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October 2016

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ABSTRACT

This paper aims to provide an empirical analysis concerning the different aspects of profitability of the Italian manufacturing firms of intermediate size, namely medium and medium-large size companies, for the period 2004-2010. It analyzes various aspects of firm profitability relating corporate structures, that is, capital structure, risk component, asset composition, and growth opportunities. The study investigates firm profitability by using econometric panel-data techniques, such as the system dynamic GMM estimator that assures the robustness of our empirical analysis. One of the main results of our investigation is that we find a significant and negative impact of capital structure (i.e. leverage and tangibility) and risk component on firm profitability.

JEL classification: C23, G32, L25, L60,

Keywords: Mid-sized Italian firms, profitability, panel data, GMM.

I. INTRODUCTION

The paper aims to provide an empirical analysis of profitability of the Italian manufacturing firms of intermediate size for the period 2004-2010, and uses the System GMM estimator for the estimation of dynamic panel data models. The present study contributes to extend the empirical literature on profitability of mid-sized Italian manufacturing firms, by focusing on the firm-specific determinants on profitability, as well as the relationship between corporate structure and firm performance.

Thus, this contribution is an empirical investigation that focuses on profitability of Italian manufacturing firms of intermediate size, which are essentially medium and medium-large size joint stock companies. They are characterized by family ownership, high degree of internationalization, continuous product innovation, specialization in high quality products, and strong ties with the Italian industrial districts; also, these firms usually operate under conditions of monopolistic competition (Colli, 2005; Coltorti, 2006; Coltorti *et al*., 2013; Schilirò, 2011, 2012).

In addition, this paper investigates the behavior of Italian manufacturing firms of intermediate size and their peculiar corporate structure, by focusing on risk component, asset composition, capital structure, growth opportunities, and the relationship of these factors with the firms' performance.

The empirical results of this study provide evidence that firms appear to operate in condition of monopolistic competition, since profits tend to persist over time, which may be a consequence of product differentiation and specialization in high quality products, as the empirical literature on the mid-sized Italian manufacturing firms seems to suggest (Colli, 2005; Coltorti, 2006, 2014; Coltorti *et al.*, 2013). Also, profitability, for this category of firms, is inversely related to the leverage ratio, and the relationship between firm asset tangibility and profitability is negative. Finally, profitability is inversely related to the risk variable.

The paper is structured as follows. Section 2 discusses the topic of profitability of firms in light of the theoretical literature; section 3 introduces the framework of our analysis by describing the mid-sized Italian manufacturing firms and their peculiar features; section 4 analyzes the data and the estimation method; section 5 shows the empirical model; section 6 discusses the empirical results; section 7 provides the conclusions and proposes the objectives for future research.

II. LITERATURE ON PROFITABILITY OF FIRMS

The economic literature on profitability of firms is vast and involves many fields like strategic management, accounting and finance, and industrial economics. Since firm profitability is affected by numerous factors, for the purpose of our empirical analysis, we find convenient to look at different theoretical strands. Thus, to consider firm specific effects on profitability, we look at strategic

management literature, and in particular to the resource-based view. This theoretical strand claims that the bundle of resources, organizational structure, and management practices of the firm establish a link between the internal characteristics of the company and its performance (Teece, 1981; Barney, 1991; Peteraf, 1993, Levinthal, 1995). Consequently, according to the resource view model, the heterogeneity in profitability across firms, is the result of the persistent differences in their specific characteristics (Rumelt, 1991; Hawawini *et al.*, 2003). Empirical literature shows that in this type of models above-average profits are the result of tangible (financial and physical factors of production) and intangible (e.g. technology, reputation) resources that reflect the distinctive capabilities of the firm, which are rare or costly to be copied or imitated. Empirical findings broadly confirm the dominance of firm-specific factors in determining the firm's profitability with respect to industry-specific and country-specific aspects (Rumelt, 1991; McGahan, Porter, 1997; Claver, Molina, Tarí, 2002; Hawawini *et al*., 2003; Brito, Vasconcelos, 2006, Kachlami, Yazdanfar, 2016).

Another strand of literature we look at is corporate finance. It is well known that corporate finance literature has traditionally focused on the study of financial decisions, mostly long-term decisions, therefore corporate structure and dividends, fall among the topics it studies. We are particularly interested, in the empirical literature regarding the effect of capital structure on firm's performance (Berger, Bonaccorsi di Patti, 2006; Zeiturn, Tian, 2007), but also the analysis of corporate sustainability performance (Artiach *et al.* 2010). The latter authors support the view that leading firms have higher levels of growth and a higher return on equity than conventional firms, but do not have lower leverage than other firms. Furthermore, we consider the literature on firm growth and the relationship between growth and profits (Goddard *et al*., 2005; Coad, 2007). In particular, Goddard *et al.* (2005) have examined the financial drivers that could impact on firm's profitability in European manufacturing and services. These authors looked at the relationship between size and profitability, and adopted the return on asset (ROA) as a measure of profitability. They found that a firm's profitability is negatively related with size and gearing ratio and positively related with market share and liquidity. Finally, we take into consideration the literature on the persistence of profit approach (McGahan, Porter 1999; Goddard *et al.* 2005) which may reflect the influence of both industry-level and firm-level factors[1].

