THE EFFECT OF CORPORATE DIVERSIFICATION ON PERFORMANCE. DOES RELATEDNESS PROVIDE A VALUE-ENHANCING STRATEGY?

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Abstract

This paper provides evidence on how the diversification strategy impact on the firm value. Furthermore the paper studies the effect of the levels and types of diversification on the firm value. To achieve this aim, we propose a value model that incorporates the level and type of diversification. The estimation of the model by using the Generalized Method of Moments provides interesting results. Consistent with the value-destroying expectations, we find a reduction in the value of the diversified companies, however there is a non linear relation between the diversification and value, giving rise to an optimal level of diversification. Overall, the results seems to highlight that diversification destroys value. Moreover our results support that related diversification is less value-creating than non-related diversification. This is a surprising results that suggest interesting implications for the management.

Key words: *Industrial diversification, relatedness, value creation, performance* .

JEL classification: G32; G34

1. Introduction

This paper concerns with the consolidated, at least at an international level, scientific debate about the relationship between diversification strategies and performance of the firm. The topic of the corporate diversification is object of scientific investigation from decades and from a wide variety of authors. Till the end of the nineties the vast majority of corporate finance studies on the subject were in accordance with the conclusion that diversified firms are generally traded with a value discount compared to focusing firms operating in the same business[2]. Famous the expression from Sharfstein and Stein (2000) appeared on The Journal of Finance: "in recent years, it has become almost axiomatic among researchers in finance and strategy that a policy of corporate diversification is typically value reducing". However, in the last years a growing number of studies is reversing this conclusions, thus contributing to a renewed interest among the scientific community on this area of research (Graham, Lemmon and Wolf 2002, Maksimovic and Phillips 2001, Campa and Kedia 2002, Villalonga 2004a, 2004b). The width of the debate and the depth of the thematic proposals have not yet answered the basic knowledge problem: does diversification, and what kind of diversification, has a better influence on firm performance?

On a geographic basis many analysis have been conducted (Lins, Servaes, 1999, 2002 Fauver, Houston, Naranjo, 2002, Claessens, Djankov, Fan and Lang, 1999), with the aim to confirm or disconfirm the emerging hypotheses, but no one on the Italian market. Aim of this paper is to fill this gap, testing the main hypotheses proposed in the literature on the Italian industrial context. According to our opinion, the Italian context seems to be particularly rich with interesting cues of research application on account of many peculiarities that distinguish it not only by the countries of Anglo-Saxon tradition but also from other countries of continental Europe. First of all, the Italian firms governance structure is characterized by high ownership concentration (Barca, 1994, La Porta et al., 2002, Faccio, Lang, 2002), more often in the hands of a family, some others in the hands of business groups that, in accordance with financial institutions, by means of pyramidal systems and non-voting shares, control a huge number of firms with a relatively small amount of capital. It is widely recognized in literature (Burkart, et al, 1998, La Porta, 1999, Claessens, Djankov, Fan and Lang, 1999) that, in such a context and associated to higher asymmetric information, the typical "principal vs agent" conflict becomes "large shareholders vs minority shareholders", being the agent strongly conditioned by the narrow relationship of dependence with the large shareholders to the pursuit of their goals. In our opinion, it becomes particularly interesting in Italy to try to investigate the effect that the strategies of diversification produce in terms of impact on firm performance and on the possibility to mitigate or to exacerbate the agency conflicts among the two typologies of shareholders.

Secondly, the italian economic environment presents a large number of elements of inefficiency in the allocation of funds: the number of listed firms is relatively small in comparison to that of other countries having a similar gross domestic product (Carpenter, Rondi, 2000), corporate debt is not issued on the market but is often raised from banks and other financial institutions that frequently have a percentage of share of the same firms, there is a poor presence of institutional investors on financial markets, especially pension funds. In a similar context, the combination of benefits and costs related to diversification is different (Grundfest 1990, Prowse 1990). According to the degree of efficiency and development of the external capital market can be different the relevance for a company of an internal capital market (Matsasuka and Nanda 1997, Khanna and Palepu 1997); benefits provided by diversification strategies, arising from internal capital market, can be even greater in the presence of significant external capital market constraint

[2] Just looking to some finance textbooks it is possible to understand that conventional wisdom among finance scholars suggests that corporate diversification, especially conglomerate diversification, destroys shareholder wealth such that the shares of diversified firms sell at a discount. However, there are many examples of firms, as General Electric, that operate profitably in many industries.

and imperfections.

A third element that may contribute to add interest to this research concerns the growing number of M&A operations in Italy in the last few years. After a first merger wave at the end of the 80's, due to the privatization campaign conducted by the various governments with the aim to reduce the public intervention in the national economy, Italy has been living, since the mid 90's, a second merger wave with the purpose to allow the greatest national firms, including those belonging to financial industry, to reach that dimensional scale necessary to compete with the increasing international competition. After a light decrease in the number of operations following the crisis of financial market between 2001 and 2004, since 2005 the market of M&A in Italy has registered an extraordinary increase in the number of cross-border and diversifying operations. Even in this case, in literature is well known how the peculiar institutional context (La Porta et al., 1998), ownership concentration (Faccio, Lang, 2002), and other governance variables may determine not only the type of operation and the subsequent levels of performance, but also the benefit distribution among various stakeholders, in particular majority and minority shareholders (Mork et al., 1990, Lins, Servaes, 2002, La Porta et al, 2002).

The analysis has been developed using a sample of 150 Italian firms, both listed or not, during a period of 27 years.

The present work is structured as it follows. In the second paragraph there is a literature review that pointed out the main hypotheses concerning the relation between diversification and value. In the third paragraph we present the data, the sample selection criteria and the econometric model applied. The last paragraph is about the main findings of our research and the future directions for new studies on this topic.

2. Literature review and hypothesis

The relation between diversification and performance has long been a central topic of research in strategic management (Ansoff 1965, Datta, Rajagopalan and Rasheed 1991, Goold, Campbell and Alexander 1994, Hoskisson and Hitt 1990, Montgomery 1994, Palich, Cardinal and Miller 2000, Ramanujam and Varadarajan 1989, Rumelt 1974). In spite of the persistent efforts from researchers over the years, clear-cut conclusions remain evasive.

