Signaling Financial Performance

with Alternative Performance Measures

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Abstract

We apply signaling theory to explain the voluntary disclosure of alternative performance measures (APMs) in earnings announcements' press releases of European firms. As APMs are voluntary measures that are not audited or regulated they can be used by management to strategically communicate positive information about the firm's performance. We consider that the use of APMs to strengthen the performance signal varies both with capital market pressures and product market competition. While capital markets give management incentives to signal high performance, competition can either increase APM performance signaling to show competitive advantage or reduce APM signaling if the signaling costs are too high. We hand-collect the APMs disclosed by the largest industrial European firms. We find that the strength of the APM's signal increases with capital markets pressure, i.e. when firms fail to meet their earnings benchmarks with accounting earnings. Moreover, the strength of the signal is positively associated with the level of industry competition but only for firms with good performance. In a competitive environment the cost of disclosing dishonest signals are too high for the low performing firms.

1. Introduction

We apply signaling theory to study the voluntary disclosure of alternative performance measures (APMs) by European firms. We use a unique dataset of hand-collected performance indicators disclosed by managers in earnings announcements' press releases to test whether capital market incentives and product market competition influence APM disclosure. We propose that managers use these voluntary indicators strategically to signal financial performance to investors and industry competitors. But the cost of signaling varies with the relative performance of the firm in its industry.

APMs are management-made indicators of financial performance.[1] Typically, managers calculate APMs by excluding from earnings prepared under accounting rules (i.e., Generally Accepted Accounting Principles or GAAP) expenses that they claim are transitory, and thus unrelated with future firm performance. Managers argue that APMs represent the recurrent future performance of the business better than accounting earnings because these are based on strict rules that do not reflect the specificities of the business. Common examples of excluded expenses are special items, impairment losses, restructuring costs, amortization of intangible assets, goodwill impairments, and costs related to stock-options. As a result of excluding mostly expenses, APMs usually provide a more favorable image of firm performance than that reported in the GAAP-based financial statements.

Given that APMs are disclosed voluntarily, do not follow accounting standards, are not verified by auditors, and are largely unregulated they can be used by managers strategically. While they can be used to reduce information asymmetry about the true

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[1] Alternative performance measures (APMs) are also called pro forma measures, or non-GAAP measures in the accounting and finance literature. To be consistent with the terminology used by the European Securities and Markets Authority we adopt the term APMs.

performance of the firm, enhancing investors' ability to forecast future performance, there is mounting concern expressed by public entities and the business community that managers can disclose APMs with deceitful intentions that economic agents may not be able to unravel (The Economist, 2016, 30th April; The Wall Street Journal, 2016, 3rd August).

We study the disclosure of APMs made by industrial firms, included in the Financial Times 2006 classification of the 500 largest European companies, for the period of 2003-2011. This sample allows us to study a group of firms representing a considerable portion of European capital markets, and to investigate the effects of competition variation across several industries. We believe the European setting is ideal for our study, given (i) the absence of a regulation on APMs, (ii) the fact that capital markets are less developed there than in the US, and (iii) the recent publication of a set of guidelines for the disclosure of APMs by the European Securities and Markets Authority published (ESMA, 2015).

Previous studies show that managers disclose APMs more frequently when GAAP figures do not meet certain earnings benchmarks (Black & Christensen, 2009; Lougee & Marquardt, 2004; Walker & Louvari, 2003). These studies assess the frequency of the APM signal and the capital market determinants of issuing the signal. In contrast we focus on the *strength* of the signal (i.e. the under- or overstatement of the APM, when compared to accounting earnings) and on the relative effect of capital markets incentives and industry competition in the magnitude of the signal. We assess whether managers increase the signal strength to persuade investors that firm performance is above the expected performance targets. We test and find that when accounting earnings: (i) fall short of analysts' forecasts of earnings, (ii) are lower than prior year earnings, and (iii) are negative (loss), managers voluntarily disclose APMs

more positively in press releases. Our findings confirm that capital market provide incentives for management strategic disclosure of performance information.

Information models proposed by Grossman (1981) and Milgrom (1981) suggest that firms have incentives to reveal their true performance, as long as costs of disclosure are negligible and information is verifiable. However, disclosing private information is not costless: deliberately communicating positive information about the firm's performance can reveal proprietary information to competitors, which may result in rent extraction. On the other hand, competition can induce disclosure as a way to signal the firm's superiority and keep rivals at bay, or as a way to supply credibility to private information (Darrough and Stoughton 1990; Gigler, 1994; Li 2010). We add to that line of study by showing a positive relation between the value of alternative performance measures disclosed voluntarily in press releases and two types of proprietary costs: costs associated with industry concentration and industry-adjusted profit margins. Thus, when competition from existent industry rivals increases managers disclose APMs more positively, after controlling for capital market incentives and several firm-level characteristics. We find no supportive evidence that set-up costs are associated with the value of the APMs disclosed. Our findings highlight that industry competition is a multifaceted phenomenon (Raith 2003) and its effect on strategic disclosure is specific of the each dimension.

