The Performance of Italian Clothing Firms for Shareholders, Workers and Public Administrations: An Econometric Analysis

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This paper presents an econometric analysis of the relationship between different indicators of performance of Italian clothing firms. The focus is on the empirical analysis of the process of value creation of Italian clothing firms for three categories of stakeholders: shareholders, workers, and public administrations. The accounting ratios used in the empirical analysis explain about 40% of inter-firm variability of Return on Equity (ROE), 32% of inter-firm variability of labor cost per employee, and 97% of inter-firm variability of taxation of firms per employee.

Introduction

Both in the prediction of failures and in the analysis of the value of firms, the attention has been traditionally focused upon financial accounting variables. However, Eccles (1991, p. 132) had pointed out that "dissatisfaction with using financial measures to evaluate business performance is nothing new. As far back as 1951, Ralph Cordiner, the CEO of General Electric, had commissioned a high-level task force to identify key corporate performance measures. The categories the task force singled out were timeless and comprehensive: in addition to profitability, the list included market share, productivity, employee attitudes, public responsibility, and the balance between short-term and long-term goals." According to Eccles (p. 132) "... many managers worry that income-based financial figures are better at measuring the consequences of yesterday's decisions than they are at indicating tomorrow's performance ... During the 1980s many executives saw their companies' strong financial records deteriorate because of unnoticed declines in quality or customer satisfaction ..."

Kaplan and Norton (1992) proposed a 'balanced scorecard', i.e., a set of measures that gives top managers a fast but comprehensive view of the business. The balanced scorecard includes financial measures that show the results of actions already taken, and operational measures on customer satisfaction, internal processes, and the organization's innovation and

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improvement activities, that are the drivers of future financial performance. The balanced scorecard provides answers to four basic questions: (1) How do customers see the firm (customer perspective)? (2) What must the firm excel at (internal perspective)? (3) How the firm can continue to improve and create value (innovation and learning perspective)? and (4) How the firm looks to its shareholders (financial perspective)?

Stakeholder theory and corporate social responsibility theory have stressed that the capability of value creation for shareholders is not sufficient for the long-run sustainability of a firm, but it is necessary for the firm to be able to create value for all its stakeholders.

The research here presented, after a brief historical survey on the measurement of financial performance through accounting ratios, focuses upon the empirical analysis of the process of value creation of Italian clothing firms for three categories of stakeholders: shareholders, workers, and public administrations.

Measuring Financial Performance Through Accounting Ratios

The standardization of accounting systems during the 19th century paved the ground for the advent of accounting ratios as the most important analytical instrument for financial statement analysis; the profitability ratios were the first to emerge. In the earlier years the development of ratio analysis was dominated by the credit analysis approach. According to Bhattacharya (2007, p. 3) commercial banks began to subject financial statement to rigorous ratio analysis starting from 1870, and the practice became widespread in the 1890s, when the flow of financial information increased greatly. According to Foulke (1961) and Horrigan (1968), toward the end of the 19th century the practice arose of comparing current assets of an enterprise with its current liabilities, through a 'current ratio' which was to have a more significant and long-lasting impact upon financial statement analysis than any other accounting ratio. In the first decade of the 20th century, the idea emerged that for financial equilibrium the current ratio should be nearly 2, i.e., that the value of current assets should be about twice the value of current liabilities (Lough, 1917).

Smith and Winakor (1930) investigated the role of financial ratios as predictors of financial difficulties. Their results showed that the ratio of net working capital to total capital assets was the best predictor of failure. Their findings were however undermined by the absence of a control group. Fizpatrick (1931 and 1932), including a control group, found three accounting ratios as the best predictors of failure: net profit to net worth, net worth to debt, and net worth to fixed assets. One of the best studies on ratios as predictors of financial difficulties of firms was that of Merwin (1942); according to his results the three best predictors of financial difficulties were net working capital to total assets, net worth to debt, and the current ratio.

Since the credit risk applications of accounting ratios showed that, in addition to the current ratio, the movement of a comprehensive set of ratios would give advance notice to the lenders about financial difficulties, some benchmarks for these ratios began gradually to be put in debt covenants; in particular: earnings/debt related outflows, total debt/earnings, total debt/total assets, and, of course, the current ratio (current assets/current liabilities)

(Smith and Warner, 1979; and Diechev and Skinner, 2002). Lincoln (1925) published 40 different ratios; the proliferation of ratios originated the problem of discerning the most relevant ones. According to Salmi and Martikainen (1994), the number of relevant ratios is in the range 4-7. Beaver *et al*. (2004) used only three ratios for bankruptcy prediction, since many ratios seem to be overlapping.