The connection between diversification and performance depends on the way the benefits and costs related to this corporate strategy combine. Firms choice to diversify their activities in more businesses when the benefits of diversification overcome its costs, while if the opposite occurs companies prefer to stay focused.

It follows a short overview of the literature, according to the need to explain the research hypothesis, while a Broad (deep) review of the literature is provided by Ramanujam and Varadarajan (1989), Hoskisson and Hitt (1990), Datta, Rajagopalan and Rasheed (1991) and Dess, Gupta, Hennart and Hill (1995) and more recently by Martin and Sayrak (2003).

2.1 Positive relation between diversification and value

One stream of research points to diversification as a value-increasing strategy for the firm. In this case the hypothesis is that "*corporate diversification has a positive impact on firm value*". According to this view the benefits of diversification outweight the possible costs (Gertner et al. 1994, Pandia and Rao, 1998, Villalonga 2000, Hadlock et al. 2001). This was the traditional view in the industrial organization literature that considered diversification and performance as linearly and positively related (Gort 1962).

From the *resource-based perspective*, we might observe diversification in firms that possess excess capacity in resources and capabilities that are transferable across industries (Penrose, 1959). Diversification provides to the firms operational synergies (Lubatkin and Rogers 1990, Markides and Williamson 1994, Wernerfelt 1991, Peteraf 1993, Morecroft 1999). It is relevant the effect of

scale economies (Chandler 1997) or scope economies (Panzer and Willig 1979, Panzar and Willing 1981) whereby the diversified firm is an efficient form for organizing economic activities[3].

For a *market power perspective* there are three different anticompetitive motives for diversification (Scherer 1980, Seth 1990, Villalonga 2000): 1) cross-subsidization and the use of the profits generated by the firm in one industry to support predatory pricing in another (Palepu 1985),. 2) the adoption of colluding strategy with other firms that compete with the firm simultaneously in multiple markets, or the mutual forbearance hypothesis of multi-market competition (Edwards 1955). 3) the establishment of reciprocal buying strategy with other large firms in order to squeeze out smaller competitors (Seth 1990, Montgomery 1994, Grant 1995).

According to a *financial approach*, there should be a *coinsurance effect* derived from combining businesses whose cash flows are less than perfectly correlated, providing a tax benefit related to the fact that the tax liability of the diversified firm may be less than the cumulated tax liabilities of the different business units (Lewellen 1971). A risk reduction, and so reduction in the bankruptcy probabilities, increases the debt capacity and improves the ability to take advantage of the tax benefits of debt financing (Lewellen 1971, Madj and Myers 1987, Berger and Ofek 1994, Berger and Ofek 1995, Servaes, 1996). Multi-segment firms can benefit from the advantage to access easily to external funds to finance growth (Meyer, Milgrom and Roberts, 1992).

Still based on a financial approach, the diversification strategy provides a superior means of funding an *internal capital market* (Lamont 1997, Stein 1997, Peyer, 2001)[4]. Internally raised equity capital is less costly than funds raised in the external capital market. The firm avoids the transaction costs, as well as the costs of information asymmetry, associated with external finance. Managers keep an higher discretionary power and can exercise superior decision control over project selection.

2.2 Negative relation between diversification and value

An opposite stream of research, theorizing a prevalence of the costs of diversification rather than the benefits, is based on the evidence obtained in the corporate finance literature; it considers diversification as a value-destroying strategy and multi-segment firms are traded at a discount (Lang and Stulz 1994, Berger and Ofek 1995, Servaes 1996, Rajan, Servaes and Zingales 2000, Whited 2001, Lamont and Polk 2001 and 2002). Due to the fact that the costs of diversification outweight the possible benefits, it is assumed that "*corporate diversification has a negative impact on firm value*".

According to an *inefficiency story*, compared to the consequence of opportunistic behaviours, diversified firms do a worse job in allocating their resources than focused firms (Harris et al 1982, Lamont 1997, Rajan et al 1997, Kurt and Montgomery 1981, Bradley 1988, Seth and John 1990, John and Ofek 1995)[5]. This inefficiency could be a result of the information asymmetry problems between headquarter and divisions (Wulf 1998, Scharfestein and Stein 2000). It can lead to power struggles between divisions (Rajan and Zingales 1998, Rajan, Servaes, and Zingales 2000). There are higher coordination costs, control costs over the managers (Markides 1992).

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[3] For example, the firm may use the same marketing and distribution channel to market a variety of goods or services. Similarly, the firm may be able to utilize its corporate legal and financial staffs to support a variety of different industries. A different perspective in the efficiency hypothesis explanation is related to the creation and the exploitation of internal labour market. Many authors (Williamson 1975, Grant 1995, Khanna and Palepu 1999) argue that conglomerates benefit of a more efficient internal labour market, devoid of frictions and able to guarantee specialized personnel at each level and at a very low costs and times compared to traditional external labour market.

[4] The creation and the exploitation of the internal capital market is typical of large unrelated diversified firms (Stein, 1997, Peyer, 2001). While there have been proposed in literature opposite conclusions (Lamont, 1997, Scharfstein, 1998, Shin e Stultz, 1998, Rajan, Servaes e Zingales, 2000, Scharfstein e Stein, 2000), is common opinion (Alchian, 1969, Williamson, 1975, Gertner, Scharfstein, Stein, 1994, Fluck e Lynch, 1996, Stein, 1997) that internal capital markets have a positive influence on the creation of firm value thanks to improved capital budgeting procedures.

[5] Expecially conglomerates are supposed to generate inefficiency (Berger and Ofek 1995, Rajan et al 2000, Sharfstein 1998, Sharfstein and Stein 2000).

