148	0.5047
Construction compagnie	0.6516	0.6463	0.6696	0.5965	0.5530	0.5675	0.5544	0.5506	0.5544	0.5598
Wood and furniture	0.5014	0.5006	0.5379	0.5295	0.4938	0.5153	0.5005	0.4864	0.4740	0.4365
Mechanical	0.3675	0.3696	0.3643	0.3588	0.3619	0.3637	0.3436	0.3319	0.3527	0.3620
Metals	0.5068	0.4876	0.4764	0.5034	0.5514	0.5657	0.5114	0.4566	0.4388	0.4138
Leather	0.6442	0.5779	0.5103	0.5557	0.5840	0.4692	0.4490	0.3950	0.3855	0.4365
Building products	0.3876	0.3757	0.3557	0.3663	0.3537	0.3441	0.3189	0.3235	0.3000	0.3348
Public services	0.3831	0.7519	0.6877	0.6546	0.6980	0.6817	0.6656	0.5588	0.5571	0.5495
Printing & Publishing	0.4086	0.4053	0.4388	0.4404	0.4522	0.4603	0.5231	0.3430	0.2785	0.2906
Textiles	0.4906	0.4734	0.4331	0.4596	0.4877	0.4781	0.4690	0.4529	0.4440	0.4396
Transport	0.0822	0.1011	0.1471	0.1716	0.1562	0.2079	0.2511	0.2774	0.2047	0.2162
Glass	0.4496	0.4358	0.4704	0.5290	0.5079	0.5099	0.4265	0.3554	0.3602	0.4290
Average DFR for year	0.4359	0.4470	0.4396	0.4580	0.4658	0.4735	0.4457	0.4238	0.4156	0.4279

Note. Source: Our elaboration on Mediobanca data.

DR assumes average values around 0.60, as the results in Table 2. More precisely, up to 2002 values are between 0.61 and 0.62, from 2003 to 2006 decreases settling on the 0.57 over the last three years considered. The highest value is in 1999 and the lowest in 2006.

As the results in Table 3, the average values of the ECR are between 5.75 in 1999 and 3.87 in 2007. It has no particular trend as the previous two variables, in the sense that after the peak in 1999, this ratio drops by almost one point in a few years (until 2001) and then up until 2005 and in the last two years it decreases considerably (especially in 2007).

In conclusion, in the 10 years considered DFR and DR increase up to 2003, before declining in 2004 and rise

slightly in 2007, while ECR declines after 1999, before recovering slightly in 2005 and decreases in the following two years.

In Table 4, the average values of the indicators previously analyzed for each sector are reported.