In 1919, the DuPont Company began to use a triangle of ratios: at the top was the return on investment ratio, and at the two sides of the base were the profit margin and the turnover of total assets (Bliss, 1923). Starting from the 1950s, the British Institute of Management developed in Britain the practice of accounting ratios, in the perspective of managerial control; Return on Investment (ROI) was considered the primary ratio to be analyzed. Soliman (2004) showed that the DuPont analysis of ROI could help to predict future change in return on net operating assets.

The Centre for Interfirm Comparison in the UK began to gather data from participating organizations and published them as a DuPont pyramidal ratio system. At the top is the ROI, at one side various expense and profit ratios, on the other side some assets and liabilities turnover ratios. While in the USA ratio analysis was developed mainly with a credit scoring orientation, in the UK it was developed with a managerial focus. In the USA, the Small Business Administration (SBA) generated much interest in the utility of ratios to monitor and manage small firms.

Horrigan (1965) investigated the statistical nature of accounting ratios, in order to verify the validity of using standard statistical techniques to test their predictive power in credit risk analysis. He considered five groups of ratios: short time liquidity ratios, long-term solvency ratios, capital turnover ratios, profit margin ratios, ROI ratios. Financial ratios seem to be in general, nearly normally distributed, even though they are often positively skewed, when they have a lower limit of zero and an indefinite upper limit. According to Horrigan's results, the usual parametric statistical techniques can then be applied to financial ratios. Horrigan also found that many financial ratios are significantly correlated with each other; this entails the need of caution and parsimony in the selection of ratios. Some financial ratios seem to be significantly correlated over time, since firms tend to maintain stable relative financial ratio positions.

Beaver (1966) extended the analysis performed in the 1940s by Merwin (1942). His results showed that the cash flow to total debt ratio had excellent discriminatory power throughout the five years period preceding failure.[1] Two years later, Beaver (1968a) performed some cross-section and time series analyses; the conclusion (p. 192) was that "investors recognize

[1] "The data exhibit a remarkable degree of consistency among themselves and with previous studies ... the evidence indicates that ratio analysis can be useful in the prediction of failure for at least five years before failure" (Beaver, 1966, p. 102). Beaver (1966, p. 101) pointed out that if ratios are used to detect the financial 'illness' of a firm, it can be detected and cured avoiding failure. On the other hand, if ratios are used by financial institutions to estimate creditworthiness, lines of credit can be severed, increasing the likelihood of failure. The first possibility can decrease and the second one can increase the power of accounting ratios as predictors of failure.

and adjust to the new solvency positions of failing firms ... and that the price changes of the common stocks act as if investors rely upon ratios as a basis for their assessments, and impound the ratio information into the market prices."

The univariate type of empirical analysis adopted by Beaver cannot take into account either statistical relationships between different accounting ratios or compensating effects. To overcome these shortcomings, Altman (1968) carried out a multivariate type of analysis. In particular, starting from 22 accounting ratios, he performed a Multiple Discriminant Analysis (MDA); the result was the famous 'Z-score index' which gives a measure of the probability of failure as a weighted average of five selected ratios: working capital to total assets, retained earnings to total assets, Earnings Before Interest and Tax (EBIT) to total assets, market value of equity to book value of equity, sales to total assets. The empirical analysis was subsequently updated by Altman *et al*. (1977) to the period from 1969 to 1975.

Ohlson (1980), investigated 105 bankrupt firms and 2,058 nonbankrupt firms for the period 1970-1976, applying a methodology of conditional logit analysis to avoid problems associated with some quite restrictive statistical properties of the data required by the MDA.[2] Ohlson's results indicated that three accounting ratios are statistically significant for purposes of assessing the probability of bankruptcy: total liabilities to total assets, as a measure of financial leverage, net income to total assets (or funds provided by operations to total liabilities), as a measure of economic performance, working capital to total assets (or current liabilities to current assets), as a measure of liquidity. Size too is important: the probability of failure decreases when the size of the firm increases. Using a hazard model for the period 1962-2002[3], Beaver *et al*. (2004) found a significant failure explanatory power of three accounting ratios: (1) Return on Assets (ROA), (2) Earnings Before Interest, Taxes, Depreciation and Amortization or EBITDA to total liabilities (ETL), and (3) Total liabilities to total assets (LTA).

Another important field of application of accounting indicators concerns their relationship with the value of firms. The empirical relevance of accounting numbers and of annual earnings announcement for investors in stock markets was examined by Ball and Brown (1968) and Beaver (1968b). The research carried out by Ball and Brown (1968) seems to represent one of the first rigorous application of econometric methodologies to the analysis of the relationship between accounting numbers and market values of firms. Ball and Brown started their investigation by stressing the limitations of the concept of net income: "Because accounting lacks an all-embracing theoretical framework, dissimilarities in practice have evolved. As a consequence, net income is an aggregate of components which are not homogeneous, it is thus alleged to be a 'meaningless' figure, not unlike the difference between twenty-seven tables and eight chairs. Under this view, net income can be defined only as the result of the application of a set of procedures ... to a set of events ... with no other definitive substantive

[2] Since the work of Ohlson (1980), most of the academic literature has used logit models to predict defaults, though the results of Altman's and Ohlson's approach seem to be quite similar in terms of classification accuracy (Altman *et al*., 2008, p. 10).

