

Are Management Commentaries driven by signalling strategies?

Evidence from the disclosure of profitability indicators

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Abstract

Signalling theory posits that the most profitable companies provide the market with more and better information in order to be fairly valued. Empirical evidence that relates companies' profitability to their disclosure habits, however, reveals disaccording results. In fact, this literature studies the general level of disclosure, which is influenced by many factors, making difficult to recognize the signalling strategy.

To better isolate the signalling mechanism, our paper centres on a focal point of the signals that companies send to the financial market: profitability indicators. Thus, our hypothesis is that the amount of profitability indicators disclosed by a firm is positively related to its profitability.

We analyse two countries, Italy and the UK, because they represent two very different cultural, economic, and legal contexts and we scrutinize the disclosure of profitability indicators in 2008 Management Commentaries.

After controlling for size, risk, industry, and country, our analysis supports the presence of signalling mechanisms. These results corroborate that literature which considers the market capable of autonomously controlling the production and use of information (Verrecchia, 1983). Under an operative point of view, our results call for an intervention of European standard setters in order to harmonize this form of communication and to avoid the risk that the European Directive 51/2003, which requires a generic obligation to communicate key performance indicators, is ineffective or, even, counterproductive.

Keywords: signalling theory, voluntary disclosure, profitability indicators

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1. Introduction

Contractual relations reflect economic decisions that, when approached rationally, are based on the quality, the reliability, and the timeliness of information related to the contract (Grossman and Stiglitz, 1980; Rasmusen, 1987; Laffont, 1989; Armstrong et al., 2010). When in the market some players are more and better informed than others, information asymmetries arise and impede the efficient allocation of resource (Akerloff, 1970). As regards capital markets, to reduce information asymmetries and avoid adverse selection mechanism, managers are interested and forced to release information to present and potential investors. This assumption is supported by the signalling theory. In particular, those firms which consider themselves underestimated by the market will have incentives to *signal* their actual value through a wider and better communication. Thus, signalling theory posits a positive relation between a firm's performance and its disclosure.

However, empirical evidence, which moves from this theoretical premise and relates the company profitability to the level of disclosure, indicates conflicting results. This literature studies the general level of company disclosure, which depends on several factors, making difficult to isolate the signalling effect (Ahmed and Courtis, 1999).

In order to better isolate the signalling mechanism, this paper focuses on a specific piece of information which represents the crux of the relation between insiders and prospective investors: profitability measures disclosed by means of specific indicators or ratios (Matsumoto, 1995).

Our aim is to verify the presence of signalling mechanisms in voluntary disclosure to the financial market. Specifically, we are expecting that the higher firm profitability the higher the number of profitability indicators released to the market.

The analysis focuses on the profitability indicators that are published in Management Commentaries. We focus on annual report communication as it is considered by the shareholder the most reliable, even if not timely, information provided by companies (Coleman and Eccles, 1998; Francis and Schipper, 1999; Botosan and Plumlee, 2002; Watts, 2006).

To strengthen the external validity (generalisability) of our research, we analyzed two countries, Italy and the UK. We have chosen these two countries because they represent very different cultural, economic, and legal contexts. We scrutinize the Management Commentary sections of a sample of firms for the 2008 fiscal year.

After controlling for size, risk, industry and general environment, the results support our hypothesis. According to the literature, firm's size appears also influential.

First, in the debate concerning the efficacy to rule the disclosure activity of a firm (Bayer et al. 2010), our results bring us to conclude that the market, as theorised since the beginning of the 1970s, seems capable of autonomously controlling the production and the use of information (see Verrecchia, 1983 and subsequent literature), concentrating it on the focal points of the agency relationship. Second, our results contribute to discipline the disclosure of key performance indicators in the annual report. Particularly, the European Directive 51/2003, art. 14 requires the inclusion in the annual report of *both financial and, where appropriate, non-financial key performance indicators relevant to the particular business*. Thus, the Directive provides a generic obligation which allows firms to voluntarily choose the indicators to include in the annual report. As our results document, the publication of profitability indicators under such legal requirement is subject to signalling mechanism, with more

profitable firms disclosing more indicators. On the other hand, less profitable firms, which could be not available to release that data without that imposition, are forced to communicate. Thus, that imposition, following the same signaling theory on market inefficiency, might induce firms to communicate useless indicators (information redundancy) or, even worse, to manipulate their disclosure. In this framework, the intervention of a standard setter that defines specific principles and rules about the communication of indicators in annual reports appears to be opportune.

The remainder of this paper is organised as follows: section two analyses the literature review concerning signalling theory and voluntary disclosure. Our sample is presented in section three, while measurements and research method are described in section four. After that, we will present and discuss our results. The concluding section summarises our conclusions and opportunities for future research.