According to the agency theory, diversification can somehow exacerbate *managerial agency problems*, resulting from the pursuit of managerial self-interest at the expense of stockholders (Fama and Jensen 1983, Amit and Livnat 1988, Lang and Stulz 1994, Denis et al. 1997). Managers may seek to diversify because it is expected to (1) increase their compensation (Jensen and Murphy, 1990), power and prestige or, in general, to benefit of empire building strategies (Jensen 1986, Stultz 1990); (2) make their positions with the firm more secure (i.e., entrench themselves) by making investments that require their particular skills via manager-specific investments (Shleifer and Vishny 1989 and 1990); or (3) reduce the risk of their personal investment portfolio by reducing firm risk since the managers cannot reduce their own risk by diversifying their portfolios (Amihud and Lev, 1981). Moreover, managers of diversified firms enjoy more free cash flow and less market control; it follows an increment of shirking and more problems of under and over-investment (Stulz 1990, Berger and Ofek 1995, Matsusaka and Nanda 1997).

2.3 Curvilinear relation between diversification and value

As such two previous mentioned linearly relation hypothesis are not conclusive, other approaches were suggested and investigated.

Because of these myriad benefits and costs, it is difficult to predict *a priori* the net impact of benefits and costs associated with corporate diversification on firm value. The combination of benefits and costs can provide a changing net result according to the different level of diversification. In particular, it is possible to observe a *non-linear relation between diversification and firm value* according to the fact that an optimum level of diversification exists balancing the benefits and costs of diversification strategy and moving further in the diversification level provides marginal decreasing utility (Jones and Hill 1988, Montgomery and Wernerfelt 1988). According to the resource-based view, at least initially, expansion into product lines could be expected to improve firm value by better exploiting economies of scale and scope. Although there are benefits associated with diversification, there are also costs arising from potential organizational inefficiencies, coordination costs, governance costs, employee shirking (imperfect monitoring) and the costs of learning a new business. Due to these limits on managerial capabilities, we might expect to observe diminishing marginal returns in the relation between firm value and diversification (see also Rothaermel 2001). Therefore, we should observe an inverted-U shape.

Grant, Jammine and Thomas (1988) show that profitability increases with product diversity until certain point, and that it begins to decrease beyond such point. This was one of the first paper suggesting the existence of an inverted U-shape relation. Palich, Cardinal and Miller (2000), through a meta-analysis on the functional forms of the diversification and performance relation, suggest that diversification has positive effect on value, but the returns fall beyond some point where the optimal is reached. In particular, after a certain threshold the effect of diversification on performance can be value-destroying or, as observed by Markides (1992), beyond a certain point the marginal benefits from diversification are best explained as a decreasing function.

2.4 Diversification and value relation reliant on relatedness

The abovementioned theoretical motivations underline benefits and costs of diversification which are not mutually exclusive, so it is not surprising that empirical works have found it difficult to differentiate among them. The controversial outcomes resulted can be driven by the lack of the due consideration, and control, for the type of diversification. Distinguish between related and unrelated diversification is crucial to explore the effect on firm's value[6].

Related diversification is based on operational synergies related to: (1) *resource sharing* in the value chains among businesses, and (2) the transfer of skills, which involves the transfer of knowledge from one value chain to the other. Thus, related diversification is based on the sharing

[6] Further details on the definitions of *related* and *unrelated* diversification were already available in the works of Ansoff (1958), Lewellen (1971) and Rumelt (1974).

and transfer of skills connected to tangible resources (plant and equipment, sales forces, distribution channels) and intangible (brand names, innovative capabilities, know-how). Conversely, *unrelated diversification* is associated with the financial synergies hypothesis, which states that firms diversify to benefit from the economies of an internal capital market and an internal labor market, to obtain tax benefits, and to reduce business risk (coinsurance argument). Financial resources, which are more mobile and less rare and thus likely to create less value than other types of resources (Hoskisson and Hitt 1990), are associated with unrelated diversification.

Related diversification strategies are mainly connected to positive effects on firm's value, while *un*related diversification strategies are mainly connected to some negative effect on firm's value. In particular, it could be argued that related diversification is closer to efficiency reasons; by restricting the attention to related diversification the relation between diversification and performance becomes mainly positive (Lecraw 1984). Vice versa, *un*related diversification might be consistent with agency theories, that can explain why diversified firms, especially conglomerates, make less profits and have a lower market value.

Part of the empirical literature found support for the superiority of related over unrelated diversification by sharing operational resources and skills across multiple businesses (Bettis 1981, Rumelt 1974 and 1982, Hoskisson and Hitt 1990, Markides and Williamson 1994, Montgomery 1994), while many others researches found no effect about the role of relatedness in the diversification and performance relation (Christensen and Montgomery 1981, Grant, Jammine, and Thomas 1988, Hill 1983, Hill, Hitt, and Hoskisson 1992, Montgomery 1985).

Whether it is not clear the evidence regarding which type of diversification is better, it is frequently argued that *diversification into related business provides better value and it positively affect firm's performance* (Bettis 1981, Markides and Williamson 1994). At least, relatedness could mitigate the costs associated to diversification strategies.

3. Methodology and variables

The empirical analysis has taken into account the effect on corporate value of the degree and direction, related as well as unrelated, of diversification. This approach permitted us to directly identify the sign and magnitude of the relation between diversification and value, differentiating between the effect of related and unrelated diversification. To this end, the following model was applied:

$$Value = f(\text{Diversification, control variables})$$

Corporate value is commonly approximated by some measures of performance. Corporate performance is a multidimensional concept. As illustrated by Venkatraman and Ramanujam (1986): "...the treatment of performance in research settings is perhaps one of the thorniest issues confronting the academic researchers today". We used three financial performance measures. *Model A* is focused on the measurement of the relation between diversification and value revealed by an accounting-based measure of performance (Hitt et a1. 1997, Tallman and Li, 1996). Accounting-based performance measures are derived from the annual statements and reflect the firm's past performance. In the model A we considered the variable Roa, defined as earnings before interest and taxes (EBIT) relative to total assets. As this measure is strongly influenced by the accounting standards employed and can be subject to managerial manipulation, we have also used a market-based measure (*Model B*). Based on the assumption of a semi-strong form of market efficiency (i.e. security prices reflect all publicly available information), market-based measures reflect the present value of future streams of income (Seth 1990). Put differently, market-based measures are used as a forward-looking measure of firm performance since, theoretically, a firm's market value reflects the expected stream of future cash flows. The accurateness of this measure depends on how well the investors are able to determine the value of the firm, taking into account future earning streams. In the model we used the annual stock return as a market-based performance measure. The maindrawback of this measure is that it restricts the study just to listed companies. Furthermore, we

have also used a measure that incorporates both accounting-based and market-based elements (Amit and Livnat 1988, Nayyar 1992). *Model C* is based on the market-to-book ratio that is an acceptable proxy of the Tobin's Q. It is calculated as the market value of the firm divided by its book value (Kim and Lyn 1987, Shin and Stulz 1998). Under the assumption of efficient markets, the market value of assets represents the unbiased present value of expected current and future cash flows discounted at the risk-adjusted cost of capital (Lang and Stulz 1994). This measure thus provides information about the value of a firm as a going concern, and thus reflects investors' valuation of both the tangible and intangible assets of the firm. Also this measure restricts the study just to listed companies.