[3] According to Bhattacharya (2007), hazard models are inspired by living organism, which have finite life along a time path; the cumulative probability of death is an increasing function of time, starting from zero and approaching one over time.

meaning at all" (Ball and Brown, 1968, p. 160)[4]. In their test of the empirical evaluation of accounting numbers, Ball and Brown used as a predictive criterion the investment decisions as they are reflected in security prices[5]. They observed that both incomes of firms and stock prices tend to move together[6], and that industry effects probably account for about 10% of the variability in the level of a firm's income. The statistical analysis performed by using Standard and Poor's Compustat tapes for the period 1946-1966, showed that about one-fourth of the variability in the changes in the median firm's net income can be associated with changes in the market earning per share. The empirical analysis performed by Ball and Brown (1968) considering 261 firms for the period 1957-1965 was most relevant. They elaborated for these firms an abnormal performance index, which traces out the value of one dollar invested in equal amounts in all securities after abstracting from market effects. Their results demonstrated that the information contained in the annual income number is useful in that if actual income differs from expected income, the market typically reacts in the same direction (Ball and Brown, pp. 169-170). They computed results for the regression model using, instead of net income, cash flow, as approximated by operating income, and net income before nonrecurring items, but neither of these two variables was as successful in predicting the signs of the stock return residuals as net income and earnings per share. Ball and Brown (pp. 174-176) pointed out that the information contained in the annual income numbers is useful in that it is related to stock prices[7], but annual accounting reports are only one of the many sources of information available to investors, and it does not rate highly as a timely medium, since most of its content seems to be captured by more prompt media which include interim reports.

Research activity on the relationship between accounting values and valuation analysis was intensified particularly starting from the early 1980s. One of the most prolific author in this field seems to have been James A Ohlson. Freeman *et al*. (1982) performed an empirical investigation on book rates of return and prediction of earning changes. Ohlson (1995) and Felthman and Ohlson (1995)[8] investigated the relationship between earnings, book values and equity valuations, elaborating the "residual income valuation model"[9]. In subsequent years, the relationship between accounting indicators and market values of firms were investigated, among others, by Dechow *et al*. (1999) and Ohlson (2001, 2005 and 2006). Ohlson and

[4] Such a position was sustained by Canning (1929, p. 98): "what is set out as a measure of net income can never be supposed to be a fact in any sense at all except that it is the figure that results when the accountant has finished applying the procedures which he adopts."

[5] Beaver (1968b) investigated the information content of annual earnings announcements using the investment decision, as it is reflected in transactions volume, as a predictive criterion. His results showed that transactions volume increases in connection with annual earnings announcements.

[6] In the period 1944-1960, about half of the variability of an average firm's earnings per share and about one-third of the variability in a stock's monthly rate of return could be associated with economy-wide effects (Ball and Brown, 1968, p. 162).

[7] Of all the information about an individual firm which becomes available during a year, one half or more is captured in that year's income number (Ball and Brown, 1968, p. 176).

[8] Felthman and Ohlson (1995) distinguished financial from operating assets. Since financial assets are assumed to be fairly valued on the balance sheet, abnormal earnings for financial assets are assumed to be zero, so that one can simplify the Felthman-Ohlson model by focusing exclusively on valuing operating assets.

[9] Residual (or abnormal) income (earnings) for year t is equal to earnings (net income) for the period ($t - 1$, t) minus book value at date $t -1$ multiplied by the required rate of return on capital. The value of the firm at time t is defined as the book value at time t plus the discounted future residual (or abnormal) income (earnings). The concept of residual or abnormal income seems to be equivalent to that of Economic Value Added (EVA) notion, proposed by Stewart (1991).

Juettner-Nauroth (2005) proposed the OJ valuation model, which tries to explain a firm's equity value in terms of next year's expected earnings (forward earnings), short-term growth in expected earnings, long-term or asymptotic growth in expected earnings, and the discount factor or the cost of equity capital.