2. Literature review and research hypothesis

The signalling theory was borne at the beginning of the 1970s and is based on two main research contributions, Arrow (1972) and Spence (1973). To overcome the classic theory limitations, above all the perfect competition hypothesis, Spence (1973) analyses the workforce market with the aim of drawing some general conclusions about information economics. The author's reasoning is simple: seeking for a job, an unemployed person has something to gain from sending signals to the market, thus keeping his talents in the public eye in order to prevail over other unemployed people.

This theory has been successively applied in a number of other areas, including voluntary disclosure. In this case, firms are supposed to use voluntary disclosure as a means of overcoming adverse selection: high performance firms are motivated to disclosure to

favourably distinguish themselves from other firms (Grossman, 1981; Milgrom, 1981; Verrecchia, 1983; Dye, 1985; Welker, 1995; Pae, 2002).

Penman (1980) applies the basic signalling hypothesis to the disclosure of earnings forecasts and finds that firms with good news more often voluntarily disclose earnings forecasts. Similarly, Clarkson et al. (1992) investigate a sample of Canadian IPO firms and point out that firms which disclose earnings forecasts tend to possess better news than non-disclosing firms. Moreover, Miller (2002) focuses on earnings announcements and documents a strong relation between earnings performance and the quantity, venue and type of disclosure by firms.

Most of the research concerning the relation between firm profitability and disclosure, however, centres on annual report communication. The evidence of these studies is contrasting.

Lang and Ludholm (1993) investigate the determinants of voluntary disclosure choice and find that disclosure scores are higher for firms that perform well. This positive relation between disclosure and profitability has been confirmed by Haiffa and Cooke (2002), Lim et al. (2007), Wang et al. (2008), Gamerschlag et al. (2010) for voluntary disclosure of Malaysian, Australian, Chinese and German listed companies respectively. Patton and Zelenda (1997), instead, consider both mandatory and voluntary disclosure items in Czech annual reports and indicate that more profitable firms disclose somewhat more information in their annual reports than less profitable firms. The results reported by Owusu-Ansah (1998) in their study on Zimbabwean listed companies, lastly, testify to a positive association between the firm profitability and the extent of annual report disclosure of mandatory items.

On the other hand, a long list of studies shows no significant relation between disclosure and firm profitability (McNally, 1982; Malone et al., 1993; Meek et al., 1995; Raffournier, 1995; Ho and Wong, 2001; Chau and Gray, 2002; Eng and Mak, 2003; Alsaeed, 2005; Cahan, 2005;

Patelli and Prencipe, 2007; Chau and Gray, 2010). Ahmed and Courtis (1999) interpret these inconclusive results as due to differences in socio-economic and political environments between countries, but also to the difficulties in measuring the disclosure level. Similarly, Miller (2001:175) asserts that the interpretation of findings is confounded by a general failure to control for events that are likely to influence the disclosure.

As regards literature on disclosure measurements, the whole voluntary information included in the annual report¹ is mainly analysed and it is taken as a proxy of the disclosure quality. The general level of disclosure is usually measured through a disclosure index that adopts *an item-based approach using a dichotomous procedure in which an item scores one if it is disclosed and zero otherwise* (Chavent et al., 2006:184).² On the basis of this approach, the index developed by Meek et al. (1995) to compare the voluntary disclosure between US, UK and others European companies has become a model for following studies (Botosan, 1997; Chau and Gray, 2002; Lim et al. 2007; Chau and Gray, 2010). Meek's index consists of 85 different items that range over different subjects: strategic information, as firm's organizational structure or forecast on future performance; non-financial information, as data on employees or social policies; financial information, as segmental reporting or the stock's trend. It appears likely, therefore, that the very different disclosure contexts, included in an index like Meek's, may reflect different firm communication strategies.

Subsequent research on information asymmetries shows that the conflicting nature of the relationships between principal and agent causes the latter to focus the signal they send to the

¹ In the last few years the analysis of the disclosure determinants has increasingly interested specific contexts of voluntary disclosure: environmental disclosure (Gray, 2001; Gamerschlag et al., 2010); segment information (Prencipe, 2004); intellectual capital (Li et al., 2008); risk disclosure (Abraham and Cox, 2007) represent some of the most investigated area.

² A different approach in measuring annual report disclosure is represented by the *subjective approach* (Battie et al., 2004). Under such approach, firm disclosure score is determined by the subjective judgment of analysts or professionals (Lang and Lundholm, 1993). Anyway, as disclosure indexes, also this second type of measures assesses the general level of disclosure of firms.

market on a few focal points, which satisfy the users' primary information needs (Cho and Sobel, 1990; Kreps and Sobel, 1994; Schott, 1994; Christensen and Feltham, 2000).