[1] Goddard, Tavakoli and Wilson (2009), analyzing the sources of variation in profitability and growth for manufacturing firms located in eleven European countries, have found that the firm-level effects are the most important class of effect in explaining the variation in performance.

III. CHARACTERISTICS OF MID-SIZED ITALIAN MANUFACTURING FIRMS

Mid-sized Italian manufacturing firms are the object of our investigation on profitability. These firms, which are joint stock companies, have some special characteristics. They are generally distinguished for being family-owned, organized in groups, for having links with industrial districts, a tendency to innovate the product continuously, a strong international presence, and a commercial model specialized in niches of high quality products in order to defend against manufacturers in low-cost countries and large-size multinationals (Colli, 2005, Coltorti, 2006, Coltorti *et. al*., 2013, Schilirò, 2011, 2012). As Colli argued (2005) – and the literature on mid-sized Italian companies tends to confirm[2] –,the intermediate size of companies is not to be intended as a size of transition between the small and large, is meant to persist over time and represents a well-structured economic corporate system.

This type of companies, originated in the 1970s, derives from the gradual transformation of Italian industry following the globalization of market competition and the declining performances of the largest Italian industrial groups.[3] In addition, intermediate size firms have been consolidating as a result of changes in product demand due to radical changes in consumer behavior and consumption pattern. Most of these firms are involved in the production of "Made in Italy" goods and express Italy's long-standing supremacy in food production, clothing, home furnishing, and light mechanic (Schilirò, 2010, Coltorti, 2014).

Italian manufacturing firms of intermediate size are both medium-sized firms employing between 50 and 499 workers, and medium-large companies employing more than 499 workers.[4]

The following features are most commonly found in their business model. These companies make a limited use of capital and manage to succeed in international markets by focusing on the quality of their workmanship, on the maximization of the value produced per employee (and this translates into innovations), on a corporate finance characterized by few debts, and on the ability to manage the corporate organization. At the same time, these firms focus on competitive advantages, with the intangibles (brand, communication, customer relationships, etc.) as the factors that have increasingly acquired importance.[5] Since they are able to create market niches, these firms usually operate under monopolistic competition. The literature seems to indicate that the Italian manufacturing firms of intermediate size enjoy a good and time-persistent profitability compared to both larger and smaller companies (see Colli, 2005; Coltorti, 2006, 2012, 2014; Schilirò, 2011). The aim of this paper is to

[2] Coltorti (2006, 2008, 2014), Coltorti *et al.*(2013), Marini (2008), Schilirò (2010, 2011, 2012).

[3] For the transformation and disintegration of large industrial firms due to the globalization, see Feenstra (1998).

[4] See Mediobanca-Unioncamere (2005-2011).

[5] Coltorti and Garofoli (2011); Schilirò (2012).

investigate the profitability of the Italian manufacturing firms of intermediate size using panel data econometrics in order to detect the determinants of profitability, to evaluate their impact, to highlight the presence of persistent profits, and to investigate the firm specific factors.

IV. DATA AND ESTIMATION METHOD

Our study investigates the profitability of Italian manufacturing firms of intermediate size (medium and medium-large firms) using panel data analysis. To identify this category of firms we followed the criteria previously adopted in Italy by Mediobanca. These criteria are based on two parameters: turnover and number of employees.[6] More specifically, the dataset considered takes into account only firms with a turnover ranging from €50 million to €3 billion and with a number of employees starting from 49. In our analysis, we refer to data published over the years in the *Annual Survey of the Leading Italian Companies* carried out by the Research Unit of Mediobanca.[7] We focus on the manufacturing firms excluding from the sample both public and service sectors companies. Thus, the sample includes 1066 Italian manufacturing firms of intermediate size for the period 2004-2010, all joint stock companies, although most of them are not publicly traded.[8] Also, since the panel used in the analysis is unbalanced, the total annual observations considered are 4267.[9]

As confirmed by empirical literature, the choice of using panel data models is justified since this approach often tends to outperform time series or cross-section analysis. In fact, longitudinal data increase the number of observations by pooling several time periods of data for each firm. This determines a more accurate inference of model parameters and a larger set of available estimators. At the same time it allows the opportunity of deepening the dynamics of firm behavior.[10]

Hereunder, Table 1 shows the variables of the model that we adopt, their expected effect, and summary statistics.

[TABLE 1 about here]

[6] The conventional criteria limiting the sample have been set forth by the Research Unit of Mediobanca that provided the dataset.

[7] Mediobanca, *Le principali società italiane*, (2005 - 2011). These surveys document financial statements of the leading individual Italian companies.

[8] The period under consideration allows to cover different phases of the business cycle; a first phase (2004-2007) and a second phase (2008-2010).

[9] The panel is unbalanced since it contains firms entering or leaving the market during the sample period (e.g. due to default, mergers). Unbalanced panels are very common in studies of a specific country's firm profitability (for a discussion on unbalanced panels, see Baltagi, 2013).

[10] Cameron and Trivedi (2011) show that panel data analysis achieve consistent estimations by controlling for unobserved individual heterogeneity and the associated biases.

