Athens Institute for Education and Research
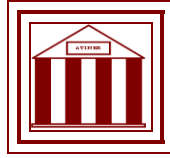# ATINER

ATINER's Conference Paper Series
BLE2015-1464

The Casual Relationship between Debt and Profitability: The Case of Italy

Marco Muscettola
Independent researcher
Italy

Francesco Naccarato
Researcher / Adjunct Professor
University of Padova
Italy

An Introduction to
ATINER's Conference Paper Series

This paper should be cited as follows:

The Casual Relationship between Debt and Profitability: The Case of Italy

Marco Muscettola
Independent researcher
Italy

Francesco Naccarato
Researcher / Adjunct Professor
University of Padova
Italy

Abstract

This paper examines the impact of debt on corporate profitability using a panel data sample of 7,370 Italian SMEs of commerce sector during 2006-2010. By utilizing the simple moving average method on profitability ratios when debts increase, the evidence supports the hypothesis that there is a non-monotonic relationship between debt and profitability. However, if the non-monotonic correlation is ignored and addressed only to one single effect, the connection between them is likely negative in some areas of Italy. Otherwise, in regions where the demand for bank credit is higher (or the offer from banks is lower), the negative correlation is muffled by an opposite phenomenon: the lower presence of financial resources makes more selective the evaluation of creditworthiness and consequently, firms highly levered are those that have also higher profitability, and then the best rating.

Keywords: Credit market, Corporate profitability, Correlation matrix, Indebtedness,

Introduction

According to the agency costs theory, there are two contradictory effects of debt on profitability and the choices of capital structure will ineluctably depend on the exogenous variables to the firms: the bank credit market. On the other hand, it is observable that the credit market in Italy is strongly affected by external factors. Especially in this period of economic downturn (Muscettola, 2014 C), Italian firms do not renounce to bank loans although they have an adequate self-financing[1].

In simple words, till today there is properly not one theory that gathers all the aspects of indebtedness, because the manifold nature of this matter inevitably leads to a partial and systemic argumentation. Only recently, indeed, some business theories peer, which, along with the analysis of risks due the indebtedness, also consider the effects as a "creation of value": a "contingent claim analysis". The bank debt, hence, is capable to either create or destroy wealth.

Then, alongside the economic theory, come new theories on business economics, which assess that the indebtedness choice, to a firm, besides a significant decision, enhances its chance to support previous investments as it produces, whether the profitability of loans is higher than the costs of financing, some perspectives of profitability meaning development and wealth, this way. On the other hand, negative effects inevitably occur on the firm vulnerability yet, due to a major financial exposure and, anyhow, about the aforementioned theory on indebtedness choices, the main factors that bias its leverage are, in their turn, influenced by elements exogenous to the firm per se.

If average leverage is either a consequence of the bank credit market, more notes must be added about the banks methods of resources allocation, that usually do not hit the mark targeted as investing. In fact, the most of banks do not carry out more than a static type analysis, featuring the counterparty rating combined with a transactional phase[2].

With methods of statistical scoring - even though only incidentally taking care of entrepreneur's plans as well as business strategic plans and consistent qualitative variables -, banks award firms a static judgement regarding their insolvency chances. This does not mean that the rating models used by banks do not work fine, but only that the instrument of statistical analysis is too often used in a rigid and critical way (Muscettola, 2015 B).

---

[1]This thesis is supported by several papers that have examined the credit market in Italy as Di Giulio (2009), Albertazzi et al. (2010), De Socio (2010), Accetturo et al. (2011), Bonaccorsi e Sette (2012) e Muscettola (2015c).

[2]The use of "rating" instrument in banking strictly depends on two orders of primary causes (Muscettola & Gallo, 2008). The first is about the bank organizational structure for preliminary credit, with accurate internal rules and related-risk acceptance grids as set by the risk management office. The second cause is the bank interest in the accounting calculation of expected, and unexpected, loss of credit to disburse, so that the bank may exactly insert it into its own credits portfolio, with a due weight in terms of risk, according to domestic and international laws. This way the models can be backward-looking, based on historical and elapsed data, rather than pretty synonymous of a business future potentiality.

In the study, we assumed that the rate of corporate profitability must depend on the dynamics of the capital structure and, vice versa, that firms - that are able to finance themselves with profits - require external capital at a lesser degree. The hypothesis can be explained as follows: "if the firm growths in profitability financial indebtedness should be reduced". After calculation, these aspects need to be transposed into specific territorial frames, where they meet other variables, which have more or less influence over the corporate leverage of Italian firms.

The present essay consists of five parts, besides this introduction. Paragraph Two sees a quick illustration of the major academic studies, which focused on the relationship between corporate profitability and indebtedness. Paragraph Three portrays the peculiarities of the sample we used, as well as the input data, and a definition of variables related to the study. Paragraph Four depicts the descriptive analysis of our sample, in relation with the chosen indicators, also featuring the correlation matrix as well as the graphic evidence of moving averages. Paragraph Five provides a subdivision in ten territorial zones of our sample, in addition to the previous analysis. Paragraph Six contains the conclusions.