In the financial market, the crux of the relationship between insiders and perspective investors is represented by the profitability measures, providing the increasing capital is the object of the contract. In fact, very often profitability targets represent also specific conditions on which to enter into or renew the agency contract, including, but not limited to, covenants, management stock options, and preference shares (Healy and Palepu, 2001).

Much literature suggests that investors make their economic decisions based on the profitability measures. A first line of research observes analysts' behaviour. The results clearly show that the main tool analysts use to evaluate the performance of a company is represented by a set of ratios which are based on financial statement figures or market values (Gibson, 1980; Gibson, 1987; Matsumoto et al., 1995; Weetman and Beattie, 1999; AIMR, 2000; Gomes et al., 2004; Gomes et al., 2007). Working on a list of sixty ratios, Gibson (1980) asks a group of analysts to gauge the importance of each of those indicators. As a result, profitability indicators are said to be the most important. Return on equity, in particular, is considered the most relevant ratio followed by the price/earnings ratio. The other four, in order of importance, are all profitability indicators: earnings per share, net profit margin after tax, return on equity before tax, and net profit margin before tax. A similar research has been conducted by Matsumoto et al. (1995) with similar results: market and profitability indicators are the most important followed by other growth indicators.

On a different perspective, literature indicates that some profitability indicators are highly correlated with stock market return, confirming the strong informative power of these measures (e.g. Beaver et al., 1970; Bowman, 1979; Hill and Stonde, 1980; Martikainen, 1989; Salmi et al., 1997; Lewellen, 2004). At the same time, profitability indicators are used to measure the operating and financial risk of a company (Elgers and Murray, 1982). In the

studies on the predictions of corporate failures, the profitability indicators stand out for their importance (e.g., Altman 1968; Beaver, 1968; Neophytou and Mar Molinero, 2004; Hillegeist et al., 2004; Beaver et al., 2005). Lastly, in merger and acquisition operations, profitability indicators are considered key measures (e.g., Belkaoui, 1978; Palepu, 1986; Barnes, 1990; Zanakis and Zopounidis, 1997; Sorensen, 2000).

Since, as predicted by the theory, the signalling mechanism operates on key information, which is represented by profitability indicators, we can formulate the following research hypothesis:

HP: The number of profitability indicators included in the annual report is positively related to firm profitability.

Few studies investigate ratio disclosure practices. Watson et al. (2002) analyse their publication strategies in the UK and find that profitability performance affects ratio disclosure only in 1989, under an economic recession period. Moreover, no relation between profitability performance and profitability ratio disclosure has been found. Morrison and Harrison (2009) focus on Australian listed companies to understand how different disclosure theories can explain voluntary ratio disclosure in annual reports. They found support for signalling theory only for those that they call “investment ratios” (dividends per share, dividend payout, total shareholder return, net asset backing per share) with more profitable firms devoting greater space to their disclosure. The disclosure of profitability ratio, instead, seems to be positively related to the firm size. Lastly, Abdullah and Ku-Ismail (2008) find that the number of ratios published in Malaysian listed companies is influenced by size, industry and liquidity, while profitability does not appear to have any effect.

3. Dataset

Italy and the UK were selected as countries of interest because they represent two opposing models of the European cultural, economic and regulatory environments (Cooke and Wallace, 1990; Nobes, 1998; La Porta et al., 1998; Leuz et al., 2003). The UK is a common-law orientation country and it has an outsider economy with a large stock market, dispersed ownership, strong investor rights and strong legal enforcement (Leuz et al., 2003). Italy, on the other hand, has a civil-law tradition with an insider economy based on a credit system, ownership concentration, a low level of investor protection and weak legal enforcement (La Porta et al., 1998). Moreover, financial reporting in Italy is strongly influenced by corporate law and taxation (Nobes, 1998).

Our study includes a 160-company sample of Italian and UK listed companies from the manufacturing and service industries. Banks, insurance companies, and real estate companies were excluded because they have different reporting and legal requirements as well as different disclosure practices (Hossain et al., 1994). The analysis was conducted on 2008 annual reports, a financial year that has experienced a profound and unexpected world-wide crisis that has widened the differences among firms' performance. In such a contest, it is considered that signalling mechanisms are more easily identifiable.

Given the time-consuming process of coding the annual reports, our objective was to compose a representative sample of 80 Italian and 80 UK firms. Companies have been randomly extracted from the record of the listed companies included in the AMADEUS databank for the two countries. The selected companies have been divided into eight macro-sectors: Chemicals, Consumer Goods, Consumer Services, Information and Communication Technology (ICT), Industrial Services, Industrial Goods & Construction, Media, and Utilities. The 2008 annual reports have been collected from AMADEUS databank when available or, otherwise, they have been downloaded by the company web-site. Sample composition by country and sector of activity is reported in Table 1.