A Descriptive Analysis of Some Performance Indicators of Italian Clothing Firms

Indicators of performance of Italian clothing firms have been obtained on the basis of the financial statements available in AIDA, a data bank including financial data of about 500.000 firms operating in Italy. In particular, the following data have been used for each firm: total sales, total labor costs, EBITDA[10], EBIT, value added, Earnings Before Tax (EBT), net earnings (earnings net of tax), number of employees, ROA, given by the ratio of EBIT to total assets, sales per employee, value added per employee, labor cost per employee, sales/labor cost, and equities/net immobilized assets (tangible, intangible and financial). Some descriptive statistics (median value, weighted mean value, simple (unweighted) mean value, simple/weighted mean value, standard deviation, standard deviation/simple mean) of several indicators of performance of Italian clothing firms are illustrated in Table 1.

The values of two indicators of performance often employed in the analysis of companies, EBITDA[11] and EBIT, as a percentage of sales revenue are reported in the first two rows of Table 1. EBITDA for the Italian clothing firms has a weighted mean value of 10.44% and a simple mean value of 7.44%, with a standard deviation equal to its mean value. EBIT has a weighted mean value of 7.60% and a simple mean value of 5.11%, with a standard deviation equal to 1.43 times its mean value. From the theoretical viewpoint, EBIT is a better measure of performance, since it takes into account the depreciation of fixed assets. In practice, however, the estimation of depreciation involves a considerable amount of discretional choices[12], so that EBIT is a much more subjective measure of performance than EBITDA[13].

[10] Depreciation is an accounting estimate to take account of the diminution in value of a fixed asset and to spread its cost over its estimated useful life, while amortization refers to the writing off of an intangible asset over a period (Tennent, 2008, pp. 294 & 296).

[11] According to Tennent (2008, p. 211), EBITDA is a relatively new measure of profit that has become popular because it is a good indicator of the cash generated by the business; depreciation and amortization are not subtracted since they are a book entry to reflect the usage of fixed assets rather than a cash cost.

[12] According to the accounting principle of matching, the costs of fixed assets, such as a piece of plant or equipment, are to be recognized over their useful life. Depreciation is the process of spreading the cost of owning an asset over the years in which the firm benefits from its use. The estimate of each year's depreciation charge is based upon the estimation of the original cost of the asset, its useful life, its potential residual value and/or dismissal cost, the method of spreading the cost of the asset over its useful life. Particularly difficult is to get a correct estimate of the useful life of some assets, since one has to take into account not only physical duration but obsolescence as well. Four methods are mainly used to spread the cost of an asset over its estimated useful life: the straight line method allocates the cost of the asset equally over the years; the reducing balance and sum of digits methods lead to decreasing depreciation charges over the years; and the unit of extraction method involves depreciation charges in proportion to the revenue that the asset has helped to generate in each year.

[13] "The financial statements, on which the ratios can be applied, are compiled in accordance with legal requirements and guidelines from accounting bodies. However, there is still room for judgement; for example, the depreciation policy for machinery may be to write off an asset over eight years in one company and ten years in another" (Tennent, 2008, p. 210).

In the DuPont hierarchy pyramid of ratios, the product of the operating profit margin (EBIT/revenue) and the asset turnover (revenue/total assets) gives the rate of return on total assets (ROA). The asset turnover in Italian clothing firms has a weighted mean value of 1.10% and a simple mean value of 1.35%, with a standard deviation equal to 0.5 times its mean value. The fourth row of Table 1 shows that EBIT as a percentage of total assets (ROA), of Italian clothing firms has a weighted mean value of 8.34% and a simple mean value of 6.9%, with a standard deviation equal to 1.22 times its mean value. The values of ROE, the main indicator of a firm's performance from the point of view of its shareholders, are reported in the fifth row of Table 1. For Italian clothing firms, the ROE has a weighted mean value of 10.76% and a simple mean value of 8.29%, with quite a high standard deviation (3.42 times its mean value).

Table 1: Some Descriptive Statistics of Several Indicators of Performance of 2,079 Italian Clothing Firms in 2007

	Median Value	Weighted Mean Value	Simple Mean Value	Simple/ Weighted Mean Value	Standard Deviation	Standard Deviation/ Simple Mean
EBITDA as a % of sales revenue	6.33	10.44	7.44	0.71	7.55	1.02
EBIT as a % of sales revenue (Operating Profit Margin)	4.45	7.60	5.11	0.67	7.30	1.43
Asset Turnover (sales revenue/total assets)	1.26	1.10	1.35	1.23	0.67	0.50
EBIT as a % of total assets (ROA)	5.45	8.34	6.90	0.83	8.44	1.22
Net earnings as a % of shareholders' funds (ROE)	6.04	10.76	8.29	0.77	28.30	3.42
Depreciation and amortization as a % of EBITDA	23.22	27.24	20.31	0.75	306.45	15.09
Depreciation and amortization as a % of fixed assets	16.71	11.82	27.37	2.32	241.99	1.36
Financial and extraordinary expenses as % of EBITDA	20.84	10.39	9.27	0.89	834.28	90.03
Taxation of firms as a % of EBT	56.03	46.90	157.17	3.35	4,377.49	27.85
Taxation of firms per employee[#]	3.48	6.02	9.56	1.59	50.97	5.33
Shareholders' funds as a % of total assets	17.80	35.27	23.67	0.64	18.02	0.80

Table 1 (Cont.)

