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Social Report and Stock Price. An empirical analysis

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Abstract

We test whether the publication of a social report influences, directly and indirectly, the stock price. The research model used is based on the classic formulation of value relevance analysis and the sample selected consists of 178 Italian listed companies. The estimates demonstrate a significant negative correlation between the publication of a social report and the stock price. Furthermore, all other factors being equal, accounting information on book value per share and earning per share are more relevant in the stock price formation process in the case of companies that publish a social report.

1 – Introduction

Although Corporate Social Responsibility (CSR) is by no means a new topic in management and accountability studies, it has attracted particular attention from researchers and company managements in recent years.

One of the reasons for its renewed importance is the serious financial and behavioural scandals which have involved some large multinationals. In some cases, while declaring their social commitment in advertising campaigns and initiatives aimed at the community, companies have actually acted in a way that conflicts with the classic principles of CSR.

In our opinion, this non-compliant behaviour may be partly amplified by the absence of a CSR reporting obligation. In practice, social and ethical reporting is voluntary, and unlike financial accounting is not intended to provide detailed information content. This social reporting method therefore may not have the binding value that would enable CSR to become a discriminating factor in the choice of stock market traders.

On the basis of this last factor, we decided to analyse the situation of Italian listed companies to establish whether the stock price formation process is influenced by the publication of a CSR report.

The results do not provide an unequivocal answer. The publication of a social and ethical report in itself seems to have an unfavourable effect on the stock price. However, estimates indicate a negative correlation between the publication of the social report and the stock price. The study also demonstrates a significant positive correlation between Book Value per Share (BPS) and stock price and between Earnings per Share (EPS) and stock price, and a positive correlation between the interaction of BPS and publication of the social report with the stock price. Finally, we found a positive but not significant correlation between the stock price and the interaction EPS - publication of the social report.

The rest of the paper is organised as follows. Section two contains a brief analysis of the research conducted on CSR and the applications of value-relevance. Section three develops testable research hypotheses. Section four shows the methodology (research model, sample selection and data). Section five discusses the empirical results (descriptive statistics and regression analysis). Finally, the concluding section reveals the paper's limitations and provides suggestions for future research.

2 – Literature Review

Many researchers have conducted empirical studies of CSR over the years, through the use of various statistical analysis methodologies, to examine the nature of the relationship between Corporate Social Performance and Corporate Economic Performance (Spicer, 1978), (Aupperle et al., 1985), (Ullmann, 1985), (Margolis & Walsh, 2001), (De Bakker et al., 2005), (Barnett, 2007), or the link between Corporate Social Performance and Corporate Financial Performance (McGuire et al., 1988), (Cochran & Wood, 1984), (Griffin & Mahon, 1997), (Waddock & Graves, 1997), (Richardson et al., 1999), (McWilliams & Siegel, 2000), (Roberts & Dowling, 2002), (Orlitzky et al., 2003).

However, as already stated, the purpose of this paper is to investigate whether stock prices are influenced by the publication of a social and ethical report, and we consider that the most suitable analysis methodology for this purpose is value-relevance.

The concept of relevant value is not new in the literature but the use of the term "value-relevance" is relatively recent (Amir et al., 1993). The best-known conceptual model of value-relevance analysis is the one proposed by Ohlson (Ohlson, 1995), which has been used by various researchers over the years.

There are numerous applications of value-relevance to individual variables of strict accounting derivation (Biddle et al., 1997), (Collins et al., 1997), (Barth et al., 2001), (Hung, 2000),

(Brown & Sivakumar, 2003), and to other items of non-financial information (Amir et al., 1996), (Lev & Sougiannis, 1996), (Hirschey et al., 2001).

In particular, some interesting applications of value-relevance to non-financial variables are proposed by Sinkin (Sinkin et al. 2008) and Hassel (Hassel et al. 2005), among others. The two studies take into account eco-efficient business strategy and environmental variable, respectively. Hence they provide some important points to consider for our research.

However, the environmental variable is just one of the many dimensions into which corporate social and ethical reporting, which forms the subject of our investigation, is divided (Belkaoui, 1999), (Carroll, 1999).

Analysis of earlier studies did not enable us to identify a consolidated scientific background and/or empirical analyses conducted on the lines of our research. In fact, to the best of our knowledge, no studies have investigated the value-relevance of disclosure of CSR reports.

3 – Research Proposition

The purpose of our research is to identify the relevance of publication of a company's social report to the stock price formation process. The aim is therefore to establish whether the price at which an investor is willing to buy the stock is influenced by the publication of the social report.