Table 1 – Sample size by country and sector of activity

	Italy	UK	Total
Chemicals	10	5	15
Consumer Goods	20	11	31
Consumer Services	5	14	19
ICT	8	5	13
Industrial Services	10	17	27
Industrials Goods & Constructions	9	18	27
Media	9	7	16
Utilities	9	3	12
Total	80	80	160

As integrative information, Profitability Indicators (PIs) should be preferably included in the Business Review. Nevertheless, the voluntary nature of this information allows managers to include PIs also in other sections of the annual report, as, for example, the President Letter or the Highlights. Consequently, the entire annual report is examined for each firm, with the exclusion of the regulated sections (Financial statements and the Notes). PIs have been gathered considering two main types of profitability measures (Watson et al., 2002): capital return measures (e.g., ROE, ROI, ROCE) and measures of profit margins (e.g., EBIT, EBTDA).

4. Measurement and method

Variables measurement

Several profitability measures have been employed in disclosure literature in measuring the firm profitability (see Appendix A). Most of them are capital return measures, and the “net profit on equity” is the most widespread index (Sinvhi and Desay, 1971; McNally et al., 1982;

Malone et al., 1993; Raffournier, 1995; Inchausti, 1997; Patton, 1997; Owusu-Ansah, 1998; Ho and Wong, 2001; Haniffa and Cooke, 2002; Eng and Mak, 2003; Cahan et al., 2005; Chavent et al., 2006; Lim et al., 2007; Chau and Gray, 2010) followed by the “net profit on total assets” (McNally et al., 1982; Eng and Mak, 2003; Cahan et al., 2005; Wang et al., 2008). Rarely researchers choose different income measures to assess the return of capital: operative income (Inchausti, 1997; Patelli and Prencipe, 2007); profit before tax (Wallace et al., 1994; Wallace and Naser, 1995); profit before extraordinary items (Chen and Jaggi, 2000). Measures of return of capital are often tested alternatively with profit margin measure, above all the “net profit on sales” (Sinvhi and Desay, 1971; Malone et al., 1993; Owusu-Ansah, 1998; Chavent et al., 2006).

On the basis of the review of this literature, two different measures are selected and alternatively included in our regression model: Net Profit on Equity (NP/E); Operative Profit on Total Assets (OP/TA).

Some control variables are included in the model, referring to the main literature. Those variables are: firm size, degree of risk, industry, and country.

Firm size (SIZE)

There is a general agreement concerning the existence of a positive relationship between the size of a company and the extent of its disclosure, supported by several reasons. Firm size is considered to affect voluntary financial disclosure by influencing the magnitude of agency costs (Leftwich et al., 1981; Holthausen and Leftwich, 1983; Kelly, 1983). In addition, it is generally agreed that the larger the company, the greater the information asymmetry with current and prospective fund providers (Prencipe, 2004). Larger firms are also considered better able than smaller firms to afford both direct and indirect disclosure costs (Meek et al., 1995). Lastly, larger companies are more followed by financial analysts and other

stakeholders, and, thus, the pressure on the company in order to release information is supposedly stronger (Schipper, 1991).

On an empirical point of view, the influence of the firm size on disclosure has been well documented in several studies (Cooke, 1989; Lang and Lundholm, 1993; Wallace et al., 1994; Hossain et al., 1995; Inchausti, 1997; Prencipe, 2004; Depoers, 2000; Cahan et al., 2005; Lim, 2007; Patelli and Prencipe, 2007; Chau and Gray, 2010). As regards ratio disclosure, Watson et al. (2002) and Abdullah and Ku-Ismail (2008) point out a positive relation between company size and disclosure of financial ratios, while Morrison and Harrison (2009) do not find any significant relation.

Risk (RISK)

Following agency theory, a positive relation between the risk level and the extent of disclosure may be expected: the higher risky firms, due to higher proprietary costs, should be likely to disclose more than others. Few empirical evidence in disclosure literature shows conflicting results about this relation. Garsombke (1979) and Firth (1984) do not find any correlation between the risk level, measured by the *beta* index, and the amount of voluntary communication in the annual report. Patton and Zelenka (1997) include risk in their regression model which investigates the determinants of disclosure in annual reports in the Czech Republic. They divide the level of risk into two components: the operational risk, measured by the weight of intangible assets, and the financial risk, measured by the leverage ratio. Their results document that neither of the two risk proxies are significantly related to the disclosure practises.

For the rest, the majority of the studies investigated the financial risk dimension and find divergent results. Bradbury (1992), Mitchell et al. (1995), Inchausti (1997) and Prencipe (2004) give evidence of a positive relation. On the contrary, Chow and Wong-Boren (1987), Hossain et al. (1994, 1995), Meek et al. (1995), Raffournier (1995), Ho et al. (2001), Patelli

and Prencipe (2007) and Wang (2008) find no significant relation, while Eng and Mak (2003) report even a negative significant relation.