Library Review

In recent years, the corporate indebtedness and profitability have been analysed by several researchers academically. However, some studies show a positive relationship between leverage and profitability, others show a negative relationship between leverage and profitability, others, finally, show an absence of a specific relationship between the two dimensions (Muscettola, 2014 A). Furthermore, the disagreement among the three doctrines occurs not only empirically but also theoretically.

Regardless of the results obtained, in all the studies the portrait that emerges is that intentional preference of corporate managers on either debt finance or equity finance becomes the keyword for the profit maximization of a firm. It is apparent that it induces important alterations in the firm's debt and equity finance, and this intersects with six theories which highlight the influence of debt on corporate profitability, namely: signaling theory, asymmetric information, market timing theory, tax theory, bankruptcy cost and the agency costs theory. Before these theories, however, the company choices derived from those that are the known theories of capital structure: Pecking order theory[1] and Static trade-off theory[2]. The signaling theory, asymmetric information and market timing theory are included in the pecking order frame

---

[1] The theory is based on the eradication of the hypothesis of perfect information, and the business management, since recognizes the true value of its assets, matures that is cheaper to finance its investments by self-financing, first, and then via debt. Firms will only appeal to the risk capital as extrema ratio.

[2] The theory affirms that firms are steered, to seek their own optimal capital structure per each single type of business, based on quantification of costs, and benefits of debt. Firms choose their financial configuration, offsetting the benefits of debt to the costs of instability.

work, while tax theory, bankruptcy cost and agency cost are incorporated in the static trade-off theory.

Most of the empirical evidences conducted shown a negative relationship between profitability and debt. These papers, consistent with the pecking order theory, contain Kester (1986): he found a notably negative relationship between profitability and debt ratios in American and Japanese manufacturing firms; Titman and Wessels (1988), demonstrated that firms with high profit levels would preserve moderately lower debt intensities; Rajan and Zingales (1995), also found a significantly inverse relationship between profitability and leverage in their sample of firms; Fama and French (1998), revealed that debt handling does not necessarily confer tax benefits, and highly indebted firms may actually cause agency problems instead, among shareholders and managers or creditors, that envisage a negative connection between debt and profitability; Cassar and Holmes (2003), studied the impact on capital structure of SME's Australian evidence and, like Hall et al. (2004), found an inverse relationship between profitability and debt ratios; Graham (2004), showed a negative connection between total debt and profitability, especially for firms that are big and profitable; Abor (2005), found an inversion relationship between profitability of listed firms in Ghana and long-term indebtedness; Amidu (2007), studied the factors of capital structure of banks in Ghana and he established an opposite correlation between short-term debt and firm productivity.

On the other hand, some researchers found a positive association between leverage and firm profitability. Papers sustaining the existence of a positive connection between profitability and firm leverage are the studies of Leibestein (1966), Nerlove (1968), Baker (1973), Taub (1975) through a regression analysis; Peterson and Rajan (1994), Roden and Lewellen (1995) in a study about leverage buyout of firms; Champion (1999) and Abor (2008) limited to short-term debt.

The empirical literature pertaining to the impact of debt on profitability leads us to make two inferences. The first one is that most of the practical studies focused on listed companies or big firms. The second one is related to scarceness of researches on the Italian firms. These two avenues stimulated our study. This paper contributes to the existing empirical literature about the relationship between debt and profitability of the Italian SMEs with a large sample of commercial firms differentiated by territorial headquarters.

Data Description And Variables

Our main objective is to determine whether corporate leverage diminished profitability during recent years and if it is also possible to establish a link between the two variables (debt and profitability) and the type of verse. There are several techniques to measure debt and profitability. According to the prevalent literature, for our study framework, and to compare our results to

other similar analysis, we adopted six measures of profitability[1] and three measures of debt[2] most used. In the choice of ratios we found that, after being treated, each of the variables used to answer positively to the principles of monotonicity test and sensitivity or specificity check (*Roc curve*).

There are three measures of indebtedness: financial debts on total assets (FDA), debt ratio (DR) and total debt on equity (DOE). On the other side, there are six profitability measures: return on equity (ROE), return on sales (ROS), operating profit on total debt (OPD), EBITDA on investment (EOI), return on investment (ROI), and return on assets (ROA).

The source for empirical data is the yearly statements provided by Crif Spa[3]. The sampling frame consists of the 7,320 active private companies operating exclusively in commercial sectors. The firms analysed are small and medium-sized enterprises (SMEs) with revenues from 5 million to 50 million euro, operating in Italy. The reference year for the analysis is 2009. All the firms which have been insolvent at least until the year 2010 are excluded. In the research, a firm has been considered as default-grade if Central Credit Register reports the existence of credit overdue for more than three months[4]. The choice in the selection of commercial firms springs up from the fondness to gain a sample homogeneous enough in size and type of company. That segment of the sample and a non-excessive series of variables linkable to data allow us to extend to other firms some findings of research, to normalize some trends and, lastly, to better manage the outliers of the examined sample.