In our opinion, the publication of a social report may impact at two levels: either directly, by acting as a relevant variable, or indirectly, by interacting with the other accounting variables which form the basis of the model, and modifying the significance of book value and earnings.

Our study was consequently designed to verify two hypotheses:

H1: that the publication of a social report directly influences the stock price because it is perceived by investors as a variable that explains the stock value;

H2: that the publication of a social report indirectly influences the stock price because it is perceived by investors as a factor that modifies the relevance of the other accounting variables that explain the stock price.

4 – Methodology

Research model

In order to assess the impact of publication of a social report we considered the value-relevance analysis. The classic model can be expressed as follows:

$$P_{itq} = \beta_0 + \beta_1 BPS_{itq} + \beta_2 EPS_{itq} + u_{itq} \qquad [1]$$

where:

P_{itq} market value, or stock price, of firm i at year t, quarter q;
BPS_{itq} book value per share of firm i at year t, quarter q;
EPS_{itq} earnings per share of firm i at year t, quarter q;
u_{itq} error term;
i 1,…,178 firms in our sample;
t 2002,…,2008 years observation;
q 1,...,4 quarters observation for each year;
β_0 intercept;
β_1 β_2 parameter estimates that relate BPS and EPS to the market value of the firm.

The value-relevance analysis assumes that other information is value-relevant if it provides information associated with the market value of the firm. As we wished to test whether publication of the social report influences the market price, we modified the expression [1].

We included in the model [1] a dummy variable, d_SR, equal to 1 if the company publishes the social report, and 0 if it does not. We also allowed the dummy to interact with the variables BPS and EPS in order to verify whether the publication of a social report could yield differences in the impact of the accounting information (book value and earnings) on the stock price (Wooldridge, 2006). Thus, we considered the following model:

$$P_{itq} = \beta_0 + \delta_0 d\_SR_{itq} + \beta_1 BPS_{itq} + \delta_1 BPS_{itq} * d\_SR_{itq} + \beta_2 EPS_{itq} + \delta_2 EPS_{itq} * d\_SR_{itq} + u_{itq} \quad [2]$$

where:

P_{itq} market value, or stock price, of firm i at year t, quarter q;
d_SR_{itq} dummy variable of firm i at year t, quarter q;
BPS_{itq} book value per share of firm i at year t, quarter q;
EPS_{itq} earnings per share of firm i at year t, quarter q;
u_{itq} error term;
i 1,…,178 firms in our sample;
t 2002,…,2008 years observation;
q 1,...,4 quarters observation for each year;
β_0 intercept;
β_1 β_2 parameter estimates that relate BPS and EPS to the market value of the firm;
δ_1 δ_2 parameter estimates that relate the market value of the firm to the interaction of the dummy variable with BPS and EPS.

The proposed model allows various result levels to be indicated. Firstly, all other factors being equal, we can establish the difference in stock price, equal to δ_0, associated solely with the publication of the social report. Moreover, the differential in the impact of the book value per share and earnings per share on the stock price could be δ_1 and δ_2 respectively for companies which publish a social report compared with those which do not. In addition, we tested whether the coefficients of the dummy and the interaction variables are jointly significant: if this is the case, then we can conclude that there is a significant difference in the value-relevance model between the group of companies which publish their social report and the group of companies which do not.

Sample selection

The reference sample consisted of all the Italian companies listed on the Milan Stock Exchange in the period 2002-2008[1]. The panel was set up by including only companies which were always listed during the reference period; companies which were suspended from listing for various reasons were therefore excluded. The sample consisted of 178 companies.

The information that emerged from our survey, which was conducted by administering a questionnaire and telephone interviews to the companies in the sample, indicates that 32 companies published a social report during the period considered[2].

The date of commencement of the fieldwork was chosen on the basis of the answers obtained in the said survey. We concluded that the essential factors in the process of development of social accounting in Italy were (i) formalisation of the position of the EU in relation to CSR issues in general, and social accounting in particular, and (ii) the actual availability of CSR reporting guidelines and models. As regards the guiding role performed by the EU, the publication of COM 2001 366 and COM 2002 347 (as amended) represented a crucial stage in the process of making companies aware of CSR reporting. As regards the availability of models and guidelines, our study indicated that the majority of companies in the sample use versions of the reporting models proposed by GRI(2002), GBS(2001) and ABI-IBS (2001), as amended.

Data

The application of the model explained required the use of different kinds of data, which were consequently obtained in different ways.