In our model, there are three alternatives to measure a firm's profitability and efficiency: ROA, ROE, and PROFIT. [11] More specifically, ROA reflects average return on total gross assets and it is calculated on the basis of earnings with respect to company assets consisting of both debt and equity. It represents the ability to generate turnover by exploiting the available resources. Therefore, ROA indicates the return offered to all the firm's financial stakeholders. ROE is the return available to shareholders after considering tax and others claimants. Finally, PROFIT is calculated as the EBIT divided by total assets. The first two ratios are the most commonly used indicators of profitability in empirical studies on firm profitability. However, ROE is a sensitive indicator of debt expansion and buy-back of shares: these two actions will affect the measure of profitability. In order to examine the robustness of our empirical findings, we prefer to adopt three alternative ratios as financial performance variables.

From Table 1, we can derive few interesting clues. Firstly, the average return to equity for the sample is about 10.2%, while the average return to asset as whole is 6.16%. Consequently, ROA is smaller than ROE, which means that financing costs less than the profit it makes. In other words, the firm is making sufficient profit on borrowings to cover the cost of the interest on those funds. Mid-sized Italian manufacturing firms often overcome this important financial stress test. Furthermore, for these financial ratios, there are not universal value benchmarks, but they should be assessed with regards to the sector and time period taken into account. Lastly, PROFIT − the variable that represents the net profits on total assets − appears the least volatile profitability indicator, but is also the one with the lowest average yearly return (2.27%).

V. THE EMPIRICAL MODEL

This section describes the empirical model for the estimation of the firm-level profitability. More specifically, in order to assess the many aspects of firm profitability, we conduct an empirical analysis by using an econometric model that relates the firm's performance to a set of explanatory variables which includes firm size, risk, and capital structure. More specifically, inspired partly by previous empirical literature (e.g., Hawawini *et al*., 2003; Goddard, Tavakoli and Wilson, 2005; Berger, Bonaccorsi di Patti, 2006; Coad, 2007; Zeiturn, Tian, 2007; Artiach *et al.* 2010), we specify a panel equation aiming at capturing the potentially relevant factors in determining firm profitability. The specification of the static model is the following:

$$PR_{i,t} = \beta_0 + \beta_1 GR_{i,t} + \beta_2 Risk_i + \beta_3 Tang_{i,t} + \sum_{j=2}^{4} V_j Sized_j + \beta_4 Leverage_{i,t} + u_{i,t}, \quad (1)$$

[11] Both ROA and ROE reveal how well a company uses its financing and assets to create income.

The dependent variable *PR* stands for profitability of the firm *i*. As it has been pointed out in the previous section, we use three alternative proxies for this variable of interest. The three alternatives are ROA, ROE, and PROFIT, all continuous variables.

The determinants of firm profitability, instead, are represented by *GR, RISK, TANG, SIZE*, and *LEVERAGE*.

GR is the rate of growth of sales and measures the growth opportunities of the firm. Several empirical studies (e.g. Cowling, 2004; Coad, 2007) have shown a positive and significant relationship between firm growth and profitability. However, this result is not conclusive. In fact, Davidsson *et al*. (2009), who follow the resource view reasoning, cast doubt on that positive effect and tend to confirm that profitable low growth firms are more likely to reach the desirable state of high growth and high profitability as well as to have a decreased risk of ending up performing poorly on performance dimensions. Hence, we cannot establish an *a priori* effect for the variable *GR.*

RISK is a control variable that measures the standard deviation of ROE over the six-year period for each firm. Since when we adopt the *ROE* ratio as dependent variable the risk component is a function of the return on equity, *RISK* is assumed to be a predetermined variable in the System GMM set-up. We introduce this *RISK* variable in accordance to corporate finance literature. Although riskier firms (i.e. firms with higher performance volatility) are expected to generate greater expected return, several empirical studies (Berger, Bonaccorsi di Patti, 2006; Zeitun, Tian, 2007; Lee, Li, 2012) have founded a negative effect of risk on profitability. These authors justified their finding as the result of higher operating risk that implies a higher probability of financial distress along with higher bankrupt costs, and thereby lowers firm's performance.

TANG captures the composition of the asset structure and is calculated as the ratio of physical capital divided by the total assets. The relationship of this explicative variable with firm performance may be positive, but the effect could revert to negative if the fixed asset is relatively high. This latter finding may be ascribed to the decreasing marginal efficiency of the capital. Prior studies (Zeiturn, Tian 2007; Artiach *et al*., 2010) have found an overall negative correlation between the tangibility asset and firm profitability. Since firms often invest part of their profits to boost fixed asset, one should also bear in mind a possible reverse causation from higher profitability to more tangibility. For this reason, we model firm tangibility as an endogenous variable in the System GMM set-up.

SIZED represents a set of dummy variables included in the model to control for differences associated with firm's size. As in Berger and Bonaccorsi di Patti (2006), we include size class dummy variables; in our case, the dummies are ranging from below €100 millions in gross total assets (*Sized 1*) to over €5 billion in gross total assets (*Sized 4*). The control group is the category of the smallest firms (*Sized 1*, under €100 millions in gross total assets), while the other estimated dummies (*Sized 2*, *Sized 3*,

Sized 4) have to be compared to the benchmark category (*Sized 1*). Firm's size influences the profitability since it can be a proxy of the firm's efficiency and therefore the omitted (benchmark) variable may represent the most efficient firm.