To measure diversification was crucial identifying the degree of diversification and associated relatedness. This was done by using the number of business segments to define product diversification, taking into account the amount of sales in each business segment and identifying the degree of relatedness for each segment. In Italy, diversification is assessed through the Ateco 2004 code (elaborated by Istat, the Italian National Institute of Statistics), which is similar to the Standard Industrial Codes (S.I.C. code). Specifically, entropy indicators were employed in the empirical analysis as the main measures to operationalize diversification, as they allowed the objectivity of the product-count measures to be combined with the ability to apply the relatedness concept categorically, weighting the businesses by the relative size of their sales (Jacquemin and Berry 1979, Palepu 1985). Entropy measures consider simultaneously the number of businesses in which a firm operates, the distribution of a firm's total sales across industry segments, and the different degrees of relatedness among the various industries (the relative importance of each segment for firm sales). We used the total diversification index (DT) to measure the entire level of diversification of a firm. The entropy measure of total level of diversification (DT) is calculated as $\Sigma P_j * \ln(1/P_j)$, where P refers to the proportion of sales in business segment j and ln(1/pj) is the weight for that segment. Moreover, the DT variable is a better diversification measure compared to the Herfendahl index because, being able to measures the degree of relatedness among the various industries, it can be decomposed into the related and unrelated components of diversification. DR is the related diversification index resulting from businesses different at 3 or 4-digit segment, within a 2-digit industry group. For example, Barilla, operates in Pasta production industry and in Sauce industry, different at 4-digit; both are related. Vice versa, DU is the unrelated diversification index resulting from businesses in different 2-digit industry groups. For example, it is unrelated a firm operating in Paper and Allied Products and Textile Mill Products, different at 2-digit industry code. Villalonga (2000) claimed that in many researches on diversification there were some data trouble in the collection and treatment of data. The related diversification index (DR) and the unrelated diversification index (DU) take into account the roles of all business units in which the firm is involved, without over-emphasizing only those business segments with higher proportions of sales. To avoid mechanical treatment of data we used some rational adjustment, jointly with the difference in the numbers on digits in the Ateco Code, to appreciate the type of diversification. We considered as related two businesses when they provide a product or service to a similar group of customer, sharing the same technology in the production system or operating in the same industry as client and supplier. For example, Clothing industry and Textile industry, that are different at 2 digits, are considered complementary, and so related. Overall, these adjustments regarded around 7% of the sample (around 6% of the listed firms). Therefore, the direct effect of DT, DR and DU on corporate value was investigated.

The empirical analysis is run as it follows, relying, alternatively as depended variable, on an accounting-based performance measure (Roa), a market-based performance measure (annual stock return) and a combination of both (market-to-book ratio).

The general model is based on the effect of the entropy total diversification measure to appreciate the existence of a positive or negative relation between diversification and value (*model 1*).

$$Value_{it} = b_0 + b_1\, DT_{it} + b_2\, \text{Leverage}_{it} + b_3\, \text{Size}_{it} + b_4\, \text{Tangibility} + b_5\, \text{OwnershipConcentration}_{it} + b_7\, \text{Growth opportunity} + \varepsilon_{it}$$

In the model the subscript i refers to the firm, while t concerns to the time period. Instead, εit represents the random disturbance

In addition, to see if the combination of benefits and costs of diversification can have different effect according to the level of diversification, a non linear relation is appreciated through the inclusion in the model of the squared value for the total diversification variable (DT^2); the squared term allows to verify the existence of a non-monotonic effect of diversification (*model 2*).

$$Value_{it} = b_0 + b_1\, DT_{it} + b_2\, DT^2_{it} + b_3\, \text{Leverage}_{it} + b_4\, \text{Size}_{it} + b_5\, \text{Tangibility} + b_6\, \text{OwnershipConcentration}_{it} + b_7\, \text{Growth opportunity} + \varepsilon_{it}$$

Moreover, to appreciate the different effect of the type of diversification, related or unrelated, on corporate value, the entropy measure of related diversification (DR) and unrelated diversification (DU) are tested in the *model 3*, without the presence of the total diversification variable (DT).

$$Value_{it} = b_0 + b_1\, DR_{it} + b_2\, DU_{it} + b_3\, \text{Leverage}_{it} + b_4\, \text{Size}_{it} + b_5\, \text{OwnershipConcentration}_{it} + b_7\, \text{Growth opportunity} + \varepsilon_{it}$$

To take under control the overall degree of firm's diversification, and appreciate the effect of relatedness on performance model 4 encloses DT in the previous model. Here we took into account the fact that DR is sensitive to the number of business segments of a firm by including both DR and DT in the regression (and doing the same considering DU and DT)[7]. To avoid problems of multicollinearity, and in general to have unbiased analysis, due to the fact that DT is equal to DR plus DU, in the *model 4.1* we consider concurrently DT and DR while in *model 4.2* we consider concurrently DT and DU, as it follows:

$$Value_{it} = b_0 + b_1\, DT_{it} + b_2\, DR_{it} + b_3\, \text{Leverage}_{it} + b_4\, \text{Size}_{it} + b_5\, \text{Tangibility} + b_6\, \text{OwnershipConcentration}_{it} + b_7\, \text{Growth opportunity} + \varepsilon_{it}$$

$$Value_{it} = b_0 + b_1\, DT_{it} + b_2\, DU_{it} + b_3\, \text{Leverage}_{it} + b4\, \text{Size}_{it} + b_5\, \text{Tangibility} + b_6\, \text{OwnershipConcentration}_{it} + b_7\, \text{Growth opportunity} + \varepsilon_{it}$$

The analysis will be based on the whole sample and then, only on listed firms sample. In the whole sample a dummy listing variable to discriminate for the presence of listed firms.