The values relating to book value per share (BPS), earnings per share (EPS) and stock price (P) were extrapolated from the DATASTREAM database. In particular, the BPS and EPS data are those relating to the quarterly reports supplied by the companies in the sample.

[1] The data currently available only enabled us to include the first two quarters of 2008 in the analysis.
[2] The results of the survey were published in our paper "The CSR in Italian listed Companies", in press.

The values of P are the official stock market values recorded 10 days after the quarterly report on the accounting values. For the robustness tests we used the official stock market values of P recorded 30 days after the quarterly report on the accounting values.

As regards the values assigned to variable dummy d_SR in the various reference periods, the data were obtained in the above-mentioned survey.

A total of 4094 observations were made, reduced to 3121 in the regression analysis due to the lack of some accounting data.

5 – Empirical analysis and results

Descriptive Statistics

Tables 1, 2 and 3 present some descriptive figures of the variables used in the empirical analysis. We split the entire sample (table 1) into companies which publish a social report (table 2) and companies which do not (table 3).

Firstly, for the entire sample, the simple mean (median) of the stock price 10 days after the publication of accounting information is almost equal to the values after 30 days, i.e. € 7.9 (€ 4.3). The mean (median) of the book value per share amounts to € 4.77 (€ 2.62), while that of earnings per share is € 0.09 (€ 0.05).

The range of the stock price is quite high, as it varies from nearly zero to € 103.71 if we consider the stock price 10 days after the end of each quarter, or from nearly zero to € 99.36 if we consider the price after 30 days.

The book value per share varies from a negative value of - € 1.43 to a positive value of € 174.03 (the negative BPS values are the result of consolidation techniques used in the financial reporting of three companies in the sample), while earnings per share are between - € 9.62 and € 10.51. The coefficient of variation shows that there is a higher variability from the mean for earnings per share, while a lower value of variability from the mean is observed for the stock price.

Moreover, tables 1, 2 and 3 clearly show that both stock price and accounting values are higher for companies which publish a social report.

In particular, the mean (median) stock price after 10 days is € 10.7 (€ 7.65) for companies which publish a social report, and € 7.44 (€ 3.94) for companies which do not.

Similarly, book value per share and earnings per share are significantly higher for companies which publish a social report (their mean values are € 5.47 and € 0.19 respectively for companies which publish a social report and € 4.63 and € 0.08 respectively for companies which do not).

Furthermore, the variability from the mean of stock prices and accounting values is higher for companies which do not publish a social report than for companies which do.

Thus, this descriptive analysis indicates that companies which publish a social report have higher accounting values and stock prices. In the next section we show whether there is a correlation between CSR and determination of the stock price.

Table 1 – Descriptive Statistics for total sample

	Mean	Median	Min	Max	*Standard Deviation*	*Coefficient of variation*
Stock price after 10 days	7.91	4.33	0.009	103.71	*9.85*	*1.24*
Stock price after 30 days	7.91	4.34	0.008	99.36	*9.88*	*1.25*
BPS	4.77	2.62	-1.43	174.03	*9.11*	*1.91*
EPS	0.09	0.05	-9.62	10.51	*0.42*	*4.53*
Observations	4094					

Notes: The sample consists of 4.094 firm/quarter observations that were listed on the Italian Stock Exchange during the period 2002-2008 (more particular: the last quarter 2002 to the first two quarters of 2008). The values relating to book value per share (BPS), earnings per share (EPS) and stock price after 10 days and after 30 years were extrapolated from the DATASTREAM database.

Table 2 – Descriptive Statistics for companies which publish social report

	Mean	Median	Min	Max	*Standard Deviation*	*Coefficient of variation*
Stock price after 10 days	10.70	7.65	0.45	57.70	*9.87*	*0.92*
Stock price after 30 days	10.68	7.56	0.45	55.87	*9.86*	*0.92*
BPS	5.47	3.46	0.52	26.03	*4.77*	*0.87*
EPS	0.19	0.11	-0.58	1.85	*0.25*	*1.31*
Observations	600					

Notes: The sample consists of 600 firm/quarter observations that were listed on the Italian Stock Exchange during the period 2002-2008 (more particular: the last quarter 2002 to the first two quarters of 2008). The values relating to book value per share (BPS), earnings per share (EPS) and stock price after 10 days and after 30 years were extrapolated from the DATASTREAM database.