Even if some previous studies (e.g., Lee, Li, 2012) have found a non-monotonic effect of the firm's dimension on profit rate or, alternatively, a negative correlation, other studies (Hall, Weiss, 1967; Gleason, Mathur, Mathur, 2000; Claver *et al.,* 2002; Tian, Zeiturn 2007; Artiach *et al.*, 2010) in contrast, showed a positive and significant coefficient on firms' profits.[12] Hence, the expected effect of the relationship between firms' size and profits is uncertain.

LEVERAGE is a determinant that captures the influence of corporate capital structure on the firm's performance and is measured as the ratio of financial debt to the gross total assets. Generally, corporate governance models predict that leverage influences agency costs and, consequently, affects positively firm's profitability (Harris, Raviv, 1991; Myers, 2001). However, a relatively high leverage indicates an anomalous firm's structure and that the financial expenses became too high. Moreover, a further expansion of financial debt may produce significant agency costs of external debt that determine risk shifting, or a reduced effort to control risk that may, in turn, result in higher expected costs of financial distress, default, or liquidation.[13] These agency costs translate into higher interest payments for firms to reward debt holders for their expected losses. Furthermore, if we relax the Modigliani-Miller (1958) capital structure irrelevance principle, this will imply the presence of an external risk premium, i.e. leverage would be more expensive than equity. Finally, several empirical analyses (e.g. Tian, Zeitun, 2007; Jang, Park, 2011) have found negative and significant effects of leverage on corporate performance. Thus, we expect both leverage and corporate return to be negatively related. As for tangibility (*TANG*), also *LEVERAGE* is treated as potential endogenous variable in the System GMM estimator, as lower profits induce higher financial debt and *vice versa*.

The model also contains the constant term β_0 and the disturbance component $u_{i,t}$, the latter term consists of two components, the unobserved firm-specific effect v_i, and the idiosyncratic error $\varepsilon_{i,t}$.

According to the persistence of profits literature (McGahan, Porter, 1999; Goddard *et al*., 2005; Mcmillan, Wohar, 2011), firm's profits show a tendency to persist over time, because of markets imperfections, asymmetric information, and market power. Consequently, we also adopt a dynamic

[12] Our dataset does not contain the very small firms, in fact the sample starts with firms more than €50 million in total assets and /or more than 49 workers. It also does not contain the large companies.

[13] The agency costs of debt are usually explained in terms of asset substitution or of risk-shifting issue. The latent conflict among debt claimants and equity is such that shareholders expropriate wealth from bondholders by investing in new projects that are riskier than those currently held in the company's portfolio. In this case, shareholders acquire most of the gains (i.e., when high-risk projects payoff), while bondholders bear most of the cost (Fama, Miller, 1972; Jensen, Meckling, 1976;).

equation that includes the dependent variable with two lags[14] among the explicative variables. Thus, the dynamic specification of our model is:

$$PR_{i,t} = \beta_0 + \lambda_0 PR_{i,t-1} + \lambda_1 PR_{i,t-2} + \beta_1 GR_{i,t} + \beta_2 Risk_i + \beta_3 Tang_{i,t} + \sum_{j=2}^{4} V_j Sized_j + \beta_4 Leverage_{i,t} + u_{i,t}, \quad (2)$$

Where the coefficients λ_i represent the speed of adjustment to steady state equilibrium. In other words, if λ_i are close to 1, profits are highly persistent, denoting evidence in favor of scarcely competitive goods markets. Conversely, values of λ_i close to 0 imply a highly competitive environment.
Finally, both equations (1) and (2) do not include temporal dummies to control for time effects. The inclusion is not plausible because, across all the specifications, their coefficients are jointly statistically insignificant accordingly to the F-Test.

V.1 Univariate Analysis of The Model

In this section we examine the Pearson correlation coefficients and carry out a univariate analysis of the model adopted.

[TABLE 2 about here]

Table 2 reports the cross-correlation coefficient among the variables. In this regard, several observations can be made. First, firm's leverage appears to be the most important factor associated with the firm's low performance, in so supporting the hypothesis that capital structure (agency costs) and financial debts influence negatively the profitability, as widely shown in the empirical literature. Second, corporate performance is also negatively and significantly related to tangibility, so it is consistent with another assumption regarding the decreasing marginal efficiency of physical capital. Third, a weaker support was found about the effect of firm's dimension on profitability; in fact, the correlation between size and performance is nearly always statistically insignificant and, in addition, the coefficients (*Sized 2, Sized 3, Sized 4*) are close to zero. This result is also confirmed when the number of employees has been adopted as alternative firm's dimension proxy. However, as it has been argued in section 5, the dimensional heterogeneity of the sample is not so relevant here. Fourth, preliminary results of the other control variables, namely risk and rate of growth of sales, show opposite effects. The first variable (risk) displays a negative and significant correlation with

[14] In the specific case of ROE equation, the dependent variable PR is included as explanatory variable only with one lag; while the GR variable (i.e. rate of growth of sales) is included with two lags.

profitability, while the second (the growth opportunity variable), positively impacts on corporate returns, as expected.

From the point of view of robustness, even if some of the control variables are mutually correlated, showing few evidences of collinearity, the magnitude of the coefficients is small.[15]

V.2 Econometric Specifications

In our empirical analysis, we address the following issues regarding the identification of the model. First, we estimate the static specification (namely, equation (1) section 5) by using traditional econometric methods such as Ordinary Least Square, Random or Fixed effect model, and the Generalized Least Square. Therefore, at this stage, by applying the Chow test, we examine the presence of unobserved heterogeneity that makes pooled regression results heavy biased. In our case, the Chow test always rejects the null hypothesis. Second, we try to assess, through the Hausman test, if the individual effects are fixed or random. The results of the Hausman test suggest adopting the fixed effects for the ROA and PROFIT, while for the ROE the proper specification is the Random effects specification.