In addition, we eliminated firm-years for which the value of capital stock is less than four million euro, those exhibiting real asset, total assets, debt, firm's earning or sales fast growing or in sharp decline. We eliminate also firms with negative net worth and earning, operating profit and Ebitda negative[5]. Then, outliers were removed in order to avoid extreme data that can damage the averages and distributions. We deleted the observations which are situated outside the interval defined by the 2nd and the 98th percentile. In this way we have created a set of homogeneous analysis avoiding problems of heteroskedasticity (Muscettola, 2014 B).

---

[1]According to Saleem and Rehman (2011), net income or profit after tax to equity is return on equity (ROE) ratio, whereas, operating profit to total assets and operating profit to capital employed are ROA and ROI ratios respectively (Muscettola, 2014D). According to Muscettola and Pietrovito (2012) operating profit to sales is return on sales (ROS). And according to Muscettola and Naccarato (2013) operating profit to sales and Ebitda to total debt are EOI and OPD respectively.

[2]According to Hovakimian et al. (2001), as regards to total debts to total assets is called debt to assets or simply debt ratio (DR). Whereas, long term debts to an equity is called debt to equity (DOE) ratio. According to Muscettola (2013) as regard to financial debts ratio (FDA).

[3]CRIF is the leading provider in Italy of banking credit information. CRIF is an independent company of credit bureau services, business information systems, and credit and risk management solutions to support banks and financial institutions.

[4]This classification is narrower than the one usually applied in bank rating models, as these consider default to be the onset of severe financial suffering which borrowers cannot resolve if unaided, and through which the credit and loans settled may be lost.

[5]In this way the distribution of the selected indexes answer positively to the principles of monotonicity.

The final sample, for which complete financial information was available for the entire five year, 2006 through 2010 period, is a data collection made on an annual basis even if the base year for the analysis was 2009[1].

The study has two parts. The first part relates to trend analysis with variables corresponding to the indebtedness and the profitability ratios. The second one tests the correlation results for all variables with the distinction of geographical dimensions calculated through the supply of bank credit

Table 1 reports summary statistics. It shows the distribution of the average values, median, standard deviation and first and third quartile for each ratio that formed the list of explanatory variables of the study.

Table 1. *Summary Statistics of Accounting Ratios Used in the Research - for Year 2009*

	Accounting Ratio	Quartile 1	Median	Mean	Quartile 3	Standard Deviation
FD	**Financial Debt / Total**	3.57	18.81	21.5	34.91	18.77
DR	**Debt Ratio %**	57.57	73.98	69.3	84.70	19.68
DO	**Debt to Equity %**	1.36	2.84	4.75	5.54	6.50
RO	**Return on Equity %**	4.22	10.72	15.2	20.69	15.66
RO	**Return on Sales %**	1.84	3.27	4.55	5.85	4.24
OP	**Operating profit / Total**	4.75	7.93	13.3	16.13	13.79
EOI	**Ebitda on Investment %**	6.03	9.05	11.8	14.46	9.08
ROI	**Return on Investment %**	4.03	6.49	9.25	11.44	8.41
RO	**Return on Assets %**	3.66	5.71	7.58	9.70	5.88

Source: Author's calculations

Descriptive Analysis

An analysis of the correlation helps to discover the trend and level of interrelatedness between two variables. The correlation matrix for the variables is reported in Table 2. The results show that debt is negatively correlated with profitability, but this negative effect, in some cases, is unclearly. Looking at the relationship between the indicators themselves, the results show that the multicollinearity is not a problem for the application of analytical techniques.

Table 2. *Pearson Correlation Matrix*

	FDA	DR	DOE
ROE	-0.17575	0.08980	0.07793
ROS	-0.11054	-0.44341	-0.26119
OPD	-0.36295	-0.68416	-0.34169
EOI	-0.31104	-0.44959	-0.29015
ROI	-0.29098	-0.41960	-0.26526
ROA	-0.24154	-0.39567	-0.28058

Source: Author's calculations

---

[1]We preferred year 2009 because it was the period with the most available data and with a lower standard deviation between the variables.

As a result of the analysis of the correlation matrix, all the values are inversely related, except two values assigned to the ROE index. As negligible, these values show an undefined relationship between indebtedness and ROE. The cause may hide inside the real nature of this variable, made of both an economic element (net earnings) and an asset ratio as denominator. In case of inadequate corporate capitalization, thus, the relation "debt to equity", for example, will of course be high as good as the relation "revenue to equity" considering the aforementioned low company net-worth. This indicator produces values that give different, ambiguous and contradictory interpretations, which avoid the relevance of ROE as univocal signaller of the business profitability (Muscettola, 2015 A).

Nevertheless, even the economic indicator resulting from the relation between operating profit and total debt, featuring total liabilities as denominator, is fully influenced; there is a self-evident link to the strong negative correlation with the DR variable, also featuring total liabilities as denominator.

Indices FDA and DOE look like less mutually interrelated regarding financial variables and ROS index, among profitability variables, featuring both numerator and denominator pulled out of the income statement.

Anyhow, it is evident a gradient of a quite negative correlation, even though this link appears less relevant.