	Median Value	Weighted Mean Value	Simple Mean Value	Simple/ Weighted Mean Value	Standard Deviation	Standard Deviation/ Simple Mean
Shareholders' funds as a % of fixed assets	124.95	133.55	133.55	1.00	13,423.1	100.51
No. of employees	19.00	76.47	76.45	1.00	560.17	7.33
Total assets per employee#	190.41	179.74	331.47	1.84	810.79	2.45
Net fixed assets per employee#	21.72	47.47	74.16	1.56	519.21	7.00
Shareholders' funds per employee#	32.37	63.40	79.94	1.26	254.88	3.19
Sales revenue per employee#	223,73	197,26	366,61	1,86	589,46	1,61
Value added per employee#	43.17	45.88	64.69	1.41	232.35	3.59
Labor cost per employee#	27.59	24.51	30.64	1.25	18.56	0.61
Labor cost as a % of value added	66.55	53.42	71.21	1.33	94.46	1.33
Note: # Values in thousand euro.						
Source: Own Elaborations of AIDA Financial Reports						

In order to deepen the analysis of the relationship between EBITDA and EBIT, some measures are reported in the sixth and seventh rows of Table 1. Depreciation and amortization as a percentage of EBITDA and of fixed assets have a mean value[14] of 20% and 27%, and a standard deviation of 15.09 and 1.36 times their mean value, respectively. Since depreciation and amortization values depend partly upon subjective judgments of accountants, the high variability of these values between firms as a percentage of both EBITDA and fixed assets could give rise to some doubts about the reliability of the EBIT estimates, which depend substantially upon depreciation and amortization values.

Financial and extraordinary expenses as a percentage of EBITDA have a mean value of 9.27%, with a very high standard deviation of 90.03 times its mean value. Taxation is the contribution of firms to public administrations, and hence, indirectly, to the community. For Italian clothing firms, taxation as a percentage of Earnings Before Taxes (EBT) has a weighted mean value of 46.9%, while taxation per employee has a weighted mean value of €6,020 and a simple mean value of €9,560, with a standard deviation equal to 5.33 times its mean value. An indicator of performance from the point of view of the employees of the firm is labor cost per employee; this for Italian clothing firms has a weighted mean value of €24,510 and a simple mean value of €30,640, with a rather small standard deviation (0.61 times its mean value).

[14] Unless otherwise specified, the mean value is the simple (unweighted) mean.

An Econometric Analysis of Different Indicators of Performance of Italian Clothing Firms

For some particularly relevant performance indicators, a multivariate econometric analysis has been performed. The results are reported in Tables 2 to 6.

Table 2 reports the results of the econometric analysis of the relationship between value added per employee and different indicators of performance of Italian clothing firms. The model explains nearly 97% of the variability of value added per employee. The coefficients of taxation of firms per employee, total assets per employee, and labor cost per employee are significantly greater than zero with *p*-value smaller than 0.001. The coefficients of ROA, shareholders' funds as a percentage of total assets, net fixed assets per employee, sales revenue per employee, and labor costs as a percentage of value added are significantly negative with *p*-value smaller than 0.001.

Table 3 reports the results of the econometric analysis of the relationship between EBIT as a percentage of total assets (ROA) and different indicators of performance of Italian clothing firms. The predictors explain 76% of the variability of ROA. The coefficients of ROS, ROE, taxation of firms per employee, shareholders' funds as a percentage of total assets, net fixed assets per employee, sales revenue per employee, and labor cost as a percentage of value added are significantly greater than zero with *p*-value smaller than 0.001. The coefficients of EBITDA as a percentage of sales revenue, total assets per employee, and value added per employee are significantly smaller than zero with *p*-value smaller than 0.001.

Table 4 reports the results of the econometric analysis of the relationship between after tax profits as a percentage of shareholders' funds (ROE) and different indicators of performance of Italian clothing firms. The predictors explain 40% of the variability of ROE. The coefficients of ROA and taxation of firms as a percentage of EBT are significantly greater than zero with *p*-value smaller than 0.001. The coefficient of labor costs as a percentage of value added is significantly smaller than zero with a *p*-value smaller than 0.001.

Table 5 reports the results of the econometric analysis of the relationship between labor cost per employee and different indicators of performance of Italian clothing firms. The predictors explain 32% of the variability of labor cost per employee. The coefficients of net fixed assets per employee, sales revenue per employee, value added per employee, labor costs as a percentage of value added, and total value added are significantly greater than zero with a *p*-value smaller than 0.001. The coefficients of taxation of firms per employee, the number of employees, and total assets per employee, are significantly negative with *p*-value smaller than 0.001.