However, within our study, the models described above might produce biased and inconsistent results, particularly for the dynamic specification in equation (2) section 5, because of the potential issue of endogeneity, i.e. because the disturbance term of the specification is correlated with the explanatory variables, and consequently, will produce biased coefficients and standard errors. To overcome this issue, Arellano and Bond (1991), Arellano and Bover (1995) and Blundell and Bond (1998) developed the Generalized Method of Moments (GMM henceforth) for panel data analysis, this estimator deals with the abovementioned biasedness and inconsistency of the standard model applied to the static specification. In particular, Blundell and Bond (1998) deal with the issues caused by endogeneity by recurring to lagged and differenced values of the explanatory variables as internal instruments.[16] Moreover, system GMM estimation in dynamic panel models is robust to control for reverse causality, simultaneity bias, and possible omitted variables; while it controls the individual and time specific effects. Hence, we address these econometric issues by using a two-step system GMM technique (Arellano and Bover, 1995; Blundell and Bond, 1998) estimating a level-equation

[15] As Gujarati and Porter (2009) suggest, multicollinearity becomes a serious issue only when the correlation among the control variables exceeds the threshold of 0.8. Moreover, the Variance Inflation Factors (VIF) test showed no evidence for multicollinearity among the model variables (mean VIF values ranged between 1.07 and 1.66).

[16] In the system GMM estimator, the endogenous explanatory variables are instrumented with their lags so that the instruments are uncorrelated to the disturbance.

as well as a difference equation[17]. Furthermore, the use of a dynamic equation − such as (2) in section 5 − is justified because we expect that firm's profits denote a tendency to persist over time.

In order to evaluate the validity of our System GMM estimations, we ran two common tests that confirm the null hypotheses. The first test is the Arellano–Bond, which confirms the absence of second-order autocorrelation in the transformed idiosyncratic errors. The second one is the Sargan test, which strongly confirms the soundness of the imposed over-identifying moment conditions and consequently the validity of the instruments used.

In addition, our econometric model takes into account Roodman's advice (2009) concerning the excessive "proliferation" in the number of instruments that may cause over-fitting of the endogenous variables and could bias the specification tests of instruments' joint validity. Therefore, we have evaluated the robustness of our GMM results by forcefully cutting the numbers of instruments by reducing lag length.[18]

Moreover, all GMM regressions adopt the Windmeijer (2005) correction procedure for the estimation of standard errors.[19]

Finally, to achieve the models dynamic completeness required for the System GMM estimator, we include two lagged dependent variables for PROFIT and ROA, whereas for ROE the lagged variable is one. We also checked the robustness of the estimates using a balanced sub-sample of our panel dataset and found similar results with the full sample. Therefore, we have undertaken a number of additional sensitivity analyses, in order to explore the robustness of the results across different model specifications.

In sum, after controlling for the potential endogeneity problem, with the other specifications, our main findings of the GMM remain robust and consistent.

VI. ESTIMATION RESULTS

[17] We are aware that the system GMM estimator has some critical aspects, as Roodman (2009) has shown regarding the instrument proliferation. For this reason we used also alternative methods such as OLS, GLS, Random and Fixed effects estimators that confirm the robustness of the results.

[18] As recommended by Roodman (2009), the number of instruments used in a dynamic GMM estimator should relatively low and smaller than the number of the number of observations. In our analysis we use 36 instruments for both ROA and PROFIT, while 69 instruments have been used for the ROE. Therefore, in both cases the number of instruments is small and lesser than our 2217 observations. The "optimal" number of instruments has been achieved by using the restriction of one lag for levels and two for differenced equations. In addition, we have done alternative estimations by reducing further the number of instruments. Nonetheless, these further reductions worsen the diagnostic tests (specifically, they resulted in a lower Sargan p-value), indicating that our selected number of instruments should be fairly "optimal".

[19] Windmeijer (2005) proposed a correction method for the commonly downward biased estimated standard errors produced by the two-step GMM technique. In particular, he corrects the finite sample biases by the estimated asymptotic variance of the two-step GMM estimator that produces the corrected adjusted Wald Statistics.

In this section, we comment our main results showed in tables 3, 4, and 5 and also discuss the robustness checks for the hypothesis tests.

[TABLE 3,4,5 about here]

Our inference analysis has been conducted with several specifications. Overall, the results are all robust, but – as it has been argued in section 5.2 – system GMM estimation is the optimal method that produces the more efficient and consistent coefficients. In support of this hypothesis, the coefficients of one period-lagged ROE, PROFIT, and ROA are found to be statistically significant in all cases, while they are the highest in terms of magnitude among all the explanatory variables. This seems to imply that the Italian economy is far from a perfectly competitive market structure, and that mid-sized manufacturing firms tend to segment the market by creating market niches, hence they operate in monopolistic competition. [20]

The profitability of mid-sized Italian manufacturing firms tends to be highly persistent over time and, therefore, the lagged dependent variable should be included in the regression models. However, the application of OLS or Fixed Effect estimators of a dynamic specification would result in biased estimated coefficients, because of possible endogeneity of the regressors. Consequently, these estimators are likely to perform poorly. Thus, the results of the static models have been reported simply for the purpose of comparison, while the last column of each table reports the coefficients of reference. On the other hand, all the estimated models denote the presence of some robust regularity among the several specifications and alternative profitability ratios used.