In order to analyse the relationship between corporate debt and profitability, we use a simple trend-smoothing technique. Sorting in ascending order the "debt to equity" index, "DOE", from the less to the most indebted firm, we analyse the related "return on sales" index, "ROS", for each company using the "simple moving average" (SMA) technique. We use two of the most representative indices for corporate debt and profitability, to detect, graphically too, the trend of the averages. Both indices have been preferred for their similar trends, averages, and variances, as data illustrated in Table 1. Moreover, they have a slight dispersion of the average.

In statistics, a moving average is a computation to analyze data points by creating a series of means of different subsets of the full distribution used. It is a simple method to smooth the data.

Given the increasing distribution of DOE ratio and a fixed subset size of 40 observations, the first element of the moving average is obtained by taking the average of the initial 40 observations of the ROS series. The next averages are taken from an equal number of data (40 observations). A moving average is a set of numbers, each of which is the average of the corresponding subset.

Graph 1 shows that, as the DOE index value increases (described on right scale), the ROS moving averages gradually decrease.

Figure 1. *Simple Moving Average for ROS when Debt Increases*
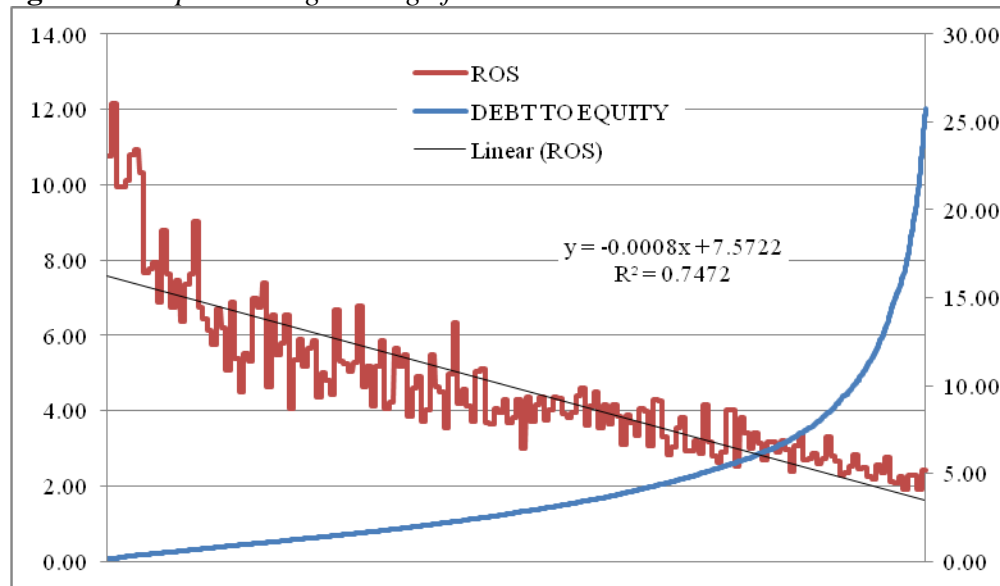
Source: Author's depiction

The downward trend finds a further confirmation via the linear regression equation. The relationship between the X (DOE) and Y (ROS) variables is portrayed as points on the coordinate plane (X, Y) and form an empirical linear regression Y of X. The strong connection between the two indicators is also revealed by R-squared, that expresses a value higher than the results of previous studies, and by the correlations depicted in Table 2.

Supply of Bank Credit in Italy

Starting from some of the most iconic works, within reference literature, and from recent studies of Calza et al. (2003), Casolaro et al. (2006), Soresen et al. (2009), and Panetta and Signoretti (2010), it is possible to loom a map of Italy to distinguish the single provinces on the base of the bank credit offer. In order to define the weight of the credit offer, we use an indicator, among the indices most relevant in literature, made of the ratio between the total credit granted to firms in every province, and the GDP (Gross Domestic Product) related to the same area.

This indicator divides the 101 Italian provinces in ten classes having the same size, sorting them from the class 1, which represents the provinces with the lower bank credit offer, until the class 10 containing those areas with a higher bank credit compared to the company production.

Table 3. *Provincial Classes Sorting by Bank Credit on Provincial GDP*

Classes	Bank credit / GDP	
	From	**To**
1	0.29964	0.473505
2	0.482741	0.562942
3	0.564802	0.661278
4	0.672306	0.735099
5	0.736771	0.883147
6	0.884844	1.060782
7	1.065172	1.201761
8	1.206378	1.335283
9	1.387119	1.77538
10	1.779553	2.54314

Source: Author's calculations

This is the way we seek the possible links between the bank credit market and the business capital structure, presuming that, in certain zones with a low credit offer, banks prefer to grant only firms featuring a major profitability, even though those companies ought to present the minimum need for financial support.

Afterwards, we check up, with the results for the global sample, the output of the ten sub-samples built on the base of the bank credit offer. Then we proceed with the correlations among the three debt indices and the six corporate profitability ones, analysing the sample by the ten aforementioned sub-samples.