Signaling theory establishes that efficient signals need to be observable and costly. Given the existence of a cost, some firms will be in a better position that others to bear it, i.e. only the high quality firms will signal their superior performance, leading to a separating equilibrium (Spence, 1973). In line with theory, we find that firms with low financial performance report APMs less positively in earnings announcements' press releases than high performing firms, for a certain level of competition. This is

consistent with the premise that low performance firms face higher costs of disclosure than other firms, and thus do not want to risk disclosing an excessive APM.

Our findings bring together and extend the literature of two research areas: strategic management (as a reaction to industry-level competition) and voluntary disclosure of accounting-based measures.

2. Hypotheses development

To obtain funds to finance projects, and ultimately increase shareholder value, firms need to disclose positive performance. However, such disclosure may also inform competitors and thus harm the firm's future profits (Verrecchia, 2001). We propose that signaling theory explains how firms deal with this dilemma. We study the particular case of voluntary disclosure of APMs in earnings announcements' press releases. These indicators can be used by management to give a positive image of firm performance, and thus strengthen the performance signal conveyed by the earnings number included in the financial statements.

APMs are management-made indicators of financial performance, obtained by excluding certain items (mostly expenses, arguably not related to future performance) from accounting earnings. Contrary to accounting earnings, which follow accounting rules and are monitored by auditors and regulators, APMs enjoy large discretion in terms of calculation and communication. The growing practice of disclosing APMs in earnings announcements' press releases has attracted criticism from regulators and from the media that portrays APMs as "voodoo metrics" used by firms "to polish reality as if they were selling second-hand cars" (The Economist, 2016, 30th April). However, studies on investors' reaction to the disclosure of APMs conclude that these measures contain useful information for decision-making (e.g.: Bhattacharya et al.,

2003). We posit that APMs can be a credible signal of the firms' unobservable performance, if some firms are better abled than others to absorb the costs of signaling (Spence 1973, Spence 2002).

Outsiders of the firm lack information about the true financial performance of the business, but would benefit from obtaining it. For example, investors can earn higher returns from buying stock of firms that signal superior future performance. Insiders, on the other hand, possess positive and negative information about the firm's performance and decide if and how to disclose it. Signaling theory suggests a strategic choice: firms primarily disclose positive performance to reveal their quality, and the disclosure takes place if the firm perceives it as beneficial (Spence, 1973, Verrecchia, 2001). Benefits arise because disclosure reduces asymmetry of information and agency conflicts (e.g. Healy and Palepu 2001, Zhang and Wiersema 2009, Certo 2003). Capital markets' benefits of disclosure include lower cost of capital (e.g. Lambert, Leuz and Verrecchia, 2007), improved stock liquidity (Leuz and Verrecchia, 2000), favorable conditions in equity issues (e.g. Healy and Palepu, 1995), and increased attention by financial intermediaries (e.g. Francis et al., 1998).

Capital markets also reward firms for good performance. Firms experience high valuations when they meet or beat important performance benchmarks, in particular analyst forecasts, and prior period profits. (Bartov et al., 2002). [2] Conversely, capital

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[2] It is important to include market incentives related to financial analysts, because they are key players in capital markets. As agents that process and disseminate information they create demand for disclosure and increase the observability of the signal (Arya and Mittendorf, 2005). They are also perceived as sophisticated market participants that are capable of separating true signallers from 'cheap talkers', and thus they can provide assurance about the credibility of the signal to other economic agents (Frankel and Li, 2004)

markets react negatively when a firm misses its earnings targets, even if by a small amount (e.g., Barton and Simko, 2002; Skinner and Sloan, 2002).[3]

Given benefits of disclosure and the market's appetite for performance, firms have incentives to disclose APMs that are higher than accounting earnings to signal high performance. In other words, managers use alternative performance measures to strengthen the performance signal. As APMs are not audited or regulated (in Europe), firms can cherry-pick expenses to exclude from accounting earnings in order to inflate the APM. Hence, we expect that when capital markets incentives are high (i.e. the risk of missing important performance benchmarks is high) firms communicate more positive APMs in relation to their accounting earnings measure. Our first hypothesis is as follows:

H1: Firms disclose APMs more positively when capital markets incentives are high

The seminal work of Grossman (1981) and Milgrom (1981) proposes that the signaler's disclosure preferences are a monotonic function of the receiver's actions, and thus in equilibrium the signaler always reveals its type. Firms with good performance disclose information to separate themselves from their peers, while firms with bad performance disclose because the absence of news will generate pessimistic interpretations.[4]

However, deliberately communicating positive information about the firm's performance may attract not only investors but also competitors. Competitors can use the signal to predict future profitability and take actions to erode the firm's competitive

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[3] A striking example is: in early 2005 eBay reported that it had missed fourth-quarter 2004 consensus estimate by just one penny and saw its share price plunge 22 percent (McKinsey&Company, 2013)

[4] See also Boot and Thakor (2001) and Verrecchia (2001) on voluntary full-disclosure incentives.

advantage (proprietary costs of disclosure). This 'two-receiver' problem leads to partial disclosure. Partial disclosure occurs because the firm wants to signal high performance to capital markets to reduce information asymmetry, but it also wants to convince its competitors that performance is low to prevent competitors' extracting the firm's profits (e.g.: Verrecchia, 1983; Bhattacharya and Ritter, 1983; Darrough and Stoughton, 1990; Wagenhofer, 1990; Feltham and Xi, 1992; Newman and Sansig 1993).