As expected**,** firm profitability is shown to be larger when sales growth rate is positive. This suggests that higher sales growth generates income that partially influences firm's profits. This positive impact is consistent with earlier studies that use the same proxy variable (growth rate of sales) to measure growth opportunity ratio,[21] but also with other empirical studies that adopt different variables such as, for instance, the rate of change in total assets.[22] Moreover, in the case of ROE, past growth is observed to have a greater positive impact on the subsequent profit rate than contemporaneous growth; thus, growth seems to generate dynamic increasing returns. This evidence is in line with previous studies (e.g. Coad, 2007).

Furthermore, the estimated coefficients to capture the risk contribute to firm's performance are negative and almost always statistically significant, i.e. safer companies show higher profits than riskier firms. This is consistent with prior studies (Bonaccorsi, Berger, 2006; Tian, Zeiturn, 2007;

[20] Migliardo (2012) found evidence of high degree of market power in the Italian firms over the same sample period taken into consideration in the present study.

[21] Cowling (2004) and Coad (2007) have shown a significant and positive correlation between sales growth and profits.

[22] E.g. Zeitun and Tian (2007), Nunes *et al*. (2009).

Lee, Li, 2012). Moreover, the negative correlation is more than proportional in the case of the return on equity ratio, as a 1% increase in profit volatility determines a reduction in profits of 1.36% for ROE. In sum, volatility of earnings reduces the value of firms. This finding can be ascribed to the higher risk of default that induces a greater probability of financial distress and larger bankruptcy costs, and, consequently, downgrades firm profits.

The effect of tangibility on profitability at the sample mean is statistically significant (for ROA and PROFIT) and negative (in all other cases). Firms with relatively large levels of tangible assets are less profitable, and this suggests that the Italian manufacturing firms of intermediate size tend to use their fixed assets inefficiently. More specifically, they invest excessively in physical capital over the total assets, and since the marginal efficiency of capital is decreasing, this worsens corporate performance.

In general, the estimated equations show that the firm's size does not affect the pattern of firm's performance;[23] the latter being almost stable along all size classes. This result might be ascribed to the sample structure of our analysis and justifies why the relationship SIZE-PROFIT is weak.

On average and as expected, the leverage variable is negative and significant for all the measures of profitability used. An expansion in the debt ratio of 1% determines a reduction of corporate returns from 0.08% for ROA up to 0.96% for ROE respectively. This indicates that capital structure is too unbalanced toward the financial debt. There are several possible theoretical explanations for our findings. In more detail, such inverse relationship between firm value (ROE) and leverage is justified in literature by the pecking order theory (Myers and Majluf, 1984). [24] According to it, the firms finance their investments at first with internal resources, i.e. profitable firms use their earnings primary; once the endogenous funds are used up, the companies turn to debt financing. Finally, they opt to capital share increase as a last source of funding. Several reasons explain this hierarchy of financing sources: first, the asymmetric information in the financial markets increases the cost of issuing equity[25]; second, old shareholders tend to limit the emission in order to retain control of the company; third, the internal financing strategy allows transaction cost saving. In summary, a profitable company uses less leverage and in so doing determines a higher firm's value that will be positively correlated with corporate performance and negatively linked with the debt. So the results of this study are consistent with the pecking order theory.

[23] Alternatively, we also used either the raw size variable referred to total assets in logarithm term, and the natural logarithm of the number of employees, but in both cases size proved not to be an important factor for firm profitability.

[24] The pecking order theory of capital structure affirms that, all other things being equal, companies seeking to finance a new project or product have a hierarchy of preferred financing options progressing from the most to the least preferred.

[25] The new equity issuing leads to a firm's stock price decline, because investors perceive that managers consider the company overvalued. Thus, the investors are monetizing this overvaluation. As a consequence, the firm's value decreases and whilst the cost of external financing increases.

Moreover, the significant and negative correlation of the other proxy (ROA and PROFIT) dependent variables with leverage can be explained by agency conflicts causing overleveraged firms and adversely affecting their profitability negatively.

In the context of our analysis, the negative relation can be ascribed to several idiosyncratic reasons. On the one hand, mid-sized Italian manufacturing firms seem to choose debt (bank debt) instead of equity, owing to either legal market restrictions (e.g. company profile) and/or credit conditions, which do not allow the recourse to financial markets. On the other hand, tax purposes can address this strategic choice, i.e. firms opt to debt rather than internal capital, because companies benefit from debt tax shields (Modigliani, Miller, 1963).

Finally, for mid-sized Italian manufacturing firms, the previous year's corporate performance has significant positive impact on ROA and PROFIT, while, by contrast, a large ROE implies a decrease of profitability in the following year.[26] This remarkable result can be ascribed to a weak forward-looking strategy of profit management, as it is highlighted by a strategy of overpaid dividends that jeopardizes the performance in the long run.

