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# Marketing performance measurement and firm performance

## Evidence from the European high-technology sector

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### Abstract

**Purpose** – The research aims to test whether the ability to measure marketing performance affects the actual performance of firms, in the context of the European high-tech sector. It also aims to test whether performance-reporting frequency and size of marketing budget mediate the relationship between measurement ability and performance.

**Design/methodology/approach** – Survey responses collected from 157 marketers were supplemented with firm performance data.

**Findings** – Results show that marketing performance measurement ability positively impacts firm performance and that reporting frequency mediates this relationship.

**Research limitations/implications** – More attention should be given to the activities that are measured rather than the metrics in use – which receive much attention in the literature. Current interest in marketing dashboards may be overstated.

**Practical implications** – Enhanced ability to account for marketing leads not only to improved firm performance, but also to greater regard for marketing at the senior management level.

**Originality/value** – This is the first study to demonstrate a link between marketing performance measurement ability or frequency and firm performance in the European market. It also provides an insight into the chain of effects linking marketing performance measurement ability to firm performance.

**Keywords** Marketing strategy, Performance measures, Product technology, Europe

**Paper type** Research paper

### Introduction

Marketing performance measurement (MPM) continues to be a large and growing concern for marketing scholars and managers alike. Questions related to marketing productivity and performance assessment rank consistently among the top research priorities of the Marketing Science Institute (MSI, 2002, 2004); current MSI priorities for 2006-2008 include the question of how to connect marketing metrics with marketing strategy, and, by implication, firm performance (MSI, 2006). Academic interest in MPM is largely based on the assumption that greater marketing accountability enhances

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firm performance and marketing's stature (e.g., Rust, Ambler, Carpenter, Kumar and Srivastava, 2004). However, researchers have given little attention to testing these relationships. Instead research has tended to focus on techniques for measuring marketing productivity (e.g., Morgan *et al.*, 2002) and approaches to measuring brand and customer equity and identifying metrics in use (e.g., Barwise and Farley, 2004).

One study to date (O'Sullivan and Abela, 2007) has demonstrated a positive relationship between the ability to measure marketing performance, and actual firm performance. The purpose of the current study is to examine whether, given that significant variations exist in marketing practices in different geographic contexts (e.g., Singh *et al.*, 2005), the relationship between MPM ability and firm performance demonstrated in O'Sullivan and Abela (2007) can also be shown among European firms. In addition, while that study assumed that performance reporting frequency and marketing budget mediated the relationship between MPM ability and firm performance, we subject these assumptions to empirical testing.

Our study focuses on marketers in European high-tech firms. Interest in MPM is particularly apparent in the high-tech sector, where senior executive demands for marketing accountability are acute (IDC, 2003; ITSMA, 2003). Two primary factors contribute to heightened pressure for marketing accountability in this sector. First, high-tech firms typically have an engineering rather than a marketing/market driven orientation. This is most evidently reflected in executive scepticism towards the value of marketing in these firms (Meldrum, 1995; Ward *et al.*, 1999). Second, the collapse of the technology boom of the late 1990s led to intense scrutiny of the necessity for, and the value of, marketing (Mohr and Shooshtari, 2003). Marketers within European high tech firms, similar to those in North America, struggle to meet the accountability demands of senior management and their influence over the senior executive team tends to be weak (CMO Council, 2005).

Marketing performance measurement is the assessment of "the relationship between marketing activities and business performance" (Clark and Ambler, 2001, p. 231). While evidence continues to mount that investments in marketing activities contribute to increases in shareholder wealth (e.g., Rao and Bharadwaj, 2008), demonstrating this link in the case of specific firms continues to be an elusive challenge. Reflecting this, marketing managers, face an unabated demand to show greater accountability for their own specific marketing investments. In turn, this has led marketers to display an almost insatiable appetite for marketing metrics and other measurement data (Doyle, 2000; Morgan *et al.*, 2002; Kumar, 2004; Lehmann, 2004; Webster *et al.*, 2005).