A number of studies have tested the relation between proprietary costs of disclosure and corporate disclosure practices using measures of industry competition. However, the extant evidence is inconclusive. For example, Verrecchia and Weber (2006) find that firms operating in more competitive industries are more likely to hide information, and Li (2010) shows that in more competitive environments firms are less likely to provide management forecasts. On the other hand Botosan and Stanford (2005) show that in high competitive industries firms are more willing to disclose information about profitable business segments. In a similar vein Pacheco-de-Almeida and Zemsky (2012) concludes that revealing proprietary information about innovations may be an effective way to alleviate competitive pressure.

In Darrough and Stoughton (1990)'s model the partial disclosure equilibrium is a function of the entry costs to an industry. When entry costs are low firms increase disclosure to signal their superior performance to deter new entrants. Gigler (1994) also proposes that proprietary costs increases voluntary disclosure by generating credibility for management signals. Managers want to overstate performance signals to obtain capital markets benefits, but because voluntary information is not audited the signal needs to be credible. The proprietary costs of signaling supply that credibility to management disclosures. In our context, if firms use APMs to signal superior performance to competitors then we expect that:

H2: Firms disclose APMs more positively when industry competition is higher

For the performance signal to be effective it needs to be observable and costly (Connelly et al., 2011). The existence of signaling costs leads to a separating equilibrium because some firms are in a better position than others to bear the costs. In Gigler (1994)'s model, disclosure of private information gives credibility to the signal if information is both positive and true. For example, firms disclose more segment information when segments with high performance have more permanent earnings (Hayes and Lundholm, 1996). Firms with high quality board and management teams disclose their teams' background when they have superior skills (Certo, 2003; Zhang and Wiersman, 2009).

In our setting, we expect a firm with a good and true signal (good performance) to disclose higher APMs to distinguish itself from its peers. Conversely, firms with relatively bad performance will lower APMs, as the false signal may induce the entrance of new competitors or overproduction by existing competitors (reducing the firm's income even further). In other words, the cost of disclosing dishonest signals are too high for the low performing types. Furthermore, the bad publicity of APM disclosures in the media can induce scrutiny of such indicators. If a firm is discovered reporting misleading APMs, regulators may investigate them and superior-performance competitors can engage in actions to extract the firm's profits. Lying about financial performance will also negatively affect the firm and manager reputation (Barton and Mercer, 2005; Basdeo et al., 2006). Thus we predict that in the presence of capital markets incentives:

H3: In high competition environments low performing firms disclose less positive APMs than high performing firms.

3. Research design

Our hypotheses test the association between how positively firms disclose APMs and (i) capital markets incentives, (ii) competition, (iii) and performance, in order assess if markets see the disclosure of these measure as a signal. We refer to how positively the measures are disclosed as *APM_SIGNAL*. The general form of our full model is as follows:

$$APM\_SIGNAL_{i,t}$$

$$= \alpha_0 + \alpha_1 \sum CapitalMark_{i,t} + \alpha_2 Competition_{j,t}$$

$$+ \alpha_3 LowPerformance_{i,t} + \alpha_4 LowPerformance_{i,t} * Competition_{j,t}$$

$$+ \alpha_5 \sum FirmControls_{i,t} + \alpha_6 \sum Country\ f.e.$$

$$+ \alpha_7 \sum Time\ f.e. + \varepsilon_{i,t}$$

APM_SIGNAL is calculated as the difference between the alternative performance earnings measure (APM), disclosed in the earnings announcement, and the accounting earnings reported in the financial statements for firm *i* in year *t*, scaled by price at beginning of the year.[5] To improve identification we add country fixed

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[5] Ideally we would isolate managers' adjustments that are done opportunistically to boast users' perception of firm performance. Given that managers' intentions are unobservable, the cases where managers exclude revenues (which lead to alternative performance measures lower than accounting earnings) work against us, as they diminish the probability of finding the predicted results.

effects and time fixed effect. These effects should absorb unrelated time trends and country-specific events. [6]

Capital market incentives

Our first hypothesis states that firms disclose APMs more positively when capital markets incentives are high. We consider three earnings benchmarks that are crucial in capital markets: (i) financial analysts' expectations, (ii) prior year performance (in terms of accounting earnings), and (iii) showing profit. Previous studies show that the disclosure of APMs is strongly associated with missing any of the three benchmarks (e.g.: Isidro and Marques, 2015; Black and Christensen, 2009). We extend those studies by analyzing the *value* of APMs instead of just the decision to disclose APMs. We create three variables to measure the capital markets incentives: *Earnings below expectations, Earnings below prior earnings, and Earnings below profit*. All are indicator variables, coded as one when accounting earnings are below the benchmark, and zero otherwise.