VII. CONCLUSIONS

This study provides a further contribution to the extensive empirical literature on firm profitability. It focuses on mid-sized Italian manufacturing firms, namely medium and medium-large enterprises, which represent the most dynamic and profitable companies characterizing Italian economy. Firm-specific determinants on profitability and the relationship between corporate structure and firm performance are highlighted.

Several concluding remarks can be drawn from our results. First, since firm returns denote the tendency to persist over time, showing a good resilience, we find support to the persistence of profit hypothesis[27]. This may prove that mid-sized Italian manufacturing firms operate in a context of monopolistic competition, hence they are able to create market niches by specializing in high quality products, differentiating the products, but also being able to establish a customized relationship with their clients. Second, as referred to both leverage and tangibility, mid-sized Italian manufacturing firms' capital structure looks unbalanced. Our findings prove that financial debt (i.e. *leverage*) is relatively high with negative impact on firm profits. Physical assets (*tang*) tend to be outsized, this affects negatively firm performance, because tangible capital is subject to decreasing return to scale.

[26]In general, we would expect a positive sign for the lagged dependent variable. Nonetheless the negative effects for the specific case of ROE ratio (Table 3) is due to the high dividend payments.

[27] Although we know that even the profitability of mid-sized Italian firms has deteriorated in the period 2007-2010 due to the global crisis (Cerved, 2014).

Moreover, our empirical evidence suggests that present growth of sales (and in the case of return on equity also growth occurred in the past) as well as profit volatility (i.e. risk) are important and significant determinants of firm profitability.

In sum, our empirical analysis supplies additional insights for managers as well as for planners of economic policy. The results provide several managerial implications for Italian manufacturing companies of intermediate size. Our evidence indicates that profitable manufacturing firms could achieve better returns, if they adopted a diversification in their financial funding strategy and/or if they modified their allocation of business assets, e.g. by intensifying their intangible assets. From the point of view of the economic policy planner, our results could suggest the adoption of fiscal incentives in order to induce adjustments in the capital structure of this type of firms and, consequently, to enhance their profitability.

Potential extensions of the present study might be an investigation on medium size European manufacturing companies and/or an evaluation of our results within a macroeconomic framework such as DSGE models.

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TABLE 1

Definitions, notations, and the expected effect of the explanatory variables of model on firm profitability, 2004-2010

Variable		Definition	Expected effect	mean	s. d.
Endogenous Variables					
ROE		Return on equity		0.1025	1.1149
Profit		Net profits divided by total assets		0.0227	0.0727
ROA		Return on assets (T.A.)		0.0616	0.0804
Explanatory Variables					
Dimensional Dummy					
	sized1	Dummy equal to 1 if T. A. is less than 100 million	Benchmark	0.4473	0.4973
	sized2	Dummy equal to 1 if T. A. is greater than 100 million and less than 500 mill.	Positive	0.4001	0.4900
	sized3	Dummy equal to 1 if T. A. is greater than 500 million and less than 1 bill.	Positive	0.0941	0.2920
	sized4	Dummy equal to 1 if T. A. is greater than 1 billion and less than 5 bill.	Positive	0.0585	0.2348
tang		Fixed assets to total assets	Undefined	0.2230	0.1538
Leverage		Financial Debt to total assets	Negative	0.2660	0.1935
risk		Standard deviation over time of the firm's return on equity	Positive	0.2133	0.7371
Growth opportunities		Rate of Growth of Sales	Positive	0.0520	0.3316
No. obs		4267			
No. of Firms		1066			

The data are averages from annual observations referring to 2004-2010.

TABLE 2
Pearson's Correlation Matrix of the Variables, during 2004-2010

	roe	Prof.	ROA	sized1	sized2	sized3	sized4	tang	Leverage	risk	growth	nworkers
roe	1.000											
Prof.	0.035**	1.000										
ROA	0.030**	0.784***	1.000									
sized1	0.016	-0.049***	-0.026*	1.000								
sized2	-0.012	0.029*	0.013	-0.746***	1.000							
sized3	-0.004	0.026*	0.023	-0.291***	-0.257***	1.000						
sized4	-0.003	0.013	0.002	-0.219***	-0.193***	-0.075***	1.000					
tang	-0.027*	-0.182***	-0.192***	-0.133***	0.087***	0.040***	0.055***	1.000				
Leverage	-0.032**	-0.397***	-0.347***	-0.025	0.011	0.006	0.027*	0.214***	1.000			
risk	-0.142***	-0.093***	-0.080***	0.010	0.000	-0.004	-0.019	-0.080***	0.042**	1.000		
growth	0.040**	0.098***	0.118***	-0.039**	0.033*	0.003	0.011	-0.053***	-0.034	-0.018	1.000	
N° workers	-0.007	-0.013	0.004	-0.361***	-0.105***	0.364***	0.547***	0.089***	-0.058***	0.000	-0.005	1.000

t statistics in parentheses *Note*: Statistically significant at the *10%, **5% and ***1% level.