Table 2

Average Values of DR

Sector	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Clothing	0.6775	0.6596	0.6434	0.6569	0.6484	0.6127	0.6047	0.5567	0.5583	0.5883
Food-drink	0.3807	0.3784	0.3734	0.3697	0.3588	0.3788	0.3668	0.3658	0.3525	0.3613
Food and dairy	0.5067	0.4961	0.5153	0.5364	0.4501	0.4827	0.4665	0.4942	0.5145	0.5409
Food-canning	0.5991	0.6561	0.5063	0.5184	0.4964	0.5097	0.4788	0.5028	0.4980	0.4865
Food-confectionery	0.6136	0.6246	0.6427	0.7061	0.7275	0.7171	0.6030	0.5559	0.5646	0.5827
Food different	0.6648	0.6886	0.7122	0.6881	0.6690	0.6032	0.6166	0.5962	0.5444	0.5727
Pulp and paper	0.4792	0.4329	0.4957	0.4279	0.4035	0.4280	0.4279	0.4911	0.4508	0.4105
Chemical	0.4792	0.4934	0.5903	0.5861	0.5576	0.5414	0.5314	0.5111	0.5016	0.4907
Construction means of transport	0.7387	0.7144	0.6330	0.6400	0.6603	0.6983	0.7101	0.6409	0.6702	0.6889
Retail distribution	0.7764	0.7496	0.7528	0.6932	0.6946	0.7085	0.6867	0.7096	0.6920	0.6789
Electrical appliances, radio and TV	0.7867	0.7651	0.7529	0.7429	0.7424	0.7623	0.7163	0.6967	0.6648	0.6418
Electronic	0.6119	0.6650	0.6536	0.6552	0.6625	0.6375	0.6135	0.6096	0.6234	0.6634
Energy	0.5485	0.5523	0.5125	0.4990	0.5189	0.5018	0.4542	0.4480	0.4566	0.5552
Pharmaceutical and cosmetic	0.6164	0.6029	0.6054	0.5968	0.5844	0.5899	0.5408	0.5523	0.5760	0.6145
Chemical Fibre	0.5148	0.5886	0.5896	0.5650	0.5884	0.6286	0.6479	0.6123	0.6100	0.6083
Rubber and cables	0.6191	0.6258	0.5317	0.6354	0.6444	0.6768	0.6510	0.6744	0.7035	0.6743
Plant	0.8656	0.8876	0.8806	0.8957	0.8968	0.9022	0.9046	0.8709	0.8472	0.8510
Construction companies	0.8462	0.8382	0.8439	0.8238	0.8290	0.8299	0.8333	0.8178	0.8280	0.8286
Wood and furniture	0.6579	0.6544	0.6821	0.6588	0.6320	0.6599	0.6476	0.6372	0.6416	0.6036
Mechanical	0.7123	0.6735	0.6643	0.6592	0.6632	0.6652	0.6519	0.6170	0.6274	0.6275
Metals	0.6391	0.6272	0.6367	0.6293	0.6580	0.6730	0.6356	0.5906	0.5882	0.5609
Leather	0.7500	0.7141	0.6801	0.6704	0.6816	0.6064	0.6011	0.5745	0.5702	0.6008
Building products	0.5110	0.5090	0.5002	0.4979	0.4909	0.4783	0.4522	0.4443	0.4279	0.4464
Public services	0.5658	0.8054	0.7404	0.7022	0.7274	0.7279	0.7114	0.6074	0.6026	0.5999
Printing & Publishing	0.6231	0.6019	0.6096	0.6047	0.6203	0.6491	0.6721	0.5414	0.4707	0.4677
Textiles	0.6422	0.6297	0.6037	0.6095	0.6201	0.6104	0.5966	0.5928	0.5915	0.5852
Transport	0.2605	0.2688	0.2981	0.3119	0.2557	0.2925	0.3296	0.3540	0.3101	0.3307
Glass	0.6333	0.6296	0.6395	0.6658	0.6302	0.6269	0.5713	0.5341	0.5282	0.5487
Average DR for year	0.6186	0.6262	0.6175	0.6159	0.6112	0.6142	0.5973	0.5786	0.5720	0.5789

Note. Source: Our elaboration on Mediobanca data.

For 16 sectors of 28 (57%), the range of DFR average value is between 0.40 and the 0.50, five from 0.50 to 0.60, five sectors have values ranging from 0.30 to 0.40, one sector including in the ranges 0.10 to 0.20, and one sector has a range between 0.60 and 0.70.

The second ratio of financial structure, DR, is the sum of financial debts and operating debts on the total assets, thus, signaling the dependence of the financial structure from debts. The analysis shows that 13 of 28 sectors have a value between 0.60 and 0.70, eight sectors between 0.50 and 0.60, two sectors between 0.80 and 0.90, two sectors between 0.70 and 0.80, two sectors between 0.40 and 0.50, and one sector between 0.30 and 0.40. A strong tendency follows to use borrowed funds.