Industry (IND)

Industry is recognized to be a significant factor in influencing disclosure practices under signalling theory, since companies wish to show an alignment with the best disclosure practices (Watson et al., 2002). On the same position there are Cooke (1991) and Wallace et al. (1994). Nevertheless, Watts and Zimmerman (1986) consider that the effect of industry on disclosure can be obfuscated by firm size. Divergent empirical findings document the difficulties in separating industry-effect from other variables. For example, Cooke (1992), Camffermann and Cooke (2002), and Lim et al. (2007) point out the presence of an industry-effect on the disclosure while Wallace et al. (1994), Inchausti (1997) and Chavent et al. (2006) do not find any significant relation.

Institutional environment (COUNTRY)

Environmental factors are considered to play a relevant role in influencing firm disclosure practices. Many studies investigate how institutional variables, such as culture, legal orientation, and economic structure, affect firm activity and its communication (La Porta et al., 1998; Jaggi and Low, 2000; Hope, 2003; Vanstraelen et al. 2003; Bushman et al., 2004). La Porta et al. (1998) give evidence that the “legal origin” is the more representative proxy for certain environmental variables, such as economic structure, legal enforcement, investor protection and accounting rules. They maintain that common-law oriented countries are more inclined to provide the market with voluntary disclosure than civil-law oriented countries. Moreover, Francis et al. (2005) affirm that economies based on the credit system are characterised by a lower level of voluntary disclosure than economies based on financial markets because credit-system oriented economies mainly recur to private information.

As regards our model, we use two multiple regression models to test the relationship between the amount of PIs disclosure and the profitability measure. Normality tests are preliminary run for all independent continuous variables. Firm size is transformed using logarithmic transformation since it does not appear normally distributed.

The regression equations are the followings:

$$PIs = \beta_0 + \beta_1 NP/E + \beta_2 COUNTRY + \beta_3 SIZE + \beta_4 RISK + \beta_5 IND + \varepsilon$$

$$PIs = \beta_0 + \beta_1 OP/TA + \beta_2 COUNTRY + \beta_3 SIZE + \beta_4 RISK + \beta_5 IND + \varepsilon$$

where:

PIs = Number of profitability indicators published in 2008 annual report.

NP/E = Net profit on Equity at the end of 2008 fiscal year.

OP/TA = Operative profit on Total assets at the end of 2008 fiscal year.

COUNTRY = dummy variable, identifying the country origin of the firm (Italy/UK).

SIZE = natural logarithm of sales for 2008 fiscal year.

RISK = firm's *beta* index at the end of 2008 fiscal year.

IND = dummy variable, indentifying the industry.

5. Results

Descriptive statistics and univariate analysis

The descriptive statistics for the PIs are reported in Table 2. The average number of PIs disclosed by the sample firms is 2.58 and the low standard deviation show that the communication practices are quite similar. Moreover, there are no significant differences between the two countries, as the non parametric Kruskal-Wallis test on the mean values indicates (p-value=0.1646).

Table 2 – Descriptive statistics for PIs

		Mean	Median	StDev
<i>Dependent variable</i>				
PIs	Total	2,58	2,00	1,35
	<i>Italy</i>	2,43	2,00	1,35
	<i>UK</i>	2,73	2,00	1,34
<i>Kruskal-Wallis chi-squared (p-value) = 0.1646</i>				

Table 3 presents the descriptive statistics for the quantitative independent variables, both primary and control variables, employed in the models. The UK companies are more profitable, on average, than the Italian companies. In particular, the net profit on net worth (NP/E) appears sensibly higher for the UK firms, while the differences in the operative profitability (OP/TA) are smaller. Looking at the standard deviation, the values appear similar for the two countries. It means that the higher profitability of the UK firms is not related to the outstanding performance of a few outliers, but rather it is a generalised condition. Differences in profitability performance may be influenced by the firm size (SIZE), since the UK sample companies are significantly larger than the Italian ones. Nevertheless, the mean value of the UK sample is strongly influenced by the huge value of one company (Royal Dutch Shell). Therefore, this outlier is also responsible for the high standard deviation in the UK sample.

Table 3 – Descriptive statistics for the independent measures

		Mean	Median	StDev
<i>Primary independent variables</i>				
NP/E	Total	6,81%	8,92%	0,21
	<i>Italy</i>	4,16%	7,49%	0,18
	<i>UK</i>	9,50%	11,16%	0,22
OP/TA	Total	6,40%	6,24%	0,09
	<i>Italy</i>	5,69%	5,30%	0,08
	<i>UK</i>	7,07%	6,41%	0,09
<i>Control variables</i>				

SIZE (mgl/€)	<i>Total</i>	5.311.319	536.937	26.411.507
	<i>Italy</i>	2.104.646	327.011	7.570.318
	<i>UK</i>	8.517.991	1.347.000	36.411.946
RISK	<i>Total</i>	1,02	1,00	0,39
	<i>Italy</i>	0,97	0,94	0,38
	<i>UK</i>	1,06	1,08	0,39

The *beta* index (RISK) is noted to be lower in the Italian firms and this fact seems to contradict the evidence of the more leveraged Italian firms (Panno, 2003). However, the *beta* index synthetizes also the operational risk and not only the financial one. Considering that the sample is not stratified for the control variables, the higher level of risk for the UK companies should not invalidate our results.