Following O'Sullivan and Abela (2007), since the challenge faced by marketers is their inability to demonstrate the effectiveness of marketing activities, our focus in this paper is on marketing's ability to assess the relationship between those activities and firm performance. Also, since the interest of marketing managers is to demonstrate the value of their marketing activities, we focus on marketing not as the "underlying products, pricing, or customer relationships" (Rust, Ambler, Carpenter, Kumar and Srivastava, 2004, p. 76) but instead as the "marketing activities" themselves, defined as marketing communication, promotion, and other activities that consume most of the typical marketing budget (O'Sullivan and Abela, 2007).

Ironically, demonstrating the link between investment in marketing and firm performance itself requires further investment (Bonoma and Clark, 1988). Is such an investment justifiable? O'Sullivan and Abela (2007) demonstrate a link between the ability to measure marketing performance and actual firm performance. Replicating and extending this study in a European context is the purpose of this article.

## Conceptual development and hypotheses

We present the conceptual model for our study in Figure 1.

We follow the theoretical framework and hypotheses developed in O'Sullivan and Abela (2007), which link MPM ability to firm performance and CEO satisfaction with marketing. The first hypothesis is that MPM ability has an effect on actual firm performance. Greater marketing accountability is commonly assumed to lead to superior marketing and firm performance (e.g., Rust, Ambler, Carpenter, Kumar and Srivastava, 2004). Previously, marketing scholars have argued that MPM improves decision making and ultimately performance (e.g., Morgan *et al.*, 2002; Ambler *et al.*, 2004). Accordingly, we examine the relationship between MPM ability and firm performance through the following hypothesis:

*H1*. Ability to measure marketing performance positively influences firm performance.

Many marketing scholars contend that the availability of measures to communicate marketing's contribution to firm performance enhances marketing's influence and stature (e.g., Lehmann, 2004; Seggie *et al.*, 2007). Indeed, Webster *et al.* (2005) describe greater ability to account for marketing's contribution as being central to the discipline regaining its "seat at the table". We test this view through the following hypothesis:

*H2*. Ability to measure marketing performance is positively associated with CEO satisfaction with marketing.

Previous studies of MPM have tended to focus either on issues of which activities to measure (e.g., Rust, Lemon and Zeithaml, 2004) or the measurements in use (e.g., Ambler *et al.*, 2004; Lages *et al.*, 2005). O'Sullivan and Abela (2007) hypothesised that these are two distinct aspects of MPM ability. Hereafter we refer to these two aspects of

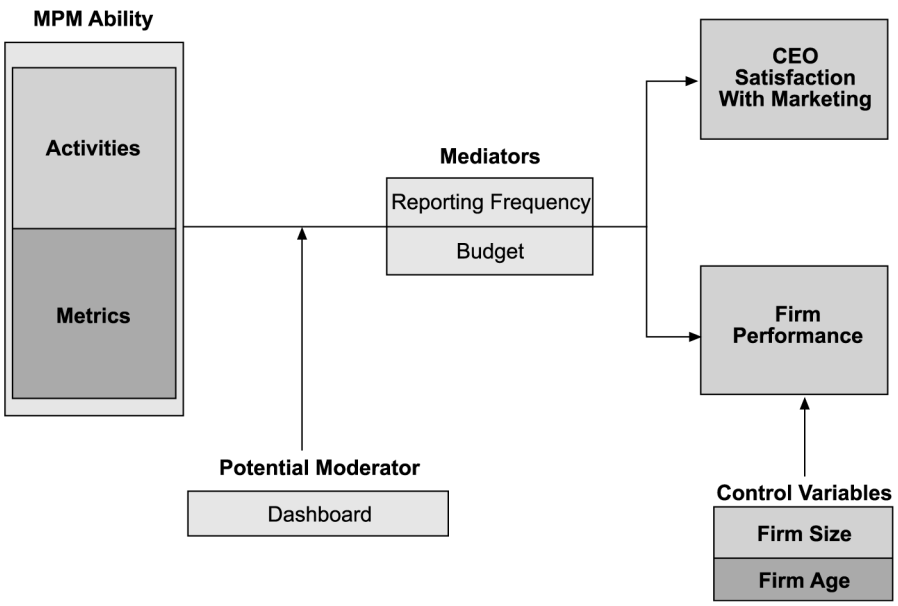


**Figure 1.**
Conceptual model

MPM as "activities" and "metrics" respectively. Activities is defined as the ability to measure performance across a range of marketing activities. Metrics is defined as the ability to assess marketing performance using a comprehensive set of metrics (financial and non-financial, in relation to goals, and in relation to competitors). Both are critical: the first because of the wide range of marketing activities that make up the typical marketing plan, and the second because any single metric is not insufficient for assessing marketing performance (Ambler and Roberts, 2006).