Table 3

Average Value for ECR

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Clothing	4.719	4.425	4.400	4.975	4.767	5.198	5.176	5.430	4.766	4.853
Food-drink	4.966	6.999	6.780	5.956	7.696	6.808	3.998	5.252	4.230	4.771
Food and dairy	5.666	7.642	5.482	5.278	3.284	3.901	4.157	4.008	3.886	2.923
Food-canning	6.467	8.275	10.941	8.546	11.026	12.363	8.114	10.216	4.902	4.926
Food-confectionery	9.222	8.694	6.274	5.262	5.700	8.446	12.832	8.506	14.183	10.849
Food different	4.188	6.137	3.967	4.391	5.252	6.193	7.840	5.297	4.720	4.112
Pulp and paper	5.682	6.243	3.363	3.614	3.913	3.562	4.023	3.375	2.385	2.025
Chemical	3.766	4.336	2.942	2.352	4.162	4.443	4.835	4.293	3.154	3.681
Construction means of transport	1.387	1.333	2.035	1.218	0.162	1.325	1.109	1.528	2.291	2.181
Retail distribution	4.282	6.511	6.070	5.788	6.391	6.262	6.525	6.789	5.607	5.151
Electrical appliances, radio and TV	3.549	5.003	3.859	3.513	3.723	4.191	4.229	3.033	3.129	2.831
Electronic	2.546	2.923	3.638	3.347	3.187	4.236	4.862	4.679	3.834	3.310
Energy	8.659	14.290	12.034	9.114	7.608	9.905	6.320	13.300	7.493	3.667
Pharmaceutical and cosmetic	6.923	10.097	9.495	9.817	9.549	8.734	9.420	7.892	7.098	5.437
Chemical Fibre	8.288	6.127	5.266	4.389	3.529	1.989	1.692	1.502	1.955	1.166
Rubber and cables	4.758	4.835	4.840	3.837	3.589	3.108	3.288	4.039	2.831	2.923
Plant	4.706	1.451	1.269	3.085	1.881	3.040	1.027	3.265	1.460	2.112
Construction companies	1.290	1.852	1.011	1.675	2.110	2.363	2.201	2.162	2.518	2.200
Wood and furniture	5.275	5.836	3.880	4.248	5.004	3.136	4.333	4.309	4.733	3.694
Mechanical	3.723	4.376	3.746	4.426	4.553	5.121	5.957	6.086	5.925	5.709
Metals	4.568	3.953	3.810	2.579	2.351	3.015	4.035	6.509	4.551	4.230
Leather	2.483	4.225	4.888	4.931	3.679	4.544	5.839	5.282	5.669	4.233
Building products	3.594	5.384	7.117	6.670	7.873	8.530	5.512	7.060	5.267	4.363
Public services	10.16	10.70	6.488	5.744	5.292	6.060	5.135	7.164	4.914	4.441
Printing & Publishing	5.577	8.039	6.643	4.746	4.576	6.158	5.002	5.310	4.845	3.446
Textiles	4.164	4.115	3.687	3.915	4.089	3.691	4.083	3.422	3.667	3.006
Transport	1.921	-0.613	0.861	0.874	1.669	0.100	1.355	1.375	-0.131	1.336
Glass	5.786	8.644	7.320	8.602	7.682	8.117	8.762	8.637	5.889	4.947
Average ECR for year	5.077	5.757	5.075	4.746	4.796	5.162	5.059	5.347	4.492	3.876

Note. Source: Our elaboration on Mediobanca data.

Table 4

Average Values of Debt Ratio by Sector

Settori	DFR	DR	ECR
Clothing	0.4659	0.6206	4.8708
Food-drink	0.4166	0.5841	5.7455
Food and dairy	0.4877	0.5003	4.6228
Food-canning	0.3232	0.5252	8.5776
Food-confectionery	0.4629	0.6338	8.9968
Food different	0.4833	0.6356	5.2097
Pulp and paper	0.5410	0.4447	3.8183
Chemical	0.4100	0.5283	3.7966
Construction means of transport	0.3960	0.6795	1.4569
Retail distribution	0.5294	0.7142	5.9375
Electrical appliances, radio and TV	0.5439	0.7272	3.7060

(Table 4 continued)

Settori	DFR	DR	ECR
Electronic	0.4182	0.6396	3.6562
Energy	0.3904	0.5047	9.2390
Pharmaceutical and cosmetic	0.4223	0.5879	8.4463
Chemical Fibre	0.4064	0.5953	3.5904
Rubber and cables	0.4123	0.6436	3.8048
Plant	0.4044	0.8802	2.3295
Construction companies	0.5904	0.8319	1.9382
Wood and furniture	0.4976	0.6475	4.4447
Mechanical	0.3576	0.6562	4.9621
Metals	0.4912	0.6238	3.9603
Leather	0.5007	0.6449	4.5775
Building products	0.3460	0.4758	6.1369
Public services	0.6188	0.6790	6.9323
Printing & Publishing	0.4041	0.5861	5.4342
Textiles	0.4628	0.6082	3.7839
Transport	0.1815	0.3012	0.8748
Glass	0.4474	0.6008	7.4383

Note. Source: Our elaboration on Mediobanca data.

ECR has a more even distribution, compared with previous results. This ratio assumes a value between 3 and 7: more precisely 8 out of 28 sectors have a value between 3 and 4, five sectors between 4 and 5, four sectors between 5 and 6, three sectors between 8 and 9, two between 6 and 7, two sectors between 1 and 2, one sector between 1 and 3, and one sectors between 0 and 1. The analysis shows good interest coverage for the sectors analyzed.

The Results of Macro-sectors

In order to facilitate the analysis of the results and correlations, the 28 sectors are classified into four macro-sectors, according to the Pavitt Taxonomy (1984) that results in Table 5.

Considering average values of the three indicators of financial structure calculated by macro-sectors, the analysis shows, as regards DFR, there is no significant differences between the traditional sectors and sectors with large economies of scale and technological sectors. In particular, the first three sectors present an average value between 0.40 and 0.50, while the sector of specialized suppliers has an average value of 0.38, as it results in Table 6.

