

Value creation and business performance: an empirical analysis in the manufacturing sector.

Domenico SUMMO, Tommaso PEPE

Dipartimento di Scienze Statistiche – Università degli Studi di Bari

Via Camillo Rosalba, 53 Bari – dosummo@dss.uniba.it

Abstract: The purpose of the current essay is to analyze a firm's business performance through value creation, thus increasing its market value. To capture both income and financial firm's performance we built an index based on distance measures. According to the index value obtained for every firm included in our sample and through the comparison with the average industry performance, we introduced a logit model to evaluate the probability the firm has to reach an optimum in terms of value creation levels.

Keywords: business performance, value creation, economic growth.

1. Value creation and business performance

Quantifying value creation represents one of the most important issue for entrepreneurs, managers, financial advisors and business consultants.

Value creation and growth are strictly related to each other and are of strategic importance for a firm to assess its global performance over a fixed time frame.

The main factors affecting the growth of a firm are: industry and market development, firm's competitive advantage and external growth through mergers and/or acquisitions. We think it may be reductive to associate the growth to a single factor as all of them have the same importance and they are strictly related to each other.

The necessity to empirically measure the contribution of the firm's strategies in the value creation leads to the implementation of different calculation techniques. These can be used within the resource allocation process and to find the real causes of value creation.

Within this scope, financial statement analysis has proved to be of effective support in comparing a firm with its competitors, thus evaluating its strategic positioning in the industry it operates in.

2. The set of variables

The key issue in value creation consists in its quantitative evaluation. Economic studies have always considered a firm's final income as a good proxy for value creation and growth. Besides, financial information should also be taken into account, especially with respect to intangible assets have proved to be of strategic importance for business performance.

To evaluate a firm's value creation we take into account both its income and financial dimensions. Indexes on financial dimension include: $\Delta AFN_t / AFN_{t-1}$ (where AFN

represents net fixed assets); $\Delta PN_t/PN_{t-1}$ (where PN represents net assets). Indexes on income dimension include: ROE_t ; ROI_t ; ROS_t ; invested capital turnover; $R\&D_t/FATT_t$ (where R&D are the research & development expenditures and FATT are the sales); $VA_t/FATT_t$ (where VA is the valued added).

In addition we considered the EVA *Economic Value Added*, a mixed income-financial index: it is a measure of the superiority of the return a company is able to realize on invested capital above the baseline return expected by the investment community.

3. Methods and empirical application

The empirical analysis is based on financial statements of manufacturing firms belonging to the mechanics industry. These firms are located in Puglia and their turnover exceeds 5 million euros in the period ranging from 2004 to 2007. The data set of 191 firms has been drawn from the data base of AIDA.

After a first descriptive analysis of firms' financial statement ratios, we evaluated the market positioning for each firm through an index aimed at capturing both its financial and income dimension.

The index (I_{ij}) is the following:

$$I_{ij} = \sqrt{\frac{1}{p} \left[\sum_{k=1}^p \frac{(x_{ij,k} - x_{j,\min k})^2}{(x_{j,\max k} - x_{j,\min k})^2} \right]} \quad (1)$$

where:

$x_{ij,k}$ is the k -th financial statement ratio of firm i and industry j ,

$x_{j,\min k}$ is the lowest value of the ratio k ,

$x_{j,\max k}$ is the highest value of the ratio k ¹.

At the same time we built a similar index I_j for the mechanics industry overall aimed at evaluating its performance with respect to others included in the manufacturing division (section C Ateco).

The deviation of industry index from the firm index captures the performance of the firm with respect to average performance of the industry it operates in.

In order to assess the probability the firm has to reach optimal levels ($p=1$) in terms of value creation and growth we adopted a *logit* model.

The model is the result of the sum between the firm index (I_{ij}) and the deviation ($I_{ij} - I_j$). In case of a positive deviation the model highlights the good performance of each firm compared to the average industry performance; in this case, the firms are a high probability ($p>0,75$) to reach optimal level in terms of value creation with respect to

¹The dividend summarizes (for each elementary ratio) the Euclidean distance between the value calculated for the i -firm and the value calculated for the "worst" firm; this difference is compared to the Euclidean distance between the best and the worst value for each ratio (that is the range of variation in statistics). The ratio ranges from 0 (the i -firm has the lowest performance with respect to the ratio k) to 1 (the firm achieves the best performance with respect to the ratio k).

Alternatively, the index represents the average of all ratios for the i -firm.

industry average performance. In case of negative deviation the firm has a lower probability ($p \leq 0,45$).

This can be mathematically expressed by:

$$Prob(Y_{ij} = 1 | I_{ij}, I_j) = \frac{e^{I_{ij} + (I_{ij} - I_j)}}{1 + e^{I_{ij} + (I_{ij} - I_j)}} \quad (2)$$

All of the firms included in the sample have been reclassified according into three classes: firms with a low, medium and high income-financial performance.

Based on the results of the model, we observe that the 50% of firms has a high probability to reach optimal level in the period 2004-2007, in contrast with the 45% of firms with a medium probability and only the 5% of firms with a low probability.

More in detail, a little bit more than 11% of firms moved from the low probability class to the medium probability class; the 31% moved from the medium probability class to the high probability class and only the 6% moved from the higher class to the medium.

Table 1 – Percentage distribution of firms according to classes of probability (2004, 2007).

Original classes 2004	Final classes 2007			Total
	Low	Medium	High	
Low ($p \leq 0,45$)	5,00	11,27	-	16,27
Medium ($0,45 < p \leq 0,75$)	-	27,54	31,26	58,80
High ($p > 0,75$)	-	6,21	18,72	24,93
Total	5,00	45,02	49,98	100,00

Source: elaboration on empirical survey (by AIDA).

Given that the 42,53% (11,27% and 31,26%) of firms increased their probability to reach optimum levels of growth, the variables that influenced the phenomenon the most are (in terms of correlation between the k-th index and the firm's performance index I_{ij}): EVA ($R=0,679$), the ROE ($R=0,708$) and the VA/FATT ratio ($R=0,645$).

The analysis of the spatial correlation further proves the low percentage of firms able to reach higher value creation and growth levels.

There's a heterogeneous behaviour within the examined firms. This is underlined by the application of an empirical form of Moran's index and taking into account the null hypothesis of spatial non-correlation.

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