Table 6 reports the results of the econometric analysis of the relationship between taxation of firms per employee and different indicators of performance of Italian clothing firms. The predictors explain 97% of the variability of taxes paid by firms per employee. The coefficients of ROA, net fixed assets per employee, shareholders' funds per employee, sales revenue per employee, value added per employee, and labor costs as a percentage of value added are significantly greater than zero with *p*-value smaller than 0.001. The coefficients of depreciation

Table 2: Econometric Analysis of the Relationship Between Value Added Per Employee and Different Indicators of Performance of Italian Clothing Firms				
Dependent Variable: Value Added Per Employee				
Included Observations: 2,079				
Variables	**Coefficient**	**Std. Error**	***t*-Statistic**	***p*-Value**
Constant	15.977	3.326	4.803	0.000
EBITDA as a % of sales revenue	0.856	0.350	2.444	0.015
EBIT as a % of sales revenue (ROS)	–0.494	0.421	–1.172	0.241
Sales revenue/total assets	–1.235	1.377	–0.897	0.370
EBIT as a % of total assets (ROA)	–0.915	0.221	–4.134	0.0000
After-tax profit as a % of shareholders' funds (ROE)	–0.020	0.042	–0.472	0.637
Depreciation as a % of EBITDA	0.006	0.003	1.882	0.060
Depreciation as a % of fixed assets	0.010	0.004	2.719	0,007
Financial and extraordinary expenses as a % of EBITDA	–0.003	0.001	–2.283	0.023
Taxation of firms as a % of EBT	–0.001	0.000	–0.467	0.641
Taxation of firms per employee#	4.443	0.035	127.82	0.000
Shareholders' funds as a % of total assets	–0.291	0.062	–4.723	0.000
Shareholders' funds as a % of fixed assets	0.000	0.001	–2.680	0.007
No. of employees	0.005	0.004	1.301	0.194
Total assets per employee#	0.118	0.005	22.061	0.0000
Net fixed assets per employee#	–0.126	0.006	–21.966	0.0000
Shareholders' funds per employee#	–0.012	0.008	–1.486	0.137
Sales revenue per employee#	–0.116	0.004	–32.286	0.000
Labor cost per employee#	1.177	0.054	21.886	0.000
Labor cost as a % of value added	–0.072	0.011	–6.723	0.000
Total value added (€ mn)	–0.152	0.116	–1.314	0.189
R^2	0.968			
Adjusted R^2	0.968			
F-Statistics	3141			
Prob.(*F*-Statistics)	0.000			
Akaike Information Criterion	10.303			
Schwarz Information Criterion	10.360			
JB-Statistics	489955			
Prob. (JB-Statistics)	0.000			
Note: # Value of variables in thousand euro.				
Source: Own Elaborations on Data Taken from AIDA Data Bank				

Table 3: Econometric Analysis of the Relationship Between EBIT as a Percentage of Total Assets (ROA) and Different Indicators of Performance of Italian Clothing Firms				
Dependent Variable: EBIT as a Percentage of Total Assets (ROA)				
Included Observations: 2,079				
Variables	**Coefficient**	**Std. Error**	***t*-Statistic**	***p*-Value**
Constant	1.705	0.330	5.174	0.000
EBITDA as a % of sales revenue	–0.173	0.035	–5.010	0.000
EBIT as a % of sales revenue (ROS)	0.924	0.037	25.307	0.000
Sales revenue/total assets	–0.114	0.137	–0.834	0.405
After-tax profit as a % of shareholders' funds (ROE)	0.075	0.004	19.749	0.000
Depreciation as a % of EBITDA	–0.001	0.000	–1.698	0.090
Depreciation as a % of fixed assets	–0.007	0.000	–0.189	0.850
Financial and extraordinary expenses as a % of EBITDA	0.000	0.000	1.638	0.102
Taxation of firms as a % of EBT	0.000	0.000	1.061	0.289
Taxation of firms per employee#	0.072	0.010	7.070	0.0000
Shareholders' funds as a % of total assets	0.035	0.006	5.720	0.0000
Shareholders' funds as a % of fixed assets	0.000	0.000	–0.172	0.863
No. of employees	–0.001	0.000	–1.697	0.090
Total assets per employee#	–0.007	0,001	–12.231	0.000
Net fixed assets per employee#	0.006	0.001	10.469	0.000
Shareholders' funds per employee#	0.000	0.001	0.094	0.925
Sales revenue per employee#	0.004	0.000	8.288	0.000
Value added per employee#	–0.009	0.002	–4.134	0.000
Labor cost per employee#	0.017	0.006	2.850	0.004
Labor cost as a % of value added	0.005	0.001	5.150	0.000
Total value added (€ mn)	0.018	0.011	1.588	0.113
R^2	0.764			
Adjusted R^2	0.761			
F-Statistics	333			
Prob.(*F*-Statistics)	0.000			
Akaike Information Criterion	5.682			
Schwarz Information Criterion	5.739			
JB-Statistics	15419			
Prob. (JB-Statistcs)	0.000			
Note: # Value of variables in thousand euro.				
Source: Own Elaborations on Data Taken from AIDA Data Bank				