We hypothesise that the activities and the metrics aspects of MPM have separate but related effects on both firm performance and CEO satisfaction. Consistent with the earlier study we test the impact of the activities aspect first:

*H3*. Ability to measure performance across the range of marketing activities employed positively influences firm performance.

*H4*. Ability to measure performance across the range of marketing activities employed is positively associated with CEO satisfaction with marketing.

Within the marketing literature, it is commonly recognised that measurement of performance necessitates the use of both financial and non-financial metrics (Clark, 1999). In their recent article Rust, Ambler *et al.*(2004) provide an overview of the need for non-financial measures to assess marketing performance. Reflecting the view, that an expansive set of measures enhances accountability, and the recent work of Verhoef and Leeflang (2008), we expect to find a positive relationship between metrics and both firm performance and CEO satisfaction with marketing:

*H5*. Ability to provide a comprehensive set of metrics positively influences firm performance.

*H6*. Ability to provide a comprehensive set of metrics is positively associated with CEO satisfaction with marketing.

Marketing performance dashboards, which have received considerable managerial attention in recent years, are seen as means by which information is summarised and communicated to senior management (McGovern *et al.*, 2004; Miller and Cioffi, 2004). Ambler (2003) argues that this improved visibility leads to greater trust in marketing, improved marketing investments and superior firm performance. Accordingly, in the current study we hypothesise that use of marketing dashboards mediates the key relationships:

*H7*. The greater the use of a marketing dashboard, the more positively marketing performance measurement will influence firm performance and be associated with CEO satisfaction with marketing.

Prior studies also provide empirical evidence of a relationship between the formalisation of the marketing planning process and the attainment of improved performance (e.g., Lysonski and Pecotich, 1992). This is consistent with the theorised link between the measurement of marketing performance and improved firm performance (Rust, Ambler, Carpenter, Kumar and Srivastava, 2004). O'Sullivan and Abela (2007) offer two potential explanations for the effect of MPM ability on firm performance in their study. First, they argue that the ability to measure marketing performance leads to and is approximately equal to actual measurement and reporting of performance, on the assumption that – given the aforementioned pressures for

greater accountability facing marketers – it is unlikely that those possessing the ability would let any of it lie latent. Second, consistent with Webster *et al.* (2005) they argue that marketers are more likely to secure and defend budgetary resources when they can clearly demonstrate a contribution to firm performance.

That said, neither of these two routes (actual measurement/reporting of performance and budgetary resources) through which MPM ability is proposed to impact on firm performance and marketing's stature were empirically tested by O'Sullivan and Abela (2007). We therefore extend their original study by testing both of these assumptions. Although the assumption that no marketer would leave any measurement ability unutilised appears to us to be a strong one, we nevertheless examine whether the relationship between MPM ability and firm performance is mediated by actual measurement and reporting efforts. We conceptualise these efforts in terms of frequency of marketing performance reporting. We also examine whether the amount of resources that the marketing function is able to secure – specifically the size of the marketing budget – mediates the relationship between MPM ability and firm performance. Thus the first additional hypothesis is:

*H8.* Marketing performance reporting frequency will mediate the relationship between MPM ability and both firm performance and CEO satisfaction with marketing.