Industry competition

Hypothesis 2 predicts firms disclose APMs more positively when industry competition is higher. Prior work suggests that product market competition is multidimensional and that its impact on voluntary disclosure is dependent on the type of competition (Raith, 2003; Karuna,, 2007, Li, 2010; Dedman and Lennox, 2009). Hence, we study three measures of competition: *industry concentration*, *price-cost margin* (product substitutability), and *competition from potential entrants*. The

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[6] Industry fixed effects are also included in tests of H1. Tests of H2 and H3 include the competition variables which are industry-specific.

variables are computed for year t and industry j (two-digit SIC industry classification), and are defined so that higher values indicate higher competition.

Industry concentration, which captures competition from existing rivals, has been measured in a number of ways (Harris, 1998; Karuna 2007; Hou and Robinson, 2006). To capture the different perspectives of concentration we obtain the principal component of the following variables: (i) the Herfindhal-Hirschman index, calculated as the sum of the squared market shares of sales of all firms in the industry, (ii) the four-firm concentration ratio, calculated as the proportion of the market share of sales in an industry accounted for the four largest firms (in terms of sales), and (iii) market size, calculated as the number of firms in the industry.[7] Industry concentration measures require industry membership to be explicitly defined, making it difficult to capture competition deriving from potential entrants and firms outside the industry. Thus, other dimensions of competition should be analyzed.

The second dimension we study is the price-cost margin, defined as the firm's ratio of sales to operating costs relative to the industry. The price-cost measure directly examines the relation between factor input and output prices. It reflects product substitutability, or the ability of the firm to earn rents above the industry competitors, due to lack of substitute products or successful marketing strategies. We calculate *Profit margin* as the firm's price-cost margin minus industry price-cost margin divided by the standard-deviation of the industry price-cost margin.

The third dimension of competition we analyze is the one that comes from potential entrants. We measure this dimension by the set-up costs a new firm needs to

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[7] A large number of firms indicates more competition, whereas higher concentration of sales indicates lower competition. To facilitate interpretation of the results we multiply the HH and four-firm sales by minus one so that all variables represent high level of competition (i.e. low concentration). We then extracted one principal component (only one component has an eigenvalue higher than one). That component, that we refer as 'industry concentration' explains about 76% of the variation in the three measures.

incur to operate at the same level as the firms in the industry. *Set-up costs* is calculated as the natural logarithm of weighted average of capital expenditures of all firms in the industry, where capital expenditure is measured as the ratio of capital expenditures to total assets. The firm's market share (the ratio of the firm's sales to industry sales) is used as weight.

Performance

Hypothesis 3 predicts that in high competition environments low performing firms disclose less positive APMs than high performing firms. To test the hypothesis we include in the model, alternatively, the interaction terms between the three competition measures and *Low performance. Low performance* is an indicator variable, coded as one when the firm's profitability (return on assets - ROA) is in the bottom 10% of the industry, and zero otherwise.

Firm-level controls

We add several firm-level variables related with the voluntary disclosure of APMs. The first is *Prior year APM_SIGNAL*, which aims to control for the possibility of persistence in the way firms calculate their APMs measures, i.e. an APM firm-style. If this persistence exists, the estimated coefficient for this variable will be positive.[8] Next, we consider some variables that have been identified in the literature as determinants of APMs disclosure (e.g.: Lougee and Marquardt, 2004; Marques, 2006; Jennings and Marques, 2009). These are:

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[8] In the cases where no APM was disclosed in the prior year, this variables is coded as zero.

(i)   *ROA volatility,* calculated as the three-year standard deviation of return on assets, which represents volatility in earnings and is positively associated with the disclosure of APMs;

(ii)   *Special items,* which is an indicator variable coded as one when the firm reports special, extraordinary, or restructuring items, and zero otherwise. Prior work shows that managers are more likely to disclose alternative indicators of performance when the business is involved in one-time extraordinary events such as restructurings because the exclusion of these expenses better reflects recurrent performance;

(iii)   *Institutional ownership*, calculated as the percentage of shares held by institutional holders. This should be negatively associated with the demand for voluntary disclosure of APMs. Institutional investors are sophisticated agents capable of understanding and processing financial information that often have privileged access to private information. Institutional investors play also a monitoring role; their presence may reduce managers' opportunistic disclosure of overoptimistic APMs;

(iv)   *Leverage,* calculated as debt to total assets, represents the importance of debt contracting in management disclosure decisions. Debt contract conditions and creditor monitoring is likely to increase the pressure to achieve high performance. Hence we expect a positive association with the *APM_SIGNAL*;

(v)   *Size,* calculated as the natural logarithm of total assets. Typically large firms have a larger investor basis and a more important position in the industry. We anticipate a positive relation between size and positive APM disclose.