In the analysis we control for other firm characteristics, which have been traditionally considered in the literature as determinants of corporate value. Theoretical and empirical studies have shown that leverage, tangibility, size and ownership affect corporate vale. These variables were also included in this empirical study to underline the relation between diversification strategies and corporate value. Firm *leverage* traditionally provides some benefits (tax shield, managerial discipline) and costs (financial distress, agency problems) that affect corporate value (Rajan and Zingales 1995). It is measured as the ratio of total financial debt to total financial debt plus equity. Firm *size* is related to the amount of resources under managerial control. Expecially large firms may incur greater coordination costs, which could reduce the synergy of diversification. We measure firm size by the natural logarithm of the book value of assets (Li and Greenwood 2004, Mansi and Reeb 2002). *Tangible* assets are also among the traditional factor affecting corporate value because of its important role in the firm's strategy, management and organization. Asset tangibility is measured as the ratio of property, plants, and equipment to total assets. The governance of a firm, including its strategy formulation and financial decision-making, is strictly influenced by *ownership structure*. The models presented here contain a variable that takes into account a firm's ownership structure, considering the percentage of shares held by the primary shareholder.

There are some econometrician issues to deal with. The estimation method was selected in order to avoid *unobservable heterogeneity* and *endogeneity*.

[7] A detailed description of the content validity of measure of relatedness are provided in Robins and Wiersema (2003).

In fact, because firms are *heterogeneous* there are always characteristics influencing firm's performance which are difficult to measure or hard to obtain, and which do not enter our model. Therefore, if we do not control for this heterogeneity, we will run the risk of obtaining biased results. Consequently, the error term (ε) in our models, has been splitted into three components: firm-specific effect (η_i.), time-specific effect (*dt*) and the random disturbance (υ_{it}).Unlike cross-sectional analysis, the panel data methodology has a great advantage in that it allows us to control for unobservable heterogeneity through an individual effect, η_i. We also included the variable *dt* to measure the temporal effect with the corresponding dummy variables, taking into account the effect of macroeconomic variables on corporate performance. Therefore, consistent with Bond and Meghir (1994), our approach controlled for unobservable firm-specific fixed effects and for the time dummy variable.

Moreover, the clear *endogeneity* between diversification and performance, and in general with regards the corporate decision variables in our model, could significantly affect the estimation results. Statistically, endogeneity means that the model's errors are not truly random, and practically, this means that a regression is mis-specified in a way that makes identifying a causal effect between two economic variables difficult. There are several potential sources of endogeneity. One of the more relevant in the present analysis is reverse causality. Many studies observed that if in some situation diversification (cause) leads to change in performance (effect), in others cases it is the other way around, and the relation between diversification and performance can have a reverse explanation. While a wide literature observed that diversified firms are traded at a discount, recent researches showed that these firms are valued at a discount before they diversify (Villalonga 2000, Graham, Lemmon and Wolf 1999, Hyland and Diltz 2002). As argued by Campa and Kedia (1999 and 2002) the choice to diversify is endogenous, and not exogenous, and is related to the same reasons that contribute to the loss in value. They found that the diversification discount turns into a premium when endogeneity is considered into the analysis. An additional example regards profitability and leverage; it is certainly possible that that some variables, as leverage, influences profitability, but it is also possible the other way around, that profitability can influence leverage. Although high leverage levels may lead firms to experience poor performance, poor performance may also lead to higher observed leverage levels (either because distressed firms borrow more, or because their market values decline, which increases their leverage ratios). As a consequence, due to the fact that variables may correlate with the error term, seriously affecting the estimation results, it may be preferable to use instrumental variables[8].

Therefore, the panel-data methodology and estimation by the Generalized Method of Moments (GMM) together allow studies of the dynamic nature of performance at the firm level, thereby eliminating unobservable heterogeneity and controlling for the endogeneity problem. The GMM approach was used. Specifically, as suggested by Arellano and Bond (1991), this equation was estimated in first differences, using lag effects as instruments. However, Monte Carlo simulations suggest that the first-difference GMM estimator could display large finite sample biases and very low precision in the estimation of the autoregressive parameter (Blundell and Bond 1998)[9]. Blundell and Bond (1998) address these shortcomings of the first difference GMM estimator by introducing the GMM in system estimator[10]. We use all the right-hand-side variables in the models, two and three times lagged as instruments. Specifically, in order to eliminate the individual effect, we took first differences of the variables, and then we estimated the models thus obtained. This approach is correct if there is no second-order serial correlation between error terms of the first-differenced equation. In our models, this hypothesis of second-order serial correlation is

[8] Testing the hypothesis of endogeneity explicitly involves testing for endogeneity in the variables, to determine whether there is a simultaneity bias in the OLS regression results, using a standard Hausman test. The results of the test of simultaneity suggest the presence of this problem.

[9] Weak instruments in difference GMM motivated the development of system GMM (Blundell and Bond 1998).

[10] System GMM augments difference GMM by estimating simultaneously in differences and levels, the two equations being distinctly instrumented.

always rejected. The statistics m_1 and m_2 were used to test for the lack of serial correlation (for completeness, we also tested for a lack of first-order serial correlation through the m_1 test). Concerning the instruments, the Sargan statistic, which tests for the presence of over-identifying restrictions and for the validity of instrumental variables, is reported.

4. Data and descriptives

The analysis is based on the data provided by Mediobanca - Ricerche & Studi. The R&S Directory, the first edition of which appeared in 1976, is an annual publication that contains a broad range of high-quality financial and non-financial information on the largest companies, in terms of total assets and value added, based in Italy; the aim is to provide a fully comprehensive financial profile of their operations, enabling the user to gain in-depth knowledge of large leading Italian companies[11]. The sample consisted of an unbalanced panel made up of 180 Italian firms (76 listed) evaluated in the period from 1980 to 2006 (27 years). Firms belonging to the financial-services industry were excluded. The entire sample comprised 2085 observations, and the listed sample 690 observations. This is a unique database, created using the R&S books until the 2000 and the PDF-files up to the 2006. R&S is the only database on Italy with details on the numbers and the amount of sales for each business segments, that allows analysis on the corporate diversification; we get all the data available with the features we need.