Table 4. *Correlation Matrix between Financial Debts on Assets (FDA) and Profitability Ratios Divided for Provincial Classes*

	ROE	**ROS**	**OPD**	**EOI**	**ROI**	**ROA**
1	-0.22	0.03	-0.21	-0.24	-0.22	-0.17
2	-0.27	0.10	-0.25	-0.28	-0.26	-0.17
3	-0.11	0.04	-0.33	-0.25	-0.21	-0.16
4	-0.28	-0.05	-0.39	-0.37	-0.37	-0.33
5	-0.11	-0.11	-0.34	-0.32	-0.26	-0.19
6	-0.15	-0.03	-0.32	-0.23	-0.24	-0.20
7	-0.16	0.01	-0.27	-0.28	-0.24	-0.14
8	-0.24	-0.19	-0.41	-0.34	-0.33	-0.30
9	-0.15	-0.23	-0.44	-0.36	-0.33	-0.30
10	-0.10	-0.11	-0.40	-0.30	-0.31	-0.27

Source: Author's calculations

Table 5. *Correlation Matrix between Debt on Equity (DOE) and Profitability Ratios Divided for Provincial Classes*

	ROE	ROS	OPD	EOI	ROI	ROA
1	0.07	-0.07	-0.18	-0.18	-0.12	-0.11
2	0.18	-0.24	-0.34	-0.17	-0.17	-0.27
3	0.13	-0.31	-0.34	-0.29	-0.28	-0.28
4	0.05	-0.24	-0.32	-0.28	-0.26	-0.29
5	0.03	-0.25	-0.30	-0.29	-0.24	-0.24
6	-0.02	-0.24	-0.30	-0.25	-0.21	-0.22
7	0.18	-0.21	-0.36	-0.25	-0.24	-0.24
8	0.08	-0.26	-0.33	-0.31	-0.27	-0.28
9	0.06	-0.32	-0.42	-0.34	-0.34	-0.35
10	0.04	-0.29	-0.33	-0.31	-0.28	-0.29

Source: Author's calculations

Table 6. *Correlation Matrix between Debt Ratio (DR) and Profitability Ratios Divided for Provincial Classes*

	ROE	ROS	OPD	EOI	ROI	ROA
1	0.23	-0.16	-0.42	-0.26	-0.15	-0.15
2	0.12	-0.32	-0.66	-0.28	-0.28	-0.36
3	0.12	-0.47	-0.75	-0.47	-0.47	-0.43
4	0.04	-0.48	-0.68	-0.46	-0.45	-0.50
5	0.07	-0.40	-0.66	-0.53	-0.42	-0.36
6	0.09	-0.42	-0.53	-0.26	-0.21	-0.22
7	0.17	-0.40	-0.68	-0.43	-0.43	-0.37
8	0.03	-0.43	-0.64	-0.44	-0.41	-0.37
9	0.11	-0.52	-0.74	-0.50	-0.50	-0.45
10	0.15	-0.41	-0.68	-0.47	-0.41	-0.35

Source: Author's calculations

By tables, it is easy to see that in the first classes, where a minor bank credit offer is supposed to be available to firms, the yoke of indebtedness over profitability gets less evident to the companies. Even omitting the ROE index, that stands negligible, the correlation appears quite scarce, even turning positive as in the first three classes of credit offer inside the matrix of correlation between FDA and ROS.

After this examination, we repeat the graphic analysis of the moving averages between DOE and ROS, as we already did with the global sample, but studying sub-sample by sub-sample within the ten territorial classes.

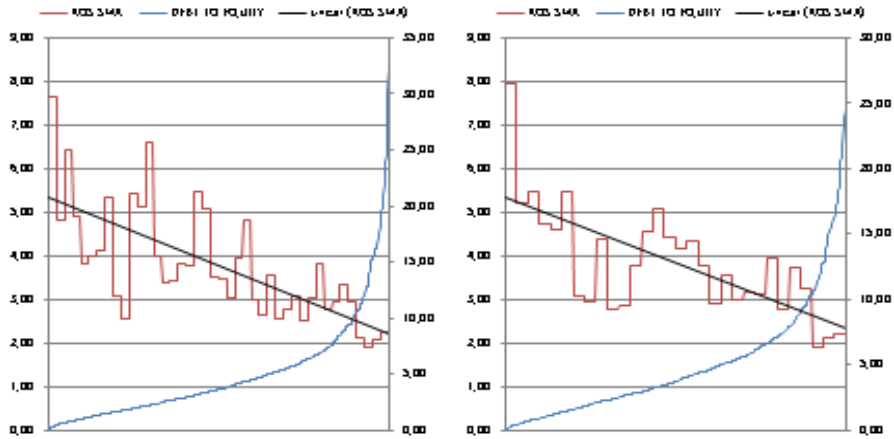**Figure 2.** *Simple Moving Average for ROS when Debt Increases in Areas 1 and 2*