4. Sample and descriptive results

Our initial sample comprises all industrial firms included in the Financial Times 2006 classification of the 500 largest European companies. This sample allows us to study a group of firms with substantial variation in industry competition and that represents a considerable portion of European capital markets.

Our main source of data is the earnings announcement press releases, for fiscal years 2003-2011. We analyze the APMs disclosed in earnings announcement' press releases. Managers make great use of press releases to communicate voluntary information because press releases increase the message observability as they are widely used by the business community, and because they offer great discretion in terms of content and style (e.g.: Huang et al., 2004). From the press releases we hand-collect information on the disclosure of APMs, which are categorized as: (i) alternative earnings per share, (ii) alternative earnings per share from continuing operations, (iii) alternative net income, (iv) alternative income from continuing operations, and (v) alternative EBITDA and EBIT. This unique dataset allows us to know exactly which measures were disclosed by managers, instead of relying of proxies for the value of APMs, as some previous papers have done (e.g: Bradsahw and Sloan, 2002). Given the quality of the data, we expect to have inferences of higher validity.

We merge the hand-collected APM information with financial data from Thomson Reuters Worldscope (financial and price data), FacSet (institutional ownership), and IBES (analyst forecasts). Our final sample comprises 2,339 observations representing 315 firms from 21 countries.

The absence of regulation on voluntary disclosure APMs makes it relevant to investigate the European setting.[9] Contrary to the US, where the Securities and Exchange Commission issued Regulation G establishing stringent rules on disclosure of APMs and has launched investigations into abusive APM disclosure practices, in Europe there are only disclosure guidelines. The European Securities and Markets Authority (ESMA) published recently a set of guidelines for the disclosure of APMs (ESMA, 2015). The aim is to encourage European issuers to publish "transparent, unbiased and comparable information on their financial performance in order to provide users a comprehensive understanding of their performance." However, the guidelines are not mandatory and ESMA has no enforcement power. In October 2005, the predecessor of ESMA, the Committee of European Securities Regulators (CESR), has issued similar guidelines, but most European firms have not implemented those recommendations. The European Financial Reporting Advisory Group (EFRAG), an organization that provides the European Commission with technical advice on accounting matters, conducted a surveyed several large European firms and concluded that the disclosure of APMs by large European firms is inconsistent and obscure (EFRAG, 2009). To sum up, the lack of regulation and monitoring of APM practices gives European firms considerably opportunities for strategic disclosure choices, which allows us to test how capital and product markets shape these choices.

Table 1 presents descriptive statistics and correlations. On average, the APM disclosed in the press release exceeds accounting earnings by 23% of the price of the

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[9] The two exceptions are the UK and France. In the UK, Financial Reporting Standard 3 requires alternative earnings per share figures to be consistent and reconciled with a GAAP figure. However, the standard makes no reference to any other non-GAAP measure. In France, the AMF (*Autorité des Marchés Financiers*) has issued guidelines requesting a reconciliation between non-GAAP and GAAP measures. However, in practice, reconciliations are rare (Aubert, 2010).

stock, or by 28% of the accounting earnings. In monetary terms, the difference between the APM and the accounting earnings is 2.45 Euros, on average.

Accounting earnings fall short of financial analysts' expected earnings in 57% of cases, which may encourage managers to disclosure more positive alternative performance indicators. Accounting earnings are also below prior year earnings in 37% of the cases, and are negative (losses) in 9% of the cases. We observe large cross-industry variation in the measures of industry competition, as indicated by relative large standard deviations. The sample firms report special items in 77% of cases, institutional ownership is 27% on average, and the mean of the debt-to-assets ratio is 26%.

The Pearson correlations between *APM_SIGNAL* and the three variables representing capital market incentives are positive and statistically significant, suggesting that missing earnings benchmarks is associated with larger differences between voluntary APMs and accounting earnings (adjustments made by managers). This is consistent with hypothesis 1. The correlations between *APM_SIGNAL* and the three alternative variables representing product market competition are positive, although one of them is not statistically significant. This suggests higher levels of competition are associated with higher adjustments, and is in line with hypothesis 2. Finally, the correlation between *APM_SIGNAL* and *Low performance* is negative and statistically significant, indicating the firms with lower ROA disclose APMs less positively. This finding is consistent with hypothesis 3.

5. Results

5.1 – Univariate analysis

Table 2 presents the results of two univariate tests. In panel A we test the association between capital market incentives and *APM_SIGNAL,* by presenting the mean value of this variable in several scenarios. Considering three alternative earnings benchmarks, we divide the observations into two groups: cases where accounting earnings are above the benchmark, and cases where they are below the benchmark. Results indicate that when accounting numbers miss analysts' expectations the mean of *APM_SIGNAL* significantly increases, jumping from -0.034 when earnings are above expectations to 0.428 when earnings are below expectations. In other words, managers strengthen the signal of good performance by increasing the value of the APMs voluntarily disclosed. The same strategic behavior is observed for the two other key market benchmarks. The mean value of *APM_SIGNAL* is approximately 77% higher when accounting earnings are less than prior year earnings (than when earnings are above that benchmark), and it increases by 172% when a firm reports an accounting loss (compared to when the firm reports a profit). These findings suggest capital markets provide incentives for firms to use APMs to signal positive performance, which is consistent with hypothesis 1.