Aaker and Jacobson (1994a, b) contend that where assets are harder to measure they tend to be under resourced. The corollary has also been argued, with a number of authors pointing to the need to develop metrics as a means of assisting marketers in securing, defending and growing marketing budgets (e.g., Rust, Ambler, Carpenter, Kumar and Srivastava, 2004; Srivastava *et al.*, 1998). Similarly, Merlo *et al.* (2003) suggest that the level of resources allocated to marketing is determined by the degree to which marketing activities are perceived to impact on firm performance. The perceived impact of marketing is, in turn, dependant on the availability of clear and credible measures of whether and to what extent marketing impacts on performance (Ambler, 2003). Accordingly, we expect that MPM ability will positively influence willingness of senior management to allocate resources to marketing. Additionally, the degree to which resources are allocated to marketing is, in turn, recognised as a determinant of firm performance (Ambler, 2003). Consequently, in our model, resources allocated to marketing are identified as a potential mediator of the key relationships:

*H9.* The marketing budget will mediate the relationship between MPM ability and both firm performance and CEO satisfaction with marketing.

The study controls for firm size and age since both of these variables have previously been shown to impact on performance (e.g., Ahuja and Lampert, 2001; Miles *et al.*, 2000). We control for firm age as it influences performance and competitive advantage outcomes (Zahra *et al.*, 2000).

## Method

### *Measures*

*Independent variables*. MPM ability was operationalised as the simple average of each firm's scores on the two dimensions of activities and metrics, following O'Sullivan and Abela (2007). The activities dimension was operationalised as the simple mean of a 12-item construct, each item representing a different class of marketing activities,

including above- and below-the-line promotional activities as well as marketing planning and customer relationship management activities[1]. The ability to measure each activity was assessed on a seven-point scale, anchored by "poor" and "excellent." The metrics dimension was operationalised as the mean response to four-items (use of financial and non-financial measures, benchmarking vs plan and vs competition), each again captured on a seven-point scale anchored by "poor" and "excellent."

*Dependent variables*. Our choice of dependent measures (firm performance and CEO satisfaction with marketing) and their specific operationalisation again followed O'Sullivan and Abela (2007). Firm performance was assessed using both primary (survey) and secondary (datastream) data. Primary data included sales and profit, while secondary data included return on assets (ROA) and stock returns. For ROA and stock returns, time lagged data was captured, to enable us to determine the direction of causality between MPM ability and performance.

*Mediating variables*. As noted above, while O'Sullivan and Abela (2007) assume that the relationship between MPM ability and firm performance is mediated by actual measurement and by marketing budget size. We attempt to test these two assumptions. To do so, actual measurement was operationalised as frequency of marketing performance reporting, measured as the summed mean of the frequency with which respondents reported the performance of nine aspects of marketing to senior management. The nine items, which are presented in the Appendix, were developed to reflect the aspects of marketing's contribution to firm performance that are commonly reported in high tech firms. The items were identified in exploratory discussions with senior marketers. We captured responses on a five-point response scale developed by Ambler *et al.* (2004). Marketing budget size was measured as a percentage of each firm's annual revenue committed to marketing.

Our two control variables were firm size and age. To prevent skewness, we measured firm size as the log of annual revenue.

To test for comprehension, relevance, and completeness the questionnaire was piloted with ten senior marketers in European high-tech firms. Participants in the pilot phase were asked to identify any problems encountered with the e-mail invitation, the content of the questionnaire or the process of completing it online. Participants were also asked to evaluate the clarity of the questions and the response formats. Feedback from the pilot phase indicated that the questionnaire was suitable for a European sample. For example, participants uniformly understood CEO satisfaction with marketing as relating to the marketing function as opposed to a firm orientation (Narver and Slater, 1990) or pan-company activity (Ambler, 2003). Also, no problems were encountered with regard to understandings of the function and features of marketing dashboards.

*Sample and procedure*

We used the membership list of the European Chapter of the Chief Marketing Officers (CMO) Council as the sample frame for our study. The CMO Council is a not-for-profit organisation for senior marketers in high-tech firms and a survey of the North American members provided a basis for O'Sullivan and Abela's (2007) study. Our decision to use a similar sample frame, albeit in a new context (Europe), is consistent with accepted best practice in initial replications (e.g., Lindsay and Ehrenberg, 1993).

We divided the questionnaire into four sections containing questions relating to marketing performance measurement capabilities, marketing performance reporting practices, firm performance and respondent profile. The questionnaire included the

12-item scale to quantify ability to measure performance across a range of marketing activities and the four-item scale to quantify ability to assess performance using a comprehensive set of metrics. It also contained a nine-item scale to measure performance reporting frequency.