Table 1 shows the main descriptive statistics for the variables used in the analysis, sorted by the whole sample and the listed sample.

Table 1 – Descriptive statistics for the whole sample and the listed sample.

	Whole sample			**Listed firms sample**		
Variables	*Mean*	*Median*	*Standard deviation*	*Mean*	*Median*	*Standard deviation*
DT (total diversification)	,391	,216	,445	0,479	0,431	0,453
DR (related diversification)	,172	,000	,298	0,199	0,000	0,291
DU (unrelated diversification)	,219	,000	,358	0,279	0,000	0,386
ROA	,072	,062	,082	0,060	0,054	0,068
Market-to-Book (MtB)				1,439	1,245	1,067
Annual stock return				0,031	0,029	0,030
Leverage	,445	,453	,235	0,423	0,426	0,197
Non-Debt Tax Shield	,061	,047	,347	0,048	0,043	0,270
Ownership concentration	,657	,640	,258	0,509	0,510	0,199
Tangibility	,341	,324	,153	0,394	0,379	0,155
Size	20,02	20,08	1,31	20,13	20,16	1,47
No. observations	2085			690		

Some variables, such as the leverage, seem symmetrically distributed while others, such as the diversification measures, are quite asymmetrically distributed. The major part of the diversified firms adopted an unrelated strategy. The Du variable showed an higher value (0.22) compared to the Dr variable (0.17). Also numerically, taking into account that many firms adopted both strategies, there were more firms implementing a strategy of unrelated diversification compared to the number of related diversified firms. Moreover, listed firms have a poor performance compared to the whole sample. The standard deviation of the variables is basically higher for the whole

[11] R&S provides a detailed balance sheet analysis, complemented by a profile of the company's history and its operations, the names of its directors, and major shareholders, figures on production and market share, details of production facilities, sales, employees and, in the case of listed companies, stock market performance.

sample compared to the listed firms; just looking at the size and tangibility variables (and at some diversification variables) it shows different patterns.

Tables 2 compares the main descriptives, sorting the samples by the number of business segments to define diversity. Specifically, table 4 compares the results for firms that are focused (specialising in one industry) or diversified (operating in two or more industries).

Table 2 – Comparison across focused firms, specialising in one industry, and diversified firms, operating in two or more industries.

	Whole sample			**Listed Firms sample**		
	Focused (1 segment)	**Diversified** (more than 1 segment)	*t-test*	**Focused** (1 segment)	**Diversified** (more than 1 segment)	*t-test*
Variables	Mean	Mean		Mean	Mean	
Roa	0,079	0,065	3,87***	0,079	0,048	5,94***
Market-to-Book (MtB)				1,522	1,386	1,63*
Annual stock return				0,029	0,033	-1,29*
Leverage	0,431	0,460	-2,85***	0,438	0,413	1,67*
Non-Debt Tax Shield	0,055	0,067	-0,81	0,053	0,044	4,33***
Ownership concentration	0,681	0,634	4,13***	0,543	0,489	1,33*
Tangibility	0,335	0,347	-1,76*	0,411	0,383	2,28**
Size	19,84	20,20	-6,37***	19,97	20,23	-2,30**
# Observations	1030	1055		267	423	

t test: (*), (**) and (***) indicate a p-value significance at 0.10, 0.05 and 0.01 level, respectively.

Some interesting differences arise from comparing focused firms and diversified firms. The *t* test on the difference between the means shows significant relevance with a tolerance at 10%. Diversified firms have lower Roa and market-to-book, compared to the focused firms, and also have less ownership concentration and tangibility while being larger in size.

5. Results

This section presents the results obtained by estimating the models with the GMM technique. The key identifying assumption, that there is no serial correlation in the error terms, was verified by testing for the absence of a second-order serial correlation in the first residuals. The Sargan statistic, which confirms the absence of correlation between the instruments and the error term[12], as well as the m_2 tests, suggested that the feature of our model for the sample of Italian firms was valid, well-specified, and consistent[13].

We applied the empirical models for three performance measures as dependent variable. We showed the results using an accounting-based measure (Roa) as proxy of corporate value in table 3 (whole sample) and table 4 (listed sample); the results on a market-based measure (annual stock return) are showed in table 5; while in table 6 a combination of accounting-based and market-based measure (market-to-book ratio) is applied as dependent variable. In all the three tables we showed,

[12] We have applied some straightforward techniques that provide the basis for some minimally arbitrary robustness tests: simply cutting the number of instrument count (lag) and examining the behaviour of the coefficient estimates and overidentification tests. As suggested by Roodman (2007), we repeatedly select random subsets from the collection of potential instruments and look how key results such as coefficients of interest and the p value on the Sargan statistic vary with the number of instruments. None of the coefficients systematically lose significance as the instrument count falls, this should not worries about overfitting problems.

[13] Specifically, the Sargan statistic confirms the absence of correlation between the instruments and the error term in all the models, and the hypothesis of serial correlation in the residuals is always rejected.

first, the results of our basic model that traditionally considered diversification and a set of control variables as determinants of a firm's value. Then, we commented the evidence about the existence of potential non-linearity in the relation between diversification and firm value, obtained by incorporating the square of the diversification variable in the model.

Table 3 – The effect of diversification on Roa (Whole sample).