TABLE 3

OLS, fixed effect and Random effect for the profitability ROE

ROE	OLS	Random-effect	Fixed-effect	GLS	System GMM
growth	0.0948	0.0659*	0.0452*	0.0904***	0.4162***
	(0.06)	(0.04)	(0.03)	(0.01)	(0.08)
risk	-0.3388*	-0.2523	0.0	-0.2234***	-1.3617**
	(0.19)	(0.24)	(0.00)	(0.02)	(0.61)
tang	-0.4541***	-0.4682***	-0.5816***	-0.3618***	-0.2826
	(0.10)	(0.13)	(0.20)	(0.01)	(0.46)
sized2	0.0189	0.0582	0.1205	0.0357***	-0.0706
	(0.05)	(0.09)	(0.15)	(0.00)	(0.13)
sized3	0.0390	0.0691	0.2287	0.0243***	-0.0837
	(0.05)	(0.08)	(0.15)	(0.01)	(0.10)
sized4	0.0035	0.0461	0.2781*	0.0048	0.1875
	(0.06)	(0.07)	(0.15)	(0.00)	(0.15)
Leverage	-0.6728***	-0.8725***	-0.9183***	-0.5355***	-0.9633***
	(0.14)	(0.17)	(0.18)	(0.01)	(0.40)
constant	0.4387***	0.4742***	0.3882***	0.3549***	0.633763***
	(0.07)	(0.08)	(0.10)	(0.01)	(0.21)
L.roe					-0.5546***
					(0.22)
L.growth					0.6016***
					(0.12)
No. obs.	3092	3092	3092	3092	2217
No. of firms	839	839	839	839	664
R^2	0.072		0.007		
Wald-test					$\chi^2(9)=61.15$
AR(1)					z=-1.1723
					p-value=0.24
AR(2)					z= -1.13
					p-value=0.26
Sargan-test					$\chi^2(59)=59.38$
					p-value=0.46
No of instruments					69

Note: Statistically significant at the *10%, **5% and ***1% level. Robust standard errors in parentheses

TABLE 4

OLS, fixed effect and Random effect for the profitability variable PROFIT.

Prof.	OLS	Random-effect	Fixed-effect	GLS	System GMM
growth	0.0161*	0.0153**	0.0125**	0.017***	0.0563***
	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)
risk	-0.0104***	-0.0106***	0.0	-0.0075***	-0.0349*
	(0.00)	(0.00)	(0.0)	(0.00)	(0.02)
tang	-0.0671***	-0.0831***	-0.1668***	-0.6291***	-0.0901***
	(0.02)	(0.02)	(0.03)	(0.00)	(0.03)
sized2	0.0097***	0.0130***	0.0224***	0.0072***	-0.0067*
	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)
sized3	0.0149**	0.0238***	0.0531***	0.0098***	0.0333**
	(0.01)	(0.01)	(0.01)	(0.00)	(0.02)
sized4	0.0142*	0.0237***	0.0631***	0.0119***	0.028
	(0.01)	(0.01)	(0.01)	(0.00)	(0.02)
Leverage	-0.1370***	-0.1609***	-0.1908***	-0.1254***	-0.0985**
	(0.01)	(0.02)	(0.03)	(0.00)	(0.04)
cons	0.0694***	0.0756***	0.0924***	0.0663***	0.8682
	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)
L. Prof					0.3465***
					(0.12)
L2. Prof					0.0268
					(0.11)
No. obs.	3092	3092	3092	3092	2217
No. of firms	839	839	839	839	664
R^2	0.197		0.105		
Wald-test					$\chi^2(13)=164.97$
AR(1)					z= -4.03
					p-value=0.00
Ar(2)					z=-0.69
					p-value=0.49
Sargan-test					$\chi^2(22)=15.86$
					p-value=0.82
Number of instruments					*36*

Note: Statistically significant at the *10%, **5% and ***1% level. Robust standard errors in parentheses

TABLE 5

OLS, fixed effect and Random effect for the profitability ROA

ROA	OLS	Random-effect	Fixed-effect	GLS	System GMM
growth	0.0230	0.0211**	0.0187*	0.0247***	0.0927***
	(0.01)	(0.01)	(0.01)	(0.00)	(0.02)
Risk	-0.0108	-0.0082	0.0	-0.0089***	-0.0489
	(0.01)	(0.01)	(0.0)	(0.00)	(0.04)
Tang	-0.0838***	-0.0981***	-0.1468***	-0.0803***	-0.0931**
	(0.02)	(0.02)	(0.03)	(0.00)	(0.04)
sized2	0.0079*	0.0089*	0.0144**	0.0081***	-0.0055
	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)
sized3	0.0130*	0.0201***	0.0413***	0.0131***	0.0269**
	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)
sized4	0.0119	0.0168**	0.0440***	0.0116***	0.0143
	(0.01)	(0.01)	(0.01)	(0.00)	(0.02)
Leverage	-0.1312***	-0.1371***	-0.1553***	-0.1214***	-0.0777*
	(0.01)	(0.01)	(0.02)	(0.00)	(0.04)
Cons	0.1112***	0.1137***	0.1225***	0.1066***	0.0939***
	(0.01)	(0.01)	(0.01)	(0.00)	(0.03)
L.ROA					0.4609***
					(0.15)
L.ROA 2					-0.1312
					(0.13)
No. obs.	3092	3092	3092	3092	2217
No. of firms	839	839	839	839	664
Wald-test					$\chi^2(12)=189.91$
AR(1)					z=-5.54
					p-value=0.00
AR(2)					z=-0.10
					p-value=0.91
Sargan-test					$\chi^2(69)=28.14$
					p-value=0.17
Number of instruments					*36*

Note: Statistically significant at the *10%, **5% and ***1% level. Robust standard errors in parentheses