In Panel B we divide our observations into two subsamples (high and low competition) based on three alternative competition measures, and compare the mean values of *APM_SIGNAL.* We divide the observations into the two groups based on the sample median. The mean value of *APM_SIGNAL* for the high competition group is significantly higher from the mean of the variable for the low competition group, for two of the competition measures: industry concentration and profit margin. Thus,

management disclose APMs more positively when industry competition is high, which is in line with hypothesis 2.

5.2 – Multivariate analysis

The first column of Table 3 presents the results for the test of H1. As expected, firms disclose APMs more positively when accounting earnings fall below important capital market targets, even after controlling for other factors affecting APM disclosure. This result suggests that when accounting earnings miss capital markets expectations managers try to signal benchmark beating by voluntarily disclosing higher APMs. When accounting performance is below analysts' expected performance *APM_SIGNAL* is 36.4% more positive than when accounting earnings meet or beat analysts' expectations, for every dollar of stock price. When accounting earnings is less that prior year's earnings the difference between the APM disclosed and accounting earnings increases by 7.7%. When the firm reports an accounting loss managers increase the value of APMs by 23.5%.

Moreover, the coefficients estimated for the three benchmarks are statistically different, and the value for analysts' expectations is statistically and economically higher than the value of the coefficients for the other two benchmarks. For example, missing analysts' forecasts is associated with an APM_SIGNAL that is 28.5% larger than the signal for missing last year's earnings. This is consistent with the findings of Brown and Caylor (2005) that currently meeting analysts' expectations is the most important earnings benchmark in capital markets.

Overall, the multivariate results confirm the univariate findings that capital markets provide strong incentives for strategic disclosure of APMs. The coefficient of *Prior year APM_SIGNAL* is positive and statistically significant, indicating that there is

some consistency in the use of APMs across time. The remaining estimated coefficients are generally in line with our predictions, as the difference between the APM disclosed and accounting earnings increases with leverage, size and the presence of special items, decreasing with a stronger presence of institutional investors.

Columns 2 to 4 of Table 4 present the results for the tests of H2, given that we test three alternative measures of competition. We find that proprietary costs, measured by industry concentration and profit margin, are associated with the disclosure of APMs that are of a higher value. Specifically, an increase of one standard deviation in industry concentration results in 3.5% more positive APMs, and an increase of one standard deviation in profit-margin leads to about 2% more positive APMs. Although statistically significant, these effects are economically smaller than the effects of capital market benchmarks. However, capital market incentives and industry competition are complementary forces influencing the strategic disclosure of voluntary performance information, and there is no substitution effect.

The results for set-up costs, reported in the last column of Table 4, suggest that either the threat from potential new firms does not affect APM disclosure practices, or set-up costs are not a good measure of proprietary costs in our setting. It is possible that the decision to enter into a new business is more associated with other factors, such as know-how, human resources, network connections, than with the required fixed capital. Overall, the multivariate results and univariate findings indicate that management increases the value of *APM* when competition from existent rivals is higher, consistent with our second hypothesis.

Table 4 presents the results of testing our third hypothesis. If signaling costs are higher for low performing firms, we expect those firms to disclose APMs less positively than high performing firm, in competitive environments. To test this

prediction we expand the previous model by including the variable *Low performance* and its interaction with the three measures of competition (used alternatively). The coefficients of interest are those of the interaction variable as *Low performance* serves as a firm-level control. For competition measures industry concentration and profit margin the coefficient of the interaction term is negative and statistically significant and of about the same magnitude as the coefficient of the competition variable (although the sum is not statistically equal to zero, as the test at the bottom of Table 4 indicates). Thus, managers of low performing firms disclose APMs less positively, when industry competition is high. We interpret this result as an indication that the costs of dishonest signaling to competitors are too high for low performing firms.

6. Conclusion

Using hand-collected data on the disclosure of APMs by the largest industrial firms in Europe, in this paper we apply signaling theory to explain the relation between the value of these measures (when compared with accounting earnings) and (i) capital markets; incentives and (ii) competition forces. We posit that the value of the APM disclosed can be a credible signal of the firms' unobservable performance, if some firms are better abled than others to absorb the costs of signaling.

We find that the strength of the APM's signal increases with capital markets pressure, i.e. when firms fail to meet their earnings benchmarks with accounting earnings. Moreover, the strength of the signal is positively associated with the level of industry competition. However, firms with lower performance have a different reaction to competitive pressure, and do not disclose APMs positively. We interpret this finding to mean that the costs of dishonest signaling are too high for these firms, even in the presence of competitive pressure.