We administered the survey online between February and March 2005. A total of 445 senior marketers received e-mail notification of the survey. This was followed 14 days later by a reminder e-mail to non-respondents. Each e-mail contained an embedded link to the questionnaire. Total usable response was 157 representing a response rate of 35.28 per cent. This response rate was highly satisfactory given that rates ranging from 12 per cent to 20 per cent are considered acceptable for cross sectional samples (Churchill, 1991). Following Armstrong and Overton (1977) we tested for non-response bias using time-trend analysis. Results from analysis of two sub samples drawn from early and late respondents did not differ in terms of respondent profile or the variables of interest. Consequently, we concluded that non-response bias was not a significant concern.

The job titles of respondents represented the range of possible senior marketer titles: 8 per cent were chief marketing officers, 21 per cent were vice presidents of marketing or communications, and 33 per cent were directors of marketing. Of the 38 per cent who answered "Other," most were senior managers with titles such as Vice President of Brand Communications and Product Marketing Director. Similar to the original study, respondent firms were drawn from a cross section of high-tech related sectors including software providers, systems integrators, internet services and components.

*Measure purification*

Factor analysis indicates the activities variable has a similar four-component structure to that identified previously. Consistent with prior research (Washburn and Plank, 2002; Mitchell and Walsh, 2004), a factor loading of 0.4 was set as the cut off to establish themes and labels for the factors. In deciding which items would be used to compute a "factor score", Bedford's criterion of a primary loading at least 0.2 larger than the next loading was also adopted. One of the items – ability to measure channel marketing, failed both the cross loading and factor loading criteria for inclusion. We present the four factors and their components in Table I:

(1) Direct (direct mail/e-mail, telemarketing and web).

(2) Brand (advertising and brand).

(3) PR (PR, analyst relations, and trade shows).

(4) MGT (CRM, research and budgeting).

Table II presents descriptive statistics and a correlation matrix for the variable set. As we expected, metrics and activities are strongly correlated. For all scales, alpha coefficients exceed the cut off of 0.7, indicating acceptable reliability (Nunnally and Bernstein, 1994).

We present results of the tests for discriminant validity in Table III. For each construct average variance extracted (AVE) exceeds the 0.5 level recommended by (Hair *et al.*, 1998). Also, the AVE for each construct is higher than the squared correlation between that construct and any other construct indicating that discriminant validity is not a problem (Fornell and Larcker, 1981).

| | Factor 1 (Direct) | Factor 2 (Brand) | Factor 3 (PR) | Factor 4 (Management) |
|---|---|---|---|---|
| Branding | | 0.819 | | |
| Advertising | | 0.780 | | |
| Direct mail/e-mail campaigns | 0.862 | | | |
| Telemarketing and contact management | 0.768 | | | |
| Web site and internet presence | 0.636 | | | |
| Trade shows and events | | | 0.484 | |
| PR and internal communications | | | 0.612 | |
| Analyst and stakeholder relations | | | 0.654 | |
| Customer relationship management systems | | | | 0.851 |
| Market research | | | | 0.609 |
| Budgeting | | | | 0.636 |

**Table I.**
Factor matrix of MPM activities

**Note:** All but the highest loadings are suppressed; Extraction method: principal component analysis; Rotation method: varimax with Kaiser normalisation

## Analysis and results

We first considered the relationship between MPM ability and both firm performance and CEO satisfaction with marketing by analysing the primary data.

### *Firm performance: primary data*

In *H1* and *H2* we predicted a positive relationship between MPM ability and both firm performance and CEO satisfaction with marketing. We tested these hypotheses using hierarchical moderated regression models (Schoonhoven, 1981). Reflecting our conceptual model, and to test *H7*, we first considered the potential moderating effect of marketing dashboards on the relationship between MPM and the dependent variables. We specified two equations, one for each dependent variable. We entered data into the equations in two steps. Step 1 contained the main effects associated with MPM, the potential moderator and in testing the relationship with firm performance, the two control variables. Step 2 contained the interactions defined by mean centring the main effects and creating products of dashboard and MPM. Mean centring allowed us to control for the effect of multicoliniarity (Aiken and West, 1993). The interaction term had an insignificant effect on firm performance and CEO satisfaction with marketing (for performance, change in $F(1, 149) = 0.783$, n.s. and for CEO satisfaction with marketing, change in $F(1, 149) = 4.526$, ns). Given these results, we re-estimated the model including MPM and in the case of firm performance, the two control variables. Results are reported in Table IV.