Figure 3. *Simple Moving Average for ROS when Debt increases in Areas 3 and 4*
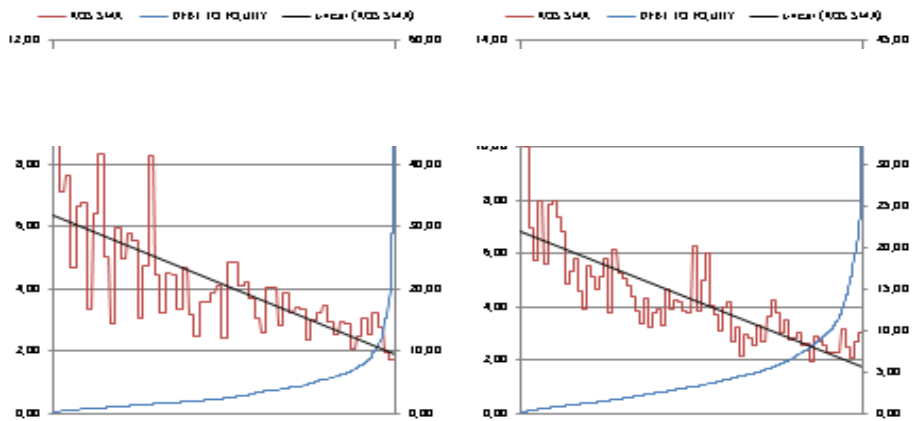
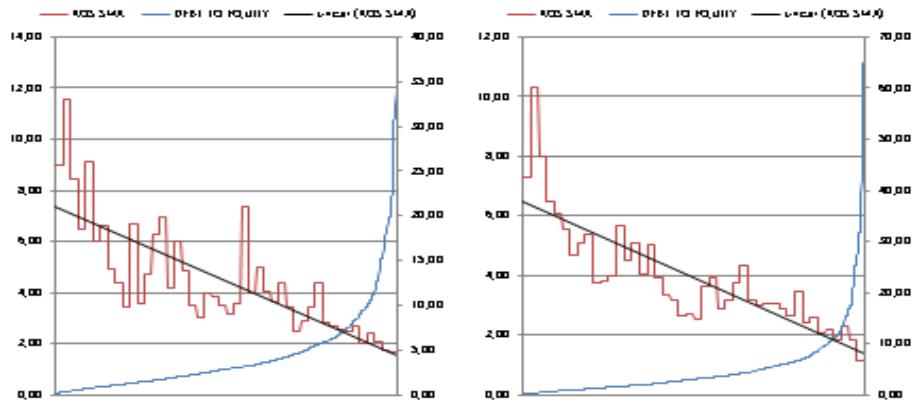**Figure 4.** *Simple Moving Average for ROS when Debt Increases in Areas 5 and 6*

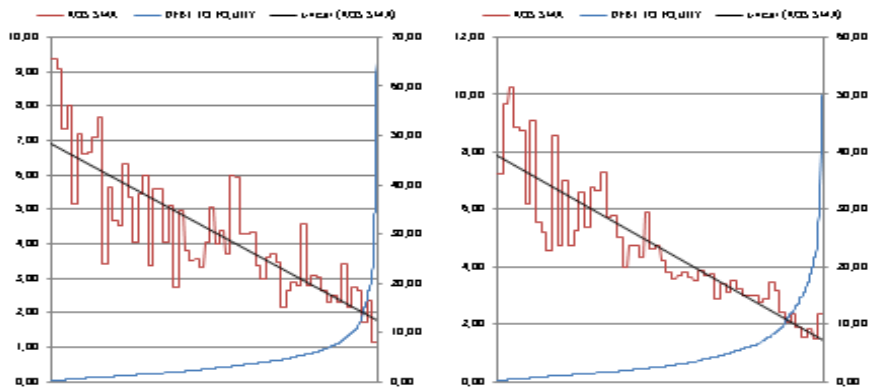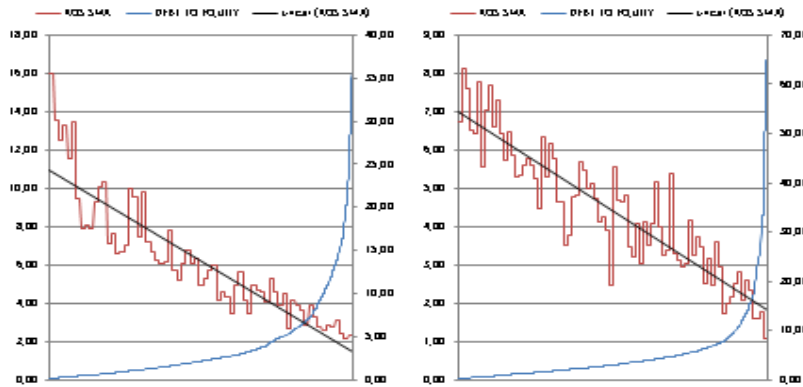**Figure 5.** *Simple Moving average for ROS when Debt Increases in areas 7 and 8*

Figure 6. *Simple Moving Average for ROS When Debt increases in Areas 9 and 10*

The following Table 7 is even most relevant; because it compares the R squared[1] of the ten samples resulted by the moving averages of ROS, as DOE index increases. In order to avoid too long arrays, which might have distorted the linearity of the moving averages, we truncated the distributions of first and last decile. Thus, we obtained, in response, curves less inclined.