	Whole sample - Roa									
Variables	**Model 1**	p-value	**Model 2**	p-value	**Model 3**	p-value	**Model 4.1**	p-value	**Model 4.2**	p-value
Constant	.0055	0.000	.005	0.000	0,005	0.000	0,005	0.000	0,005	0.000
DT (total diversification)	-0,022	0.041	-0,075	0.003			-0,017	0,071	-0,038	0.009
DT^2 (total diversification squared)			0,041	0.023						
DR (related diversification)					-0,031	0.036	-0,016	0,097		
DU (unrelated diversification)					-0,012	0,201			0,022	0,074
Leverage	-0,038	0.001	-0,039	0.001	-0,037	0.001	-0,037	0.001	-0,037	0.001
Size	0,011	0,153	0,01	0,164	0,01	0,164	0,011	0,156	0,01	0,163
Tangibility	-0,118	0.000	-0,119	0.000	-0,118	0.000	-0,118	0.000	-0,118	0.000
Ownership concentration	0,006	0,483	0,004	0,533	0,006	0,488	0,005	0,501	0,005	0,505
Growth opportunity: Sales Growth										
m1	-16.60	0.000	-16.44	0.000	-16.61	0.000	-16.61	0.000	-16.60	0.000
m2	1.18	1,654	1.04	2,059	1.19	1,638	1.19	1,63	1.16	1,697
Sargan test	689,17	0.000	690.68	0.000	694,05	0.000	692,3	0.000	692.9	0.000

Notes: (*), (**) and (***) indicates that coefficients are significant at 10, 5 and 1 percent level, respectively. The test m2 is second order autocorrelation of residuals under the null of no serial correlation. Sargan test is test of the overidentifying restrictions, under the null of instruments' validity.

Table 4 – The effect of diversification on Roa (Listed sample).

	Listed sample - Roa									
Variables	**Model 1**	p-value	**Model 2**	p-value	**Model 3**	p-value	**Model 4.1**	p-value	**Model 4.2**	p-value
Constant	.001	0.249	.001	0.258	.001	0.275	.001	0.285	.001	0.296
DT (total diversification)	-.026	0.020	-.071	0.013			-.017	0.158	-.039	0.004
DT^2 (total diversification squared)			.036	0.088						
DR (related diversification)					-.038	0.005	-.021	0.094		
DU (unrelated diversification)					-.016	0.186			.022	0.086
Leverage	-.057	0.000	-.063	0.000	-.059	0.000	-.059	0.000	-.059	0.000
Size	-.029	0.000	-.029	0.000	-.028	0.000	-.028	0.000	-.028	0.000
Tangibility	.023	0.251	.022	0.267	.023	0.249	.022	0.254	.023	0.245
Ownership concentration	-.019	0.120	-.018	0.147	-.020	0.107	-.020	0.102	-.020	0.096
Growth opportunity: Sales Growth										
m1	-9.82	0.000	-9.69	0.000	-9.75	0.000	-9.76	0.000	-9.78	0.000
m2	-0.70	0.486	-0.79	0.430	-0.68	0.496	-0.68	0.495	-0.68	0.494
Sargan test	389.59	0.001	388.32	0.001	387.70	0.001	387.45	0.001	387.04	0.001

Notes: (*), (**) and (***) indicates that coefficients are significant at 10, 5 and 1 percent level, respectively. The test m2 is second order autocorrelation of residuals under the null of no serial correlation. Sargan test is test of the overidentifying restrictions, under the null of instruments' validity.

Table 5 – The effect of diversification on Annual Stock Return (Listed sample).

	Listed sample - Annual Stock return									
Variables	**Model 1**	p-value	**Model 2**	p-value	**Model 3**	p-value	**Model 4.1**	p-value	**Model 4.2**	p-value
Constant	-.001	0.230	-.002	0.129	-.001	0.233	-.001	0.233	-.001	0.233
DT (total diversification)	.003	0.243	-.067	0.159			.018	0.333	-.044	0.072
DT^2 (total diversification squared)			.055	0.147						
DR (related diversification)					-.044	0.072	-.062	0.004		
DU (unrelated diversification)					.018	0.333			.064	0.004
Size	.002	0.903	.001	0.955	.001	0.956	.001	0.956	.001	0.956
Leverage	.030	-.032	.016	0.620	.024	0.433	.024	0.433	.024	0.433
Tangibility	-.118	-.210	-.125	0.008	-.107	0.022	-.107	0.022	-.107	0.022
Ownership concentration	.018	0.460	.018	0.453	.013	0.583	.013	0.583	.013	0.583
Growth opportunity: Sales Growth										
m1	-5.48	0.000	-5.44	0.0000	-5.23	0.00	-5.23	0.000	-5.23	0.000
m2	-2.09	0.036	-2.07	0.0384	-2.30	0.021	-2.30	0.021	-2.30	0.021
Sargan test	117.95	0.999	116.68	1.0000	113.4	1.00	113.41	1.000	113.4	1

Notes: (*), (**) and (***) indicates that coefficients are significant at 10, 5 and 1 percent level, respectively. The test m2 is second order autocorrelation of residuals under the null of no serial correlation. Sargan test is test of the overidentifying restrictions, under the null of instruments' validity.

Table 6 – The effect of diversification on MtB (Listed sample).

	Listed sample - MtB									
Variables	**Model 1**	p-value	**Model 2**	p-value	**Model 3**	p-value	**Model 4.1**	p-value	**Model 4.2**	p-value
Constant	.0705	0.110	.096	0.035	.072	0.102	.072	0.102	.072	0.102
DT (total diversification)	-.468	0.408	2.821	**0.083**			-.573	0.327	-.052	0.946
DT^2 (total diversification squared)			-2.533	**0.031**						
DR (related diversification)					-.052	0.946	.520	0.434		
DU (unrelated diversification)					-.573	0.327			-.520	0.434
Leverage	-.706	0.466	-.096	0.923	-.695		-.695	0.474	-.695	0.474
Size	-1.099	0.018	-1.083	0.019	-1.100		-1.100	0.017	-1.100	0.017
Tangibility	.1097	0.938	.444	0.753	.048		.0485	0.973	.048	0.973
Ownership concentration	1.097	0.128	1.073	0.136	1.160		1.160	0.111	1.160	0.111
Growth opportunity: Sales Growth										
m1	6.86	0.000	6.63	0.000	6.70	0.000	6.70	0.000	6.70	0.000
m2	-1.29	0.195	-1.13	0.258	-1.27	0.203	-1.27	0.203	-1.27	0.203
Sargan test	238.05	0.003	234.74	0.005	235.21	0.004	235.21	0.004	235.20	0.004

Notes: (*), (**) and (***) indicates that coefficients are significant at 10, 5 and 1 percent level, respectively. The test m2 is second order autocorrelation of residuals under the null of no serial correlation. Sargan test is test of the overidentifying restrictions, under the null of instruments' validity.