Multivariate analysis

The correlation matrix is reported in Table 4. As expected, significant correlations exist between the two measures of profitability and the dependent variable (PIs). A significant correlation is also revealed between PIs and the control variables.

The profitability measures are clearly highly correlated, but this result does not involve any collinearity problem since they are alternatively included in the regression model. On the contrary, the correlations among the independent variables, including the control variables, are relatively low so that they are unlikely to pose a serious problem in the interpretation of the results (Hossain, 1995).

Table 4 – Pearson correlation matrix

	PIs	NP/E	OP/TA	RISK	SIZE
PIs	1				
NP/E	0.2950**	1			
OP/TA	0.3828**	0.7650	1		
RISK	-0.0026**	- 0.1869**	- 0.1118**	1	
SIZE	0.2032**	0.1148**	0.1449**	0.1450*	1

Signif. Codes: ** p-value<0.01; * p-value<0.05

To further assess the potential for multicollinearity, the regressions of all explanatory variables on PIs (not reported) are performed and the variance inflation factors (VIF) are calculated. VIF figures for all the independent variables are well below 10, indicating that there is not a serious multicollinearity problem³.

The results of regression tests are shown in Table 5 and Table 6.⁴

Table 4 – Regression results (NP/E as independent variable)

Variables	Pred. sign	Coeff.	p-value
(Intercept)		-0.20840	0.83317
PROF(NP/E)	+	1.1337	0.00791**
SIZE	+	0.23408	0.00313**
BETA	+	-0.29001	0.41357
COUNTRY[T.UK]		0.14458	0.56553
IND[T.Consumer Goods]		-0.09513	0.85026
IND[T.Consumer Services]		-0.15401	0.77872
IND[T.ICT]		-0.01659	0.97711
IND[T.Industrial Goods]		-0.06309	0.90521
IND[T.Industrial Services]		-0.29053	0.57549
IND[T.Media]		-0.53145	0.3454
IND[T.Utilities]		-0.88707	0.14598
Adjusted R-squared: 0.1219			
F-statistic: 2.553		p-value: 0.0006412	

* p-value < 0.05; ** p-value < 0.01; *** p-value < 0.001

Table 6 – Regression results (OP/TA as independent variable)

Variables	Pred. sign	Coeff.	p-value
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³ VIF measures the degree to which each explanatory variable is explained by the others and *very large VIF values indicate high collinearity and a common cut-off threshold is VIF values above 10* (Hair et al., 1995:127).

⁴ First the General Linear Model (GLM) was employed to fit the data, given the characteristics of the dependent variable. The GLM analysis gives substantively similar results. Hence, we conclude that the results are not sensitive to the estimation technique.

(Intercept)		-0.30345	0.739901
PROF(OP/TA)	+	3.65468	0.001513**
SIZE	+	0.24049	0.000926***
BETA	+	-0.39097	0.225334
COUNTRY[T.UK]		0.15378	0.521034
IND[T.Consumer Goods]		-0.21480	0.658906
IND[T.Consumer Services]		-0.38215	0.463239
IND[T.ICT]		-0.06539	0.906919
IND[T.Industrial Goods]		-0.19366	0.703729
IND[T.Industrial Services]		-0.25334	0.606150
IND[T.Media]		-0.53560	0.324547
IND[T.Utilities]		-0.90778	0.123439
Adjusted R-squared: 0.1549			
F-statistic: 3.2		p-value: 0.00076	
* p-value < 0.05; ** p-value < 0.01; *** p-value < 0.001			

The F statistic confirms that both the regression models are significant (p-value<0.001). Nevertheless, the total variability captured by our variables varies from 12.19% for the model which employ NP/E to 15.49% for the model including OP/TA.

Results reveal a positive correlation between profitability and the number of PIs for each model: firms with higher profitability appear to pay attention to disclose their results through suitable ratios. As regards the control variables, dimension is the only significant variable and its coefficient has positive sign in both the models. This result is in line with Watson et al. (2002). Conversely, the risk coefficient registers a sign contrary to the expectations. It indicates that the less risky firms are more inclined to publish profitability indicators. This result is not surprising considering the contradictory empirical findings highlighted in the literature. Ultimately, industry and country do not appear significant factors. It is plausible that the publishing of profitability indicators, being general and widespread measures, is not anchored to the industry and the country. As regards the insignificance of country effect, results are in line with Francis (2005).