On the contrary, as regards the DR, the Specialized Suppliers sector presents a higher value, since its range of values is between 0.70 and 0.80. The technological sector and traditional sector have a DR average value equal to 0.60 and 0.61, while the macro-sector of industries with large economies of scale has a slightly lower value equal to 0.58. These results confirm, therefore, that firms belonging to the sectors of specialized suppliers prefer more to the net operating debt respect the financial debt. This is due to the fact that this macro-sector is characterized by the presence of small firms, which have more difficulties recurring to loans, because they are unable to provide guarantees and because they cannot access to the bond market or equity market. Moreover, it seems to be confirmed by the theory of the Trade-Off, according to which firms operating in mature markets

(traditional sectors) have higher levels of debt, as opposed to firms that operate on the basis of intangible assets (technology-intensive sectors). In fact, for both debt ratios, the traditional sectors show an average value higher than the technology sectors.

Table 5

Aggregation of Industries According to Pavitt's Taxonomy

Macro-sectors	Industries
Traditional sectors	Clothing Food-drink Food and dairy Food-canning Food-confectionery Food different Retail distribution Rubber and cables Construction companies Wood and furniture Leather Building Products Printing & Publishing Public Services Transport Textiles
Industries with large economies of scale	Pulp and Paper Chemical Construction means of transport Energy Electrical appliances, radio and TV Chemical Fibre Metals Glass
Technology-intensive sectors	Electronic Pharmaceutical and cosmetic
Sectors of specialized suppliers	Plant Mechanical

Note. Source: Our elaboration on Pavitt taxonomy.

Table 6

Average of Indicators by Macro-sectors

	DFR	DR	ECR
Traditional sectors	0.449	0.602	5.118
Industries with large economies of scale	0.453	0.588	4.626
Technology-intensive sectors	0.420	0.614	6.051
Areas of specialized suppliers	0.381	0.768	3.646

Note. Source: Our elaboration on Mediobanca data.

The values of ECR are higher for Technology sector which has an average value of 6.05, followed by the Traditional sector with a value of 5.11 and sector of Large economies of scale that has a value of 4.62. The macro-sector of Suppliers Specialized shows the lowest ECR, equal to 3.64. Comparing the results of the macro-sectors, in relation to the frequency distributions of the indicators financial structure indicators, the survey

shows that the macro-sectors present a mode of DFR, a mode between 0.40 and 0.50, while Traditional sector has two values abnormal, one of the 0.10 to 0.20 (in transport) and one between 0.60 to 0.70 (public services). The High-technology sectors both have an average value between 0.40 and 0.50, while the values of Specialized suppliers vary between 0.40 and 0.60.

It appears that the Traditional sector has a higher frequency that is between 0.40 and 0.50, while the others one are positioned almost equally between 0.30 to 0.40 and from 0.50 to 0.60.

Regarding DR, the ratios are higher than the DFR, for all the main categories. Specialized suppliers have a DR very high, the Technological sector has values ranging between 0.50 and 0.70. The macro-sector of economies of scale has a symmetric distribution with six sectors between 0.50 and 0.70.

The frequency distribution of ECR for Traditional sectors is more homogeneous, with 50% of them with a value between 4 and 6 and the remaining 50% for the other values.

The Correlations With Determinants of Financial Structure

It proceeds with the calculation of the correlations of the three explanatory variables of financial structure with the determinants, so as to compare them with the financial structure theories.

These correlations are calculated using the Pearson coefficient between the average values aggregated and the average values of the macro-sectors, as it results in Table 7.

Table 7

Pearson Correlation Coefficients

	DFR	DR	ECR
TR	0.07	-0.07	0.69
TSR	0.28	-0.18	0.44
TAR	0.12	-0.41	0.47
CR	-0.37	-0.41	0.05
ROE	0.13	0.02	0.68
EROA	0.12	-0.33	0.83

Note. Source: Our elaboration on Mediobanca data.

The survey evidences a rather weak correlation of DFR and DR with TR. The correlations with TSR have been calculated, so that it is possible to estimate the importance of tax regarding the deductibility of interest costs. According to the model by De Angelo and Masulis (1980) and according to the studies of Bigelli, Mengoli, and Sandri (2001) and Buttignon and De Leo (1994), DFR and DR should be negatively correlated with TSR, on the contrary of ECR which should present a positive correlation. The results of the survey confirm the sign of the correlations for ECR and DR and show a positive correlation for DFR. Moreover, even Bradley, Jarrel, and Kim (1984) showed a significant positive relationship between the level of debt and the tax shields.