Table 7. *Statistics of Regression*

Independent variable (X)	Dependent variable (Y)	R-squared
DOE – AREA 1	ROS – AREA 1	0.230993
DOE – AREA 2	ROS – AREA 2	0.157906
DOE – AREA 3	ROS – AREA 3	0.341674
DOE – AREA 4	ROS – AREA 4	0.527269
DOE – AREA 5	ROS – AREA 5	0.394044
DOE – AREA 6	ROS – AREA 6	0.545315
DOE – AREA 7	ROS – AREA 7	0.468977
DOE – AREA 8	ROS – AREA 8	0.552682
DOE – AREA 9	ROS – AREA 9	0.591711
DOE – AREA 10	ROS – AREA 10	0.612411

Source: Author's calculations

---

[1]R squared is a number that indicates how well data fit a statistical model. It is a statistic used in the context of statistical models whose main purpose is the testing of hypotheses, on the basis of other related information. It provides a measure of how well observed outcomes are replicated by the model, as the proportion of total variation of outcomes explained by the model.

The most newsworthy outcome, indeed, is the trend led by the medium company, which stays out of the strongly indebted firms, or absolutely not indebted. Therefore, the following table shows the ten R-squared referred to the ten trends, parted per specific territory.

From this table, it is easy to observe that in territorial areas with a minor bank credit offer, the linear prediction model, between debt rising and corporate profitability (expressed in SMA), is less expressive. In other words, the same proportionality, or the same linear trend between ROS and DOE, is not effective unlike those areas with a higher credit offer where, in spite of a major credit offer, firms with a higher profitability logically opt for a lower grade of indebtedness.

The starting point, *"If the firm growths in profitability financial indebtedness should be reduced"*, therefore, is demonstrable in territories with a larger bank credit offer; elsewhere, on the other hand, it is not so clear the relationship of inverse proportionality.

Conclusions

This finding is consistent with that of Baum et al. (2007) on American industrial companies. In addition to it, when we present the analysis using geographical areas where the supply of bank credit is lesser, we also find out this: there is not merely the same impact regard the profitability of firms. To a future prospect, it would be remarkable to take into a certain account some considerations. First, it will be interesting to cover this investigation also with manufacturing firm and, transversely, to deepen the specific components of corporate debt (financial debts, borrowings, long-term debts, bonds …). Secondly, we preferably would increase new detailed elements for firms like macroeconomic factors, bargaining power of managers, terms and pricing of debts, ownership assembly of equity and location in which firms work.

The paper focuses on the relationship between the financial structure and the business profitability and the conclusion reached is that the theory of order of choice works only in certain areas, where the credit offer is higher. The relationship between the two variables, in those territories, is inverse: the firms, which are more profitable, are less indebted too. Where there is a lesser intensity of credit, due to reasons ascribable to demand and supply of funding, the correlation among variables is lower. In those areas, banks are more selective and then a major consideration goes to firms featuring higher ratings and a likely larger profitability. So, firms established in these zones better access to bank financing, even though they do not need any help, as bank credit looks like a secondary resource. This very fact means a further credit restriction to those firms with lower rankings, and so the whole territorial economic system eventually suffers any evident consequence to it.

Reference

Abor, J. 2005. The effect of capital structure on profitability: An empirical analysis of listed firms in Ghana. *The Journal of Risk Finance*, 6 (5).

Abor, J. 2008. Determinants of the capital structure of Ghanaian Firms. *African Economic Research consortium*, Research paper No. 176, Nairobi.

Accetturo, A., Giunta, Rossi, S., 2011, Le imprese italiane tra crisi e nuova globalizzazione, Questioni di economia e finanza n. 86, gennaio.

Albertazzi, U., Marchetti, D., 2010. Credit supply, flight to quality and evergreening. Temi di discussione n. 756, April.

Amidu, M. 2007.Determinants of capital structure of banks in Ghana: an empirical approach. *Baltic Journal of Management,*2 (1), 67-79.

Bakar, S.H. 1973. Risk, leverage & profitability: an industry analysis. *Review of Economics & Statistics,* 55, 503-7.

Baum, C. F., Schafer D. and Talavera O. 2007: «The Effects of Short-Term Liabilities on Profitability: The Case of Germany», *Money Macro and Finance (MMF) Research Group Conference 2006 61*, Money Macro and Finance Research Group.

Bonaccorsi, E., Sette, E. 2012. Bank Balance Sheets and the Transmission of Financial Shocks: Evidence from the 2007-2008 Crisis. Temi di discussione n. 848, January.

Calza, A., Gartner, C., Sousa, J. 2003. Modelling the Demand for Loans to the Private Sector in the Euro Area. Applied Economics, Vol. 35(1), pp. 107-117.

Cassar, G., Holmes, S. 2003. Capital structure & financing of SME's. Australian evidence. *Journal of Accounting & Finance*, 43(2),1223-47.

Casolaro, L., Eramo, G., Gambacorta, L. 2006. Un modello econometrico per il credito bancario alle imprese in Italia. Moneta e Credito, giugno.