6. Sensitivity analysis

To test the sensitivity of the results, we repeated the analysis with other two different performance measures widely used in literature: Net Profit on Total Assets (NP/TA) and Net Profit on Sales (NP/S). The results (not reported) are aligned with the findings discussed above.

Moreover, some studies document the existence of a close association between profitability measures and cash-flow measures (Gombola and Ketz, 1983). For this reason, we also test Cash Flow on Sales (CF/S) as independent variable. Results reported in Table 7 show that even if a positive relation exists between CF/S and PIs, it is not significant.

Table 7 – Regression results (CF/S as independent variable)

Variables	Pred. sign	Coeff.	p-value
(Intercept)		-0.24607	0.79090
PROF(CF/S)	+	3.84663	0.364039
SIZE	+	0.24151	0.00100**
BETA	+	-0.36621	0.26396
COUNTRY[T.UK]		0.14019	0.55951
IND[T.Consumer Goods]		-0.15132	0.75574
IND[T.Consumer Services]		-0.28706	0.57821
IND[T.ICT]		-0.01714	0.97567
IND[T.Industrial Goods]		-0.13915	0.78469
IND[T.Industrial Services]		-0.26111	0.59669
IND[T.Media]		-0.51338	0.34612
IND[T.Utilities]		-0.89747	0.12902
Adjusted R-squared: 0.1494			
F-statistic: 3.108		p-value: 0.001026	

* p-value < 0.05; ** p-value < 0.01; *** p-value < 0.001

Regardless the level (expressed in absolute value) of profitability, a firm might be (more) inclined to communicate because of a (positive) variation in its profitability. To take this

phenomenon into account, regression test is repeated assuming the variation of operating profitability between 2007 and 2008 (OP/TA_VAR) as independent variable. Results, reported in Table 8, are not significant. A possible explanation for this fact is that signalling strategies in the annual report operate on a time horizon wider than a year. Thus, year by year, signalling policies - i.e. is the number of indicators published in the annual report - are likely not to be reformulated. They are rather likely to depend on the competitive strength historically affirmed in the market and gradually transmitted to it. Conversely, the communication action of the management would lose credibility, due to its high variability year by year.

Table 7 – Regression results (NP/S as independent variable)

Variables	Pred. sign	Coeff.	p-value
(Intercept)		-0.56742	0.554491
PROF(NP/S)	+	1.13462	0.046039*
SIZE	+	0.27928	0.000216***
BETA	+	-0.47905	0.159335
COUNTRY[T.UK]		0.11885	0.627282
IND[T.Consumer Goods]		-0.17318	0.729397
IND[T.Consumer Services]		-0.17942	0.732597
IND[T.ICT]		-0.12771	0.823496
IND[T.Industrial Goods]		-0.14523	0.781391
IND[T.Industrial Services]		-0.21683	0.666637
IND[T.Media]		-0.52910	0.346210
IND[T.Utilities]		-1.05078	0.088276
Adjusted R-squared: 0.1186			
F-statistic: 2.614		p-value: 0.005045	

* p-value < 0.05; ** p-value < 0.01; *** p-value < 0.001

7. Conclusions

Decisions that move financial markets are based on the quantity, the reliability and the timeliness of information. Signalling theory predicts that more profitable firms send messages to reduce information asymmetries in the markets and allow investors to better value them. Due to the conflicting nature of the relation between insiders and investors, signalling mechanisms would focus on few focal points that satisfy the primary information needs of the users.

Even if signalling mechanism is well-supported under the theoretical perspective, empirical evidence investigating disclosure and profitability documents contrasting results.

To better isolate the signalling mechanism we analyze a specific piece of information, that is considered one of the main primary information needs of the users: profitability measures disclosed by means of specific indicators or ratios.

A multiple regression model verifies the existence of a relation between the number of profitability indicators disclosed and the firm profitability on a sample of Italian and UK firms. The 2008 Management Commentaries are scrutinized. Dimension, risk, industry, and country are assumed as control variables.

Our results highlight the presence of signalling mechanisms: the most profitable firms communicate a higher number of profitability indicators in the narrative section of their reports. Moreover, according to most of the literature, the dimension seems to be influential.

Our first conclusion is the support to signaling theory, confirming its validity in the annual disclosure communication. Specifically, our focus on profitability indicators has permitted to study the core disclosure activity of the companies, bringing signaling strategies to the light. In this way, as theorized from the beginning of the 1970s, the market seems to be autonomously capable of controlling the production and the use of information, concentrating it on the focal points of investor' needs (see Verrecchia, 1983 and subsequent literature).