Table 3 – Descriptive Statistics for companies which do not publish social report

	Mean	Median	Min	Max	*Standard Deviation*	*Coefficient of variation*
Stock price after 10 days	7.44	3.94	0.009	103.71	*9.77*	*1.31*
Stock price after 30 days	7.44	3.94	0.008	99.36	*9.80*	*1.32*
BPS	4.63	2.45	-1.43	174.03	*9.73*	*2.10*
EPS	0.08	0.04	-9.62	10.51	*0.44*	*5.91*
Observations	3494					

Notes: The sample consists of 3.494 firm/quarter observations that were listed on the Italian Stock Exchange during the period 2002-2008 (more particular: the last quarter 2002 to the first two quarters of 2008). The values relating to book value per share (BPS), earnings per share (EPS) and stock price after 10 days and after 30 years were extrapolated from the DATASTREAM database.

Regression Analysis

We will begin by discussing the estimates obtained with Pooled OLS estimators (table 4).

First of all, coefficients β_1 and β_2 in the basic model and do not substantially differ from those of our model given by eq. [2]. In particular, β_1 and β_2 estimate in eq. [1] are 0.72 and 3.51 respectively. Estimating the eq. [2] we obtain 0.69 and 2.70, respectively. The model therefore seems to be robust.

Furthermore, R-squared and adj. R-squared vary from 0.54 to 0.57; the regression model thus seems to fit the data quite well. In all regressions the coefficients are always highly significant, as the associated p-values are lower than 0.01, and the F-tests also confirm the joint significance of all coefficients at 1% level. It is also worth noting that the F-tests on the joint significance of the coefficients of the dummy and the interaction variables show that there is a significant difference in the value-relevance equation between the group of companies which publish a social report and those which do not.

If we consider stock prices after 10 days, the coefficient relating to dummy d_SR is negative and significant (- 3.26). This means that, all other factors being equal, the stock price of companies which publish a social report is € 3.26 lower than those of companies which do not.

However, estimates of the interaction variables show that the impact of accounting values on the stock price is higher for companies which publish the document, as the coefficients of the interaction variables are positive and significant. In particular, the coefficients of the interaction variables amount to 0.64 for BPS * d_SR and 8.12 per EPS * d_SR. This means, for example, that if the book value per share increases by € 10, the stock price increases by € 13.3 (i.e. € (0.69+0.64)*10) for companies which publish a social report, and by € 6.9 for companies which

do not. Similarly, if the earnings per share increase by € 10, the stock price of companies that publish a social report increases by € 81.2 more than that of companies which do not.

Table 4 Pooled OLS estimates with stock price after 10 days

	Basic Model			**Our Model**		
	Coefficient	**Student's t-test**	***p-value***	**Coefficient**	**Student's t-test**	***p-value***
d_SR				-3.26	-7.83	*0.000*
				(0.42)		
BPS	0.72	8.74	*0.000*	0.69	9.11	*0.000*
	(0.08)			*(0.08)*		
BPS*d_SR				0.64	5.72	*0.000*
				(0.11)		
EPS	3.51	3.67	*0.000*	2.70	3.48	*0.000*
	(0.96)			*(0.78)*		
EPS*d_SR				8.12	4.64	*0.000*
				(1.75)		
constant	2.45	5.25	*0.000*	2.56	5.71	*0.000*
	(0.47)			*(0.45)*		
No. of Obs		3121			3121	
R-Squared		0.5372			0.5729	
Adj. R-squared		0.5360			0.5714	
F-test		37.69			95.02	
p-value		*0.000*			*0.000*	
F-test on coefficients of dummy and interaction variables					36.25	
p-value					*0.000*	

Note: all regressions include yearly dummies; standard errors in parentheses (robust to heteroskedasticity).

If the stock price is considered 30 days after the end of each quarter, the results do not substantially differ from those obtained when considering the stock price 10 days after publication of the accounting information (table 5).

Table 5 Pooled OLS estimates with stock price after 30 days

	Basic Model			**Our Model**		
	Coefficient	**Student's t-test**	***p-value***	**Coefficient**	**Student's t-test**	***p-value***
d_SR				-3.29	-8.03	*0.000*
				(0.41)		
BPS	0.72	8.75	*0.000*	0.69	9.12	*0.000*
	(0.08)			*(0.08)*		
BPS*d_SR				0.65	5.84	*0.000*
				(0.11)		
EPS	3.64	3.76	*0.000*	2.84	3.6	*0.001*
	(0.97)			*(0.79)*		
EPS*d_SR				8.03	4.46	*0.000*
				(1.80)		
constant	2.20	4.79	*0.000*	2.31	5.26	*0.000*
	(0.46)			*(0.44)*		
No. of Obs		3121			3121	
R-Squared		0.5366			0.5728	
Adj. R-squared		0.5354			0.5713	
F-test		38.91			101.37	
p-value		*0.000*			*0.000*	
F-test on coefficients of dummy and interaction variables					37.53	
p-value					*0.000*	

Note: all regressions include yearly dummies; standard errors in parentheses (robust to heteroskedasticity).