Table 4: Econometric Analysis of the Relationship Between After-Tax Profit as a Percentage of Shareholders' Funds (ROE) and Different Indicators of Performance of Italian Clothing Firms

Dependent Variable: After-Tax Profit as a Percentage of Shareholders' Funds (ROE)

Included Observations: 2,079

Variables	Coefficient	Std. Error	*t*-Statistic	*p*-Value
Constant	–2.106	1.767	–1.192	0.233
EBITDA as a % of sales revenue	–0.377	0.185	–2.035	0.042
EBIT as a % of sales revenue (ROS)	0.376	0.223	1.690	0.091
Sales revenue/total assets	0.246	0.728	0.338	0.735
EBIT as a % of total assets (ROA)	2.127	0.108	19.749	0.000
Depreciation as a % of EBITDA	0.000	0.002	–0.169	0.866
Depreciation as a % of fixed assets	0.003	0.002	1.583	0.114
Financial and extraordinary expenses as a % of EBITDA	0.001	0.001	1.149	0.251
Taxation of firms as a % of EBT	0.000	0.000	–3.804	0.000
Taxation of firms per employee#	–0.048	0.055	–0.880	0.380
Shareholders' funds as a % of total assets	–0.100	0.033	–3.061	0.002
Shareholders' funds as a % of fixed assets	0.000	0.000	0.701	0.484
No. of employees	0.001	0.002	0.611	0.541
Total assets per employee#	0.006	0.003	1.755	0.079
Net fixed assets per employee#	–0.001	0.003	–0.267	0.790
Shareholders' funds per employee#	–0.005	0.004	–1.202	0.230
Sales revenue per employee#	0.002	0.002	0.696	0.487
Value added per employee#	–0.005	0.012	–0.472	0.637
Labor cost per employee#	–0.036	0.032	–1.144	0.253
Labor cost as a % of value added	–0.020	0.006	–3.527	0.000
Total value added (€ mn)	–0.055	0.061	–0.893	0.372
R^2	0.403			
Adjusted R^2	0.397			
F-Statistic	69.531			
Prob.(*F*-Statistic)	0.000			
Akaike Information Criterion	9.027			
Schwarz Information Criterion	9.084			
JB-Statistics	7709			
Prob. (JB-Statistics)	0.000			

Note: # Value of variables in thousand euro.

Source: Own Elaborations on Data Taken from AIDA Data Bank

Table 5: Econometric Analysis of the Relationship Between Labor Cost Per Employee and Different Indicators of Performance of Italian Clothing Firms				
Dependent Variable: Labor Cost Per Employee				
Included Observations: 2,079				
Variables	**Coefficient**	**Std. Error**	***t*-Statistic**	***p*-Value**
Constant	17.611	1.172	15.027	0.000
EBITDA as a % of sales revenue	–0.273	0.129	–2.108	0.035
EBIT as a % of sales revenue (ROS)	0.220	0.156	1.415	0.157
Sales revenue/total assets	–0.177	0.508	–0.348	0.730
EBIT as a % of total assets (ROA)	0.233	0.082	2.850	0.004
After–tax profit as a % of shareholders' funds (ROE)	–0.018	0.015	–1.144	0.253
Depreciation as a % of EBITDA	–0.002	0.001	–1.701	0.890
Depreciation as a % of fixed assets	–0.002	0.001	–1.461	0.144
Financial and extraordinary expenses as a % of EBITDA	0.001	0.000	1.780	0.075
Taxation of firms as a % of EBT	0.000	0.000	0.727	0.467
Taxation of firms per employee#	–0.783	0.034	–22.855	0.000
Shareholders' funds as a % of total assets	0.062	0.023	2.693	0.007
Shareholders' funds as a % of fixed assets	0.000	0.000	0.135	0.893
No. of employees	–0.006	0.001	–4.324	0.000
Total assets per employee#	–0.022	0.002	–10.045	0.000
Net fixed assets per employee#	0.025	0.002	11.109	0.000
Shareholders' funds per employee#	0.006	0.003	2.097	0.036
Sales revenue per employee#	0.032	0.001	21.536	0.000
Value added per employee#	0.160	0.007	21.886	0.000
Labor cost as a % of value added	0.020	0.004	5.104	0.000
Total value added (€ mn)	0.172	0.043	4.053	0.000
R^2	0.322			
Adjusted R^2	0.316			
F-Statistic	48.927			
Prob.(*F*-Statistic)	0.000			
Akaike Information Criterion	8.101			
Schwarz Information Criterion	8.367			
JB-Statistics	715,467			
Prob. (JB-Statistics)	0.000			
Note: # Value of variables in thousand euro.				
Source: Own Elaborations on Data Taken from AIDA Data Bank				