Our findings bring together and extend the literature of two research areas: strategic management (as firms react to the several dimensions of competition that exist in their industry) and voluntary disclosure of accounting-based measures. By doing so we provide theory to explain the disclosure of these measures, something that was lacking in accounting studies on APMs.

Appendix – Definition of variables

APM_SIGNAL	Difference between the APM disclosed in the annual earnings announcement press release and accounting earnings reported in the financial statements, scaled by price at beginning of the year. Zero when no APM is disclosed.
Capital markets incentives	
Earnings below expectations	Indicator variable, coded as 1 when accounting earnings are below the prior 12 months average analyst consensus forecast of earnings, and 0 otherwise.
Earnings below prior earnings	Indicator variable, coded as 1 when accounting earnings are lower than last year's earnings, and 0 otherwise.
Earnings below profit	Indicator variable coded as 1 when accounting earnings is a loss, and 0 otherwise.
Competition	
Industry concentration	Principal component of (i) Herfindhal index of concentration, (ii) number firms in industry, and (iii) four-ratio concentration. The rule of eigenvalue > 1 suggests just 1 component, which explains 76% of all variation. All measures are calculated by SIC2 and year.
Industry profit margin	The firm's price-cost margin minus industry price-cost margin divided by the standard-deviation of the industry price-cost margin. Calculated by SIC2 and year.
Industry set-up costs	Calculated as the natural logarithm of weighted average of capital expenditures of all firms in the industry, where capital expenditure is measured as the ratio of capital expenditures to total assets. The firm's market share (the ratio of the firm's sales to industry sales) is used as weight.
Low performance	Indicator variable coded as 1 when firm is included in the bottom 10% of the industry, when ranked by ROA and year, and 0 otherwise.

Firm-level controls	
ROA volatility	Calculated as the three-year standard deviation of ROA.
Special items	Indicator variable coded as 1 when the firm reports special, extraordinary, or restructuring items, and 0 otherwise
Institutional ownership	Percentage of share held by institutional holders, from FacSet/LionShares.
Leverage	Calculated as debt divided by total assets.
Size	Calculated as the natural logarithm of total assets.

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Table 1: Descriptive statistics

		Mean	Median	St.dev.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1)	APM_SIGNAL	0.231	0.000	0.669	1									
(2)	Earnings below expectations	0.573	1.000	0.495	0.343*	1								
(3)	Earnings below prior earnings	0.368	0.000	0.482	0.099*	-0.024	1							
(4)	Earnings below profit	0.086	0.000	0.280	0.147*	-0.082*	0.283*	1						
(5)	Industry concentration	-0.014	0.255	1.492	0.093*	0.058*	0.018	0.013	1					
(6)	Industry profit margin	-0.201	-0.053	0.823	0.070*	0.023	0.057*	0.087*	0.061*	1				
(7)	Industry set-up costs	6.718	6.837	1.352	0.013	-0.029	0.000	-0.078*	-0.053*	0.043*	1			
(8)	Low performance	0.101	0.000	0.302	-0.105*	-0.045*	0.249*	0.698*	0.021	0.086*	-0.055*	1		
(9)	ROA volatility	0.032	0.018	0.048	-0.014	-0.087*	0.090*	0.257*	0.056*	-0.012	-0.081*	0.205*	1	
(10)	Special items	0.770	1.000	0.421	0.050*	0.055*	0.049*	0.069*	0.067*	0.064*	0.018	0.083*	0.013	1
(11)	Institutional ownership	0.271	0.264	0.134	-0.131*	-0.009	0.004	0.046*	0.054*	0.066*	-0.105*	0.031	0.032	0.100*
(12)	Leverage	0.267	0.243	0.200	0.119*	0.050*	0.117*	0.120*	0.003	-0.147*	-0.139*	0.113*	0.089*	0.116*
(13)	Size	9.151	9.075	1.221	0.044*	0.019	-0.002	-0.004	-0.057*	0.102*	0.382*	0.023	-0.231*	0.269*

Note: * indicates statistical significance, at a 5% confidence level.

Table 2 – Univariate analysis of *APM_SIGNAL*

Panel A: Capital market incentives

		Expectations	Prior Earnings	Profit
Mean values for:				
Earnings above		-0.034	0.180	0.201
Earnings below		0.428	0.318	0.547
Test of difference	*F value*	*311.24*	*23.61*	*50.62*
	P value	*[<0.001]*	*[<0.001]*	*[<0.001]*

Panel B: Product market competition

		Industry concentration	Industry profit margin	Set-up costs
Mean values for:				
Low competition		0.180	0.149	0.212
High competition		0.283	0.309	0.250
Test of difference	*F value*	*13.83*	*33.83*	*1.89*
	P value	*[<0.001]*	*[<0.001]*	*[0.169]*

Table 3 – Positive APM disclosure and capital market incentives and industry competition