Consistent with the earlier study, MPM ability is, as hypothesised, significantly associated with both firm performance and CEO satisfaction with marketing. Therefore, both *H1* and *H2* are supported by the primary data.

*H3-H6* predict that activities and metrics, the two components of MPM, will each have an impact on firm performance and CEO satisfaction with marketing. To test these set of hypotheses, we again began by examining the interaction effects of both activities and dashboard and metrics and dashboard. As entry of the interaction effects did not explain a significant level of variance (for firm performance, change in $F(2, 146) = 0.283$, ns and for CEO satisfaction with marketing, change in $F(2, 147) = 2.387$, ns) we report a model containing the predictor variables only. Table V, part A provides

| | Mean | SD | Items | Activities | Metrics | Dashboard | Reporting frequency | Marketing budget | CEO satisfaction | Performance | Firm age | Firm size |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Activities | 3.88 | 0.82 | 4 | *0.771* | | | | | | | | |
| Metrics | 3.31 | 1.00 | 4 | 0.617 | *0.831* | | | | | | | |
| Dashboard | 2.99 | 1.60 | 3 | 0.475 | 0.584 | *0.841* | | | | | | |
| Reporting frequency | 3.11 | 0.74 | 4 | 0.391 | 0.364 | 0.402 | *0.794* | | | | | |
| Marketing budget | 2.04 | 1.13 | 1 | 0.255 | 0.317 | 0.274 | 0.052 | | | | | |
| CEO satisfaction | 3.29 | 0.88 | 1 | 0.370 | 0.379 | 0.241 | 0.222 | 0.237 | | | | |
| Performance | 4.60 | 1.24 | 3 | 0.329 | 0.286 | 0.148 | 0.407 | 0.05 | 0.181 | *0.806* | | |
| Firm age | 13.37 | 6.70 | 1 | −0.017 | −0.029 | 0.084 | 0.075 | −0.249 | −0.081 | 0.092 | | |
| Firm size | 4.42 | 2.32 | 1 | 0.084 | 0.053 | 0.187 | 0.084 | −0.147 | 0.075 | 0.08 | 0.413 | |

**Table II.**
Correlation matrix

| | Average variance extracted | Squared correlations | | | | |
|---|---|---|---|---|---|---|
| | | Activities | Metrics | Dashboard | Reporting frequency | Performance |
| Activities | 0.60 | | | | | |
| Metrics | 0.67 | 0.38 | | | | |
| Dashboard | 0.73 | 0.23 | 0.34 | | | |
| Reporting frequency | 0.66 | 0.15 | 0.13 | 0.16 | | |
| Performance | 0.72 | 0.11 | 0.06 | 0.02 | 0.17 | |

**Table III.**
Discriminant validity

**Note:** Alpha for multi-item measures is in italics on the diagonal in the correlation matrix

| | Primary data | | | | Secondary data | | | |
|---|---|---|---|---|---|---|---|---|
| | Firm performance | | CEO satisfaction | | ROA | | Stock returns | |
| *Model statistics* | | | | | | | | |
| Adjusted $R^2$ | 0.105 | | 0.168 | | 0.083 | | 0.085 | |
| *F*-statistic | 7.070 | | 31.909 | | 3.045 | | 2.791 | |
| df | 3,152 | | 1,152 | | 3,65 | | 3,55 | |
| *p*-value | $<0.001$ | | $<0.001$ | | $<0.05$ | | $<0.05$ | |
| *Final predictors* | *b* [a] | *t* [b] | *b* | *t* | *b* [a] | *t* [b] | *b* | *t* |
| MPM | 0.336 | (4.401)*** | 0.417 | (5.649)*** | 0.355 | (2.99)** | 3.12 | (2.44)* |
| Firm size[c] | 0.013 | (0.151) | | | −0.10 | (−0.80) | −0.001 | (−0.011) |
| Firm age[c] | 0.094 | (1.128) | | | 0.111 | (0.921) | −0.143 | (−1.114) |