Under an operative point of view, our results provide information to the international and national standard setters to develop future guidelines concerning the communication of performance indicators in the Management Commentary. In this perspective, our results seem to highlight the need of an intervention of standard setters in order to avoid that the European Directive 51/2003, which requires a generic obligation to communicate key performance indicators (without specifying the modalities of such communication), risks being ineffective or, even, counterproductive. In fact, as the European rule omits to determine the content and the form of this kind of information, profitable companies are naturally induced to communicate their competitive advantage, also without any external stimulus. Other companies, which can probably be not available to release that data without an imposition, are forced to communicate. That imposition, following the same signaling theory, could induce firms to communicate useless indicators (information redundancy) or, even worse, to “massage” their disclosure. This last hypothesis would configure a manipulation of the signal induced by external sources according to Kreps and Sobel (1994). As a consequence, the information asymmetry that the rule aims to reduce paradoxically would increase (Frost, 1994). In this framework, the intervention of a standard setter that defines principles and rules about the communication of indicators in annual reports appears to be opportune.

Finally, the fact that signalling phenomena are found both in market-oriented countries, such as the UK, and in credit-oriented countries, such as Italy, calls the need for standardized intervention at the European level.

The main limitation of this work is that we analyze only one year, but it would be interesting to observe the firms’ behaviors and the related signalling policies over a wider time horizon. However, some studies on disclosure behavior support the validity of one-year analyses, since they recognize a certain stability in communication policies (Gray et al., 2001:349). As future development, less profitable firms can be an interesting field of analysis in order to verify if

and to what extent they really tend to manipulate profitability indicator disclosure and, as a consequence, to express a judgment about the effectiveness of certain rules.

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Appendix. Summary of disclosure studies investigating relation between profitability and disclosure in annual reports

Study	Country	Dependent Variable (Index)	Reference in developing disclosure index	Profitability measure	Relation between profitability and disclosure
Sinvhi and Desay (1971)	USA	Aggregate	Cerf (1961)	Net Profit/Equity; Net Profit/Net Sales	positive
McNally et al. (1982)	New Zeland	Voluntary		Net Profit/Equity; Net Profit/Total Assets	no relation
Lang and Ludholm (1993)	Not specified	Aggregate	No disclosure index (FAF's ranking)	Market adjusted stock return	positive
Malone et al. (1993)	USA	Aggregate		Net Profit/Equity; Net Profit/Net Sales	no relation
Wallace et al. (1994)	Spain	Mandatory		Profit before tax/Sales; Profit before tax/Equity	no relation
Meek et al. (1995)	USA; UK; F; G; N	Voluntary		Profit after Tax and Interest/Sales	no relation
Raffournier (1995)	Switzerland	voluntary	Cooke(1992)	Net Profit/Equity	no relation
Wallace and Naser (1995)	Hong Kong	Mandatory		Profit before Tax/Sales; Profit before tax/Equity	negative for return on sales
Inchausti (1997)	Spain	Aggregate		Net Profit/Equity; Net Profit/Total Assets	negative

Appendix. Continued

Study	Country	Dependent Variable (Index)	Reference for disclosure index	Profitability measure	Relation between profitability and disclosure
Patton (1997)	Czech	Aggregate		Net Profit/Equity	positive
Owusu-Ansah (1998)	Zimbabwe	Mandatory		Return on Turnover; Return on Capital Employed	positive
Chen and Jaggi (2000)	Hong Kong	Mandatory	Wallace and Naser (1995)	Net Profit/Equity; Net Profit/Sales	no relation
Ho and Wong (2001)	Hong Kong	Voluntary		Net Profit/Equity	no relation
Chau and Gray (2002)	Hong Kong	Voluntary	Meek et al. (1995)	Not specified	no relation
Haniffa and Cooke (2002)	Malaysia	voluntary	Hossain et al. (1994)	Net Profit/Equity	positive
Eng and Mak (2003)	Singapore	Voluntary		Net Profit/Equity; Net Profit/Total Assets	no relation
Cahan et al. (2005)	17 country	voluntary	Botosan (1997)'s disclosure index	Net Profit/Total Assets	no relation
Chavent et al. (2006)	France	Aggregate		Net Profit/Sales; Net Profit/Equity	no relation

Appendix. Continued

Study	Country	Dependent Variable (Index)	Reference for disclosure index	Profitability measure	Relation between profitability and disclosure
Lim et al (2007)	Australia	Voluntary	Meek et al. (1995)	Net Profit/Equity	positive (for historical information)
Patelli and Prencipe (2007)	Italy	Voluntary	Botosan (1997)	Operative Income/Total Assets	no relation
Wang et al. (2008)	China	voluntary	Gray et al. (1995)	Net Profit/Total Assets	positive
Chau and Gray (2010)	Hong Kong	voluntary	Meek et al. (1995)	Net Profit/Equity	no relation