	Market incentives (1)	Industry Concentration (2)	Industry profit margin (3)	Set-up costs (4)
Capital markets incentives				
Earnings below expectations	0.364	0.355	0.357	0.357
	(0.030)	(0.037)	(0.037)	(0.037)
	[0.000]	[0.000]	[0.000]	[0.000]
Earnings below prior earnings	0.077	0.080	0.081	0.083
	(0.017)	(0.030)	(0.030)	(0.030)
	[0.002]	[0.008]	[0.008]	[0.006]
Earnings below profit	0.235	0.231	0.141	0.225
	(0.049)	(0.081)	(0.079)	(0.080)
	[0.001]	[0.005]	[0.076]	[0.005]
Competition		0.024	0.025	-0.017
		(0.008)	(0.010)	(0.013)
		[0.004]	[0.008]	[0.212]
Firm controls				
Prior year APM_SIGNAL	0.378	0.383	0.441	0.387
	(0.072)	(0.054)	(0.056)	(0.055)
	[0.001]	[0.000]	[0.000]	[0.000]
ROA volatility	0.146	0.137	0.421	0.040
	(0.223)	(0.222)	(0.207)	(0.196)
	[0.532]	[0.539]	[0.043]	[0.838]
Special items	0.005	-0.010	0.022	-0.005
	(0.015)	(0.027)	(0.026)	(0.026)
	[0.742]	[0.707]	[0.398]	[0.850]
Institutional ownership	-0.326	-0.356	-0.324	-0.361
	(0.061)	(0.110)	(0.110)	(0.113)
	[0.001]	[0.001]	[0.003]	[0.002]
Leverage	0.141	0.126	0.169	0.109
	(0.045)	(0.074)	(0.097)	(0.071)
	[0.014]	[0.091]	[0.083]	[0.127]
Size	0.004	0.013	0.008	0.020
	(0.003)	(0.012)	(0.013)	(0.012)
	[0.221]	[0.270]	[0.538]	[0.092]
Intercept	0.188	0.102	0.391	0.172
	(0.134)	(0.475)	(0.458)	(0.502)
	[0.200]	[0.830]	[0.394]	[0.732]
Time effects	Yes	Yes	Yes	Yes
Country effects	Yes	Yes	Yes	Yes
Industry effects	Yes	-	-	-
Nr.observations	2,339	2,339	2,339	2,339
Adjusted R^2	0.363	0.362	0.302	0.360

Notes: all variables are defined in the appendix, ( ) include standard-errors, [ ] include p-values.

Table 4: Positive APM disclosure for low and high performing firms

	Industry Concentration	Industry profit margin	Set-up costs
	(1)	(2)	(3)
Capital markets incentives			
Earnings below expectations	0.342	0.354	0.355
	(0.036)	(0.037)	(0.037)
	[0.000]	[0.000]	[0.000]
Earnings below prior earnings	0.083	0.077	0.078
	(0.028)	(0.030)	(0.031)
	[0.003]	[0.011]	[0.011]
Earnings below profit	0.281	0.198	0.193
	(0.099)	(0.086)	(0.086)
	[0.005]	[0.022]	[0.026]
Competition	0.027	0.030	-0.016
	(0.008)	(0.013)	(0.013)
	[0.001]	[0.021]	[0.194]
Low performance	-0.071	0.144	0.399
	(0.065)	(0.099)	(0.454)
	[0.276]	[0.149]	[0.380]
Competition x Low performance	-0.048	-0.034	-0.037
	(0.024)	(0.168)	(0.065)
	[0.049]	[0.043]	[0.566]
Firm controls			
Prior year APM_SIGNAL	0.410	0.381	0.385
	(0.057)	(0.054)	(0.054)
	[0.000]	[0.000]	[0.000]
ROA volatility	0.165	0.056	0.031
	(0.204)	(0.214)	(0.197)
	[0.420]	[0.796]	[0.873]
Special items	-0.007	-0.009	-0.006
	(0.026)	(0.026)	(0.025)
	[0.792]	[0.719]	[0.803]
Institutional ownership	-0.480	-0.332	-0.354
	(0.105)	(0.107)	(0.112)
	[0.000]	[0.002]	[0.002]
Leverage	0.138	0.134	0.103
	(0.082)	(0.068)	(0.069)
	[0.093]	[0.050]	[0.135]
Size	0.017	0.012	0.021
	(0.012)	(0.012)	(0.012)
	[0.159]	[0.331]	[0.083]

Intercept	-0.151	0.114	0.163
	(0.117)	(0.497)	(0.498)
	[0.199]	[0.819]	[0.744]
Test (Competition + LowPerformance x Competition) = 0			
P-value	0.365	0.089	0.431
Time effects	Yes	Yes	Yes
Country effects	Yes	Yes	Yes
Nr.observations	2,339	2,339	2,339
Adjusted R^2	0.352	0.363	0.361

Notes: all variables are defined in the appendix, ( ) include standard-errors, [ ] include p-values.