Champion, D. 1999. Finance: The joy of leverage. *Harvard Business Review*, 77(4),19-22.

De Socio, A. 2010. La situazione economico-finanziaria delle imprese italiane nel confronto internazionale. Questioni di economia e finanza n. 66, aprile.

Di Giulio, D. 2009. Finanziamenti bancari al settore produttivo: Credit crunch o extra-credito?. Temi di Economia e Finanza, n. 1, ABI, Centro Studi e Ricerche, novembre.

Fama, E.F., French, K.R. 1998. Taxes, financing decisions, & firm value. *Journal of Finance*,53,819-43.

Graham, J.R. 2004. How big are the tax benefits of debt. *Journal of Finance*, 55, 1901-41.

Hall, G.C., Hutchinson, P.J., Michaels, N. 2004. Determinants of the capital structures of European SME's. *Journal of Business Finance & Accounting*, 31 (5), 711-28.

Kester, W.C. 1986. Capital & ownership structure: a comparison of United States & Japanese manufacturing companies. *Asian Economic Journal*, 20 (3),275-302.

Leibenstien, H. 1966. Allocative Efficiency vs. X-Efficiency. *American Economic Review*, 56,392-415.

Muscettola, M., Gallo, M. 2008. Analisi e gestione del rischio di credito. Il progetto Mayflower. FrancoAngeli Editore.

Muscettola, M., Pietrovito, F. 2012. Le caratteristiche delle imprese insolventi. Il Rating tra impresa, banca e territorio. *Rapporti di ricerca, 36. Sinergie Editore.*

Muscettola, M., Naccarato, F. 2013. Probability of Default and Probability of Excellence, an Inverse Model of Rating. One More Tool to Overcome the Crisis:

an Empirical Analysis. *Business System Review*, Vol. 2, No. 2. DOI= http://dx.doi.org/10.7350/BSR.BV06.2013.

Muscettola, M. 2013. Leverage Risk. The weight of borrower capital distinguishes the solvency of firms: an empirical analysis on a sample of 4,500 Italian SMEs. *International Journal of Economics and Finance*; Vol. 5, No. 12. DOI= http://dx.doi.org/10.5539/ijef.v5n12p24.

Muscettola, M. 2014-A. 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*, Vol. 9, No.5. DOI= http://dx.doi.org/10.5539/ijbm.v9n5p25.

Muscettola, M. 2014-B. Structure of assets and capital structure. What are the relations with each other? An empirical analysis of a sample of Italy. *European Journal of Business and Social Sciences*; Vol. 2, No. 11; 55-69.

Muscettola, M. 2014-C. Effects of Fixed Capital Investments in current economic downturn. *International Journal of Management & Information Technology*. Vol.9, No. 3.

Muscettola, M. 2014-D. Probability of efficiency: Statistical implications that lead firms to achieve a minimal and sufficient ROI. Empirical evidence on a sample of 5,388 Italian SMEs. *Journal of Management and Strategy*; Vol. 5, No. 5. DOI= http://dx.doi.org/10.5430/jms.v5n4p26.

Muscettola, M. 2015-A. Predictive ability of accounting ratios for bankruptcy. *Journal of Applied Finance & Banking*; Vol. 5, No. 1.

Muscettola, M. 2015-B. Difficulties for small firms to invest in research prerogatives. An empirical analysis of a sample of Italian firms. *Applied Economics*; Vol. 47, No. 15. DOI= http://dx.doi: 10.1080/00036846.2014.995363.

Muscettola, M. 2015-C. L'intensità della domanda e dell'offerta di credito bancario come fattore rilevante di classificazione delle imprese. *Rivista Bancaria - Bancaria Minerva*. 2015-2.

Nerlove, M. 1968. Factors affecting difference among rates of return on individuals common status. *Review of Economics & Statistics*, 50, 312-31.

Panetta, F., Signoretti, F. 2010. Domanda e offerta di credito in Italia durante la crisi finanziaria. Questioni di economia e finanza n. 63, aprile.

Petersen, M., Rajan, R. 1994. The benefits of lending relationships: evidence from small business data. *Journal of Finance,* 47,3-37.

Rajan, R.G. Zingales, L. 1995. What do we know about capital structure? Some evidence from international data. *Journal of Finance*, 50,21-60.

Roden, D.M., Lewellen, W.G. 1995. Corporate capital structure decisions: evidence from leveraged buyouts, *Financial Management*, 24,76-87.

Saleem, Q. Rehman, R.U. 2011. Impacts of Liquidity Ratios on Profitability. Interdisciplinary Journal of Research in Business, Vol.1, No.7, July, pp.95-98

Sørensen, K., Marqués Ibáñez, C.D., Rossi, C. 2009. Modelling loans to non-financial corporations in the euro area. Working Paper Series 989, European Central Bank.

Taub, A.J. 1975. Determinants of the firms capital structure. *Review of Economics & Statistics,*57,137-51.

Titman, S., Wessels, R. 1988. The determinants of capital structure choice. *Journal of Finance*, 43,1,1-19.