In particular, the coefficient relating to dummy d_SR is negative and significant (-3.29), coefficient β_1 remains unchanged in both models (0.72 and 0.69 respectively), coefficient β_2 varies slightly (from 3.51 to 3.64 in the basic model and from 2.70 to 2.84 in our model).

The coefficients of the interaction variables are positive and significant and remain substantially unchanged (0.65 for BPS * d_SR and 8.03 for EPS * d_SR respectively).

6 – Conclusions

This study examined two research hypotheses. The first hypothesis involved testing whether the publication of a social report directly influences the stock price. The second hypothesis tested relates to the indirect influences that the publication of a social report has on the stock price because it modifies the relevance of the other explanatory accounting variables (BPS and EPS).

The research model used is based on the classic formulation of the value-relevance analysis, to which we added the variable "publication of a social report" whose value-relevance was to be tested. That variable is explained in the model in terms of a dummy variable. The sample selected consisted of 178 companies, 32 of which publish a social and ethical report, observed at quarterly intervals during the reference period.

The results give rise to a number of considerations. Firstly, the estimates demonstrate a significant negative correlation between the publication of a social report and the stock price. It can therefore be stated that, all other factors being equal, the market does not appreciate the social commitment of the firm described in the report. The nature of the information contained in social reports suggests that the allocation of resources (financial and human) to social activities which are not closely associated with the performance of core business operations is interpreted by investors as diverting resources to other purposes which are not equally remunerative. However, we would repeat that the market recognises the publication of a social report as value-relevant as regards the stock price.

As regards accounting variables, the estimates obtained confirm the value-relevance of BPS and EPS to the stock price in the two models tested (eq. [1] and eq. [2]). In both cases, BPS and EPS both show a significant positive correlation with the stock price. The values of the BPS and EPS coefficients are slightly lower in our model than the estimates made by applying the basic model. Investors consequently continue to place great importance on BPS and EPS accounting information. However, the results obtained with both the models tested assign a higher "weighting" to EPS than BPS. This means that, whether or not a social report is published, the EPS accounting information continues to play a crucial role, and has a highly relevant value.

If we consider the results obtained regarding the interaction between our dummy variable and the accounting variables contained in the model, there is clearly a significant positive correlation as regards the link between BPS, dummy variable and stock price. In fact, all other factors being equal, BPS accounting information is more relevant in the case of companies that publish a social report. This result seems to be in line with the contents of the social report. That document also contains additional information to that set out in the annual accounts, regarding specific existing and planned investments, and existing and potential debts payable debts. Therefore, it seems that the publication of a social report offers to investors more information about the composition and future trends of the BPS, and thus increases the value-relevance of the BPS for companies that publish a social report.

Moreover, interesting results were obtained for the interaction between our dummy variable and EPS. Our estimates indicate a positive and significant correlation as regards the link between EPS, dummy variable and stock price. We conclude that, all other factors being equal, EPS accounting information is more relevant in companies that publish a social report. In other words, the social report seems to be perceived as a source of information about the trend and composition of EPS additional to that contained in the annual accounts. In practice, a positive value of the coefficient of correlation indicates that attention is paid to the information contained in the social report, and that information alter the value-relevance assigned to EPS in relation to the stock price.

This study represents our first attempt to establish whether social report constitutes a relevant variable for the stock market, and in particular whether it influences stock prices. Our perspective studies will address the question of value-relevance of social report in a more exhaustive regression analysis. In view of the limitations of OLS estimators, we wish develop our analysis by using the estimator Least Square Dummy Variable model (LSDV), which consists of including a dummy variable specific to each company to estimate fixed effects. In order to test whether the fixed effect model (FE) is more adequate than the OLS on the pooled data, we will ran the poolability test, which is a test of the joint significance of fixed effects.

In future studies, the value-relevance analysis could focus on more exhaustive topics than the subject covered in this paper. For example, social information could be explained by a variable other than the dummy, taking account of the specific contents of the social report. Other studies could present some interesting comparisons between different national situations in the light of the regulations governing accounting and voluntary information, which often differ in various countries.

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