Table 6: Econometric Analysis of the Relationship Between Taxes Paid by Firms Per Employee and Different Indicators of Performance of Italian Clothing Firms				
Dependent Variable: Taxation of Firms Per Employee				
Included Observations: 2,079				
Variables	**Coefficient**	**Std. Error**	***t*-Statistic**	***p*-Value**
Constant	–4.820	0.701	–6.871	0.000
EBITDA as a % of sales revenue	–0.030	0.074	–0.408	0.683
EBIT as a % of sales revenue (ROS)	0.015	0.089	0.171	0.864
Sales revenue/total assets	0.191	0.292	0.653	0.514
EBIT as a % of total assets (ROA)	0.329	0.047	7.070	0.000
After-tax profit as a % of shareholders' funds (ROE)	–0.008	0.009	–0.880	0.379
Depreciation as a % of EBITDA	–0.001	0.001	–1.712	0.870
Depreciation as a % of fixed assets	–0.003	0.001	–3.645	0.000
Financial and extraordinary expenses as a % of EBITDA	0.000	0.000	1.776	0.076
Taxation of firms as a % of EBT	0.000	0.000	0.519	0.604
Shareholders' funds as a % of total assets	0.040	0.013	3.059	0.002
Shareholders' funds as a % of fixed assets	0.000	0.000	3.025	0.003
No. of employees	–0.001	0.001	–1.186	0.236
Total assets per employee#	–0.016	0.001	–12.851	0.000
Net fixed assets per employee#	0.016	0.001	11.846	0.000
Shareholders' funds per employee#	0.007	0.002	4.012	0.000
Sales revenue per employee#	0.023	0.001	29.164	0.000
Value added per employee#	0.200	0.002	127.82	0.000
Labor cost per employee	–0.259	0.011	–22.855	0.000
Labor cost as a % of value added	0.017	0.002	7.396	0.000
Total value added (€ mn)	0.031	0.025	1.251	0.211
R^2	0.970			
Adjusted R^2	0.970			
F-Statistic	3367			
Prob.(*F*-Statistic)	0.000			
Akaike Information Criterion	7.202			
Schwarz Information Criterion	7.259			
JB-Statistics	337,683			
Prob. (JB-Statistics)	0.000			
Note: # Value of variables in thousand euro.				
Source: Own Elaborations on Data Taken from AIDA Data Bank				

as a percentage of fixed assets, total assets per employee, and labor cost per employee, are significantly negative with *p*-value smaller than 0.001.

Conclusion

Financial ratio analyses performed over many decades have concluded that a few accounting ratios are good predictors of firms' failure. The *Z*-score index obtained from the MDA performed by Altman (1968) focused the attention upon five accounting ratios for assessing the probability of failure: (1) Working capital to total assets, (2) Retained earnings to total assets, (3) EBIT to total assets, (4) Market value of equity to book value of equity, and (5) Sales to total assets. With the advent of the methodology of conditional logit analysis by Ohlson (1980), only three accounting ratios seem to be important for the purpose of assessing the probability of bankruptcy: (1) Total liabilities to total assets, as a measure of financial leverage, (2) Net income to total assets (or funds provided by operations to total liabilities), as a measure of economic performance, and (3) Working capital to total assets (or current liabilities to current assets), as a measure of liquidity. Size also seems to be important, since the probability of failure decreases when the size of the firm increases. Further, three accounting ratios seem to be sufficient for predicting failures when adopting the hazard model used by Beaver *et al*. (2004): (1) ROA, (2) EBITDA to total liabilities (ETL), and (3) Total liabilities to total assets (LTA).

In the valuation models developed starting with Ohlson (1995), the value of a share seems to depend upon the book value per share, the residual or abnormal future earnings per share, and the cost of equity capital.

In this paper, the focus of the empirical research has been upon the empirical analysis of some indicators of performance of Italian clothing firms from the point of view of three categories of stakeholders: shareholders, workers, and public administrations. The results show that financial indicators can explain about 97% of inter-firm variability of value added per employee, 76% of inter-firm variability of ROA, 40% of inter-firm variability of ROE, 32% of inter-firm variability of labor cost per employee, and 97% of inter-firm variability of taxation of firms per employee. ■

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Reference # 09J-2011-01-02-01