With regard to TAR, the positive correlation emerged with DFR is consistent with the Asymmetric Information Theory and with the theory of trade off. According to these theories which firms with more intangible assets are more indebted because they can provide more guarantees, while its correlation with DR and ECR confirms the theory by Grossman and Hart (1982) that considered debt as a form of financing that allowed ownership to monitor the management. The variable CR is negatively correlated with DFR and DR and positively

with ECR. This is perfectly consistent with the theory of the choice by Myers (1977, 1984) and with the results obtained by Bigelli, Mengoli, and Sandri (2001). With regard the ROE, it results a non-significant correlation with DR, while the positive correlation with DFR seems to confirm the trade off Theory.

The correlation with EROA evidences some conflicting results. DFR is positively correlated with this variable in accordance with the trade off Theory, on the contrary of DR and ECR that confirm both results by Bigelli, Mengoli, and Sandri (2001) and by the Pecking Order Theory.

Table 8

Correlation Coefficients of the Traditional Sectors

	DFR	DR	ECR
TR	0.16	0.02	0.55
TSR	0.37	0.13	0.43
TAR	0.13	-0.07	0.45
CR	-0.48	-0.48	-0.16
ROE	0.15	0.12	0.71
EROA	0.13	-0.07	0.70

Note. Source: Our elaboration on Mediobanca data.

As regard traditional sectors, there are no substantial differences with the results obtained by the aggregated average values of TAR, ROE, CR, and EROA, as it results in Table 8. With regard to fiscal variables, TR has a positive correlation with DFR but it does not show a significant correlation with the DR. Instead, the analysis of TSR leads to conflicting results to the De Angelo and Masulis model.

Table 9

Correlation Coefficients for Sectors With Large Economies of Scale

	DFR	DR	ECR
TR	-0.18	-0.27	0.97
TSR	-0.12	-0.52	0.93
TAR	-0.19	-0.70	0.81
CR	0.24	-0.10	0.06
ROE	0.25	-0.13	0.82
EROA	-0.02	-0.44	0.97

Note. Source: Our elaboration on Mediobanca data.

Different considerations apply to sectors that have large economies of scale, as it results in Table 9.

Regarding TR, the survey shows opposite results to those of Bigelli, Mengoli, and Sandri (2001) with a negative correlation to DR and DFR and a positive correlation for ECR. The correlations with TSR fully confirm to the De Angelo and Masulis model. The correlations with TAR confirm the theory of Grossman and Hart (1982) much more than the average values because in this case, both DFR and DR are negatively correlated. CR shows conflicting results. Its correlation with ROE and DFR is positive, while the one with the DR and ECR seems to confirm the hypothesis of Pecking Order Theory. Even the EROA meets the expectations of the Pecking Order Theory, although the correlation with the DFR is rather weak.

As regard the technological sector and the sector of specialized suppliers the correlation is not statically significant since these consist of only two sectors.

Conclusions

This paper has tried to identify the main determinants of financial structure starting from the aggregate data of every sector, in order to identify the sectoral behavior of the debt level. Specifically, the trend of debt during the period of analysis shows that DFR reaches a peak in 2003, it decreases during next period as a result of the tax reform, and finally it increases again in 2007 because of the financial crisis.

However, the difference between the initial value of 1998 and the terminal value of 2007 indicates a slight decrease of DFR over years. DR has a maximum in 1999, then decreases slightly, rises again in 2003 and collapses in 2005 and 2006, while increases again in 2007. ECR shows a trend more variable: after the maximum of 1999 it lowers, then grows in 2003 and collapses in 2006 and 2007.

The analysis of the average values concerning the macro-sectors indicates that the trends of DFR and DR are similar. In other words, the sectors with large economies of scale have the higher level of financial debt and the lower level of total debt. Instead, the sector of Specialized Suppliers has a higher use to operating debt, since DR is far superior and DFR is only little lower than the other macro-sectors. The traditional sectors and technological ones have between them similar values. Regarding ECR, the High-technology has the higher average value than the other macro-sectors.

The correlations with the determinants lead to conflicting conclusions. The correlations with TR are weak while the correlations with TSR confirm the De Angelo-Masulis model, however only concerning the DR and ECR. This may be due to the fact that the tax reform has mitigated the tax benefits of debt compared with equity. Also the correlations with TAR, ROE, and EROA indicate conflicting conclusions, while the correlations with CR fully confirm the Pecking Order Theory. In light of this, the paper proves that it is not possible to say with certainty which is the financial structure theory that better represents the behavior of Italian firms concerning financial structure.

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