Tables 3 and 4 show the GMM results of the effect of diversification on Roa for the whole sample (table 3) and the listed sample (table 4). In general the results suggest that more diversified firms tend to have lower profitability or, equivalently, that more focus on the core business raises profitability. A non-monotonic relation seems to be significant, showing a counterbalancing effect between the benefits and costs of diversification. According to Markides (1992) and Grant, Jammine and Thomas (1988), our findings show that there is an optimal level of diversification. It is a surprise the direction of this non-monotonic relation; it is negative at the beginning and positive afterwards. The U-shape relation between diversification and performance, compared to the inverted U-shape theoretically and empirically known, seems to be quite hard to justify. In Italy, contrary to conventional wisdom, firm value first decreases and, after a certain breakpoint, the increases the level of diversification rises. This results seems to be associated to the negative effect of the related diversification and to the positive effect of unrelated diversification on the performance. Regarding the effect of diversification on a market-based measure of performance (table 4) notice the lack of a statistical significant effect of the diversification *tout court*. Instead it is showed the negative effect of relatedness on the annual stock and the positive influence of unrelated diversification on the firm's market performance. Instead, looking to the effect of diversification on the market-to-book ratio (table 5) it rises the common-known non-monotonic relation positive for low level of total diversification and then negative after a certain threshold. In this case the effect of relatedness on performance is not significant.

In general, it seems to be persistent the negative impact of relatedness on firm's value. The negative effect of relatedness on firm's performance is a surprising result, that seems to be quite far from the common evidence presented in the literature. However, there are some possible justification already presented in literature that can be applied.

Markides and Williamson (1995) suggest the concurrently needs of requirement of a strategy of related diversification to be value-enhancing. The relatedness needs to be based on the resource sharing and skills transferring in related businesses. To be beneficial the resource sharing and skills transferring have to be based on rare, not-imitable, valuable and not-substitutable resources. The lack of one of this properties can generate inefficiency and costs. These results can be interpreted also according to Nayyar (1992), that suggested that relatedness can fail to create value when among the involved business units lack cooperation; problems of communication, of incentives or inefficiency in the allocation of joint costs generate impediments to relatedness exploitation. An justification of the negative relation between related diversification and performance can be found according to a transaction costs perspective (Jones and Hill 1988 and Williamson 1985). Inefficient intrafirm exchanges, coordination and agency costs among the business units, jointly with incentive distortions generated by intrafirm competition (rather than the necessary cooperation among the managers) represents obstacles to performance and outweighs the benefits of relatedness (Goold and Campbell 1998). Decisions of the Italian firms to realize related diversification can be motivated by opportunistic behaviours instead of search of operational synergies.

In general, it is relevant, but with a minor magnitude, the positive effect of the unrelated diversification. The context seems to provide a relevant factor which influence the relation between diversification and value. The positive effect of unrelated diversification can be justified by the role of the internal capital market. Matsasuka and Nanda (1997) and Khanna and Palepu (1997) suggest that the benefits provided by diversification strategies, arising from internal capital market, can be even greater in the presence of significant external capital market constraint and imperfections. Consistent with this view Khanna and Palepu (2000) found little evidence of diversification discount in emerging countries, where external capital market constraint and imperfections are plentiful. In Italy, a typical bank-based financial system country, due to problems of asymmetric information and lack of transparency and disclosure (Guiso et al 2006) inefficiency in the external financial market rises a beneficial role of the internal capital market in providing easily access to financial resources. The positive effect of unrelated diversification can also be motivated by the

coinsurance effect and the seek of tax benefits (Lewellen 1971). Consistent with this argument, several studies (Kim and McConnell 1977, Bergh 1997 and Alonso 2003) have found that the coinsurance effect is one of the most important value-increasing sources associated with unrelated diversification. Firms that follow unrelated diversification can issue more debt and benefit from the fiscal advantages related to debt financing (Bergh 1997). The tax liability of the diversified firm may be less than the cumulated tax liabilities of the different (single) business units. In Italy the tax rate is very high and, as a consequence, firms try to reduce the fiscal costs by conglomerate. Moreover, it is true that the unrelated diversification has a positive effect on firm's performance, but in robustness test, not presented, it is statistically significant a non-monotonic effect in which, at the beginning, the unrelatedness negatively affect firm's performance; after a certain breakpoint this effect became positive. Therefore, this can justify a non-monotonic U-shape relation between the total diversification and the firm's performance.

5. Conclusions

The relation between corporate diversification and firm's value reflects many insights and conversely several unanswered questions; the results of this analysis showed that this relation appears to be puzzling regarding the effect of relatedness. This work provides insight on the debate about the relative performance contribution of related versus unrelated diversification. The research conducted to explain the effects of diversification on firm value has driven to a mainly curvilinear relation between diversification and the value of a firm.

An important issue arises from the results, according to what suggested also by Palich et al (2000), concern that related diversified firms may not be able to exploit fully the relatedness designed into the portfolio businesses. On this regards, Markides and Williamson (1994) suggested a "mirage effect" or an "exaggerated relatedness effect" when assessing apparent similarity between businesses units that, instead, did not provide any benefits of the expected operational synergies. In Italy it seems that diversified firms in related businesses were not able to create value; they realized related diversification without exploiting relatedness benefits. Relatedness seems do not provide a superior competitive advantage compared to competitors.

Furthermore, unrelated strategies may present some unique advantages based on financial synergies, that outperform the effect of related diversified strategies.

Inefficiency in the external capital market, that characterize the Italian capital market, can financially constraint Italian firms. As a consequence, conglomerates provide financial support to substain the corporate growth. The coinsurance effect and the tax benefit can also justify the positive effect of unrelated diversification on corporate value.

Therefore, the general puzzling superiority of the related strategy on unrelated one did not resulted in Italy. It seems that country-specific factors, associated to inefficiency in the capital market, generate superior benefits from an internal capital market. And so the direction of future research, based on cross-country analysis seems to be promising in enlightening the controversial link between diversification and performance.

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