**Table IV.**
The impact of MPM on firm performance and CEO satisfaction

**Notes:** [a] Standardised coefficients; [b] *t* refers to the *t*-statistic for the estimated coefficients; [c] Firm size and age are not included as control variables in considering the impact on CEO satisfaction with marketing as there is no firm basis in theory that would cause us to expect these two variables to impact on the dependent variable; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

the results of this analysis. Next, we tested the relationship between our predictor variables and our dependent variables. We entered the data in three steps, thereby isolating the impact of metrics over and above the impact of activities. We entered the control variable in step 1. We entered activities and considered the extent to which this explained a significant amount of variance. Finally, we entered metrics to examine the extent to which it explained additional variance.

As activities has a positive impact on both firm performance and CEO satisfaction with marketing, *H3* and *H4* are supported. The entry of metrics into the equation has a significant impact on CEO satisfaction with marketing but not on performance. Consequently, *H5* is rejected and *H6* is supported by the primary data.

To examine further the impact of the activities factors, we calculated the regression coefficients for each factor on each dependent variable. We present the results of this analysis in Table V, Part B.

As again the interaction effects were not significant, the table reports the main effects of the four activities factors, metrics and the two control variables. A three-step hierarchical regression was undertaken. For firm performance, the entry of the Direct factor to the model with firm size and age explained a significant level of additional variance (change in $F(1, 150) = 7.640$, $p < 0.01$). Subsequent entry of metrics to this

| Model statistics | Firm performance | | CEO satisfaction | | ROA | | Stock returns | |
|---|---|---|---|---|---|---|---|---|
| *A: Activities and metrics* | | | | | | | | |
| Adjusted $R^2$ | 0.101 | | 0.163 | | 0.077 | | 0.089 | |
| *F*-statistic | 6.78 | | 15.86 | | 2.88 | | 2.89 | |
| df | 3,152 | | 2,151 | | 3,65 | | 3,55 | |
| *p*-value | $<0.001$ | | $<0.001$ | | $<0.05$ | | $<0.05$ | |
| | *b* | *t* | *b* | *t* | *b* | *t* | *b* | *t* |
| Activities | 0.329 | 4.302*** | 0.220 | 2.340* | 0.344 | 2.909** | 0.315 | 2.503* |
| Metrics | | | 0.244 | 2.600** | | | | |
| Firm size | 0.014 | 0.164 | | | 0.000 | −0.001 | 0.007 | 0.056 |
| Firm age | 0.092 | 1.102 | | | 0.099 | 0.825 | −0.162 | −1.275 |
| *B: Activities factors* | | | | | | | | |
| Adjusted $R^2$ | 0.087 | | 0.172 | | 0.064 | | 0.066 | |
| *F*-statistic | 4.659 | | 11.568 | | 2.538 | | 2.032 | |
| df | 4,150 | | 3,150 | | 2,65 | | 4,54 | |
| *p*-value | $<0.001$ | | $<0.001$ | | $<0.05$ | | $<0.05$ | |
| | *b* [a] | *t* [b] | *b* | *t* | *b* | *t* | *b* | *t* |
| Direct | 0.014 | (142) | 0.145 | (1.879) | | | | |
| MGT | | | | | | | 0.192 | (0.013) |
| PR | | | | | | | | |
| Brand | | | 0.151 | (1.978)* | | | | |
| Metrics | 2.46 | (3.041)** | 0.296 | (3.747)*** | 0.329 | (2.721)** | 0.149 | (0.874) |
| Firm size | 0.023 | (0.226) | | | 0.001 | (0.009) | 0.002 | (0.013) |
| Firm age | 0.088 | (1.035) | | | 0.108 | (0.878) | −1.30 | (−0.991) |

**Notes:** [a] Standardised coefficients; [b] *t* refers to the *t*-statistic for the estimated coefficients; [c] Firm size and age are not included as control variables in considering the impact on CEO satisfaction with marketing as there is no firm basis in theory that would cause us to expect these two variables to impact on the dependent variable; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

**Table V.**
The impact of activities and metrics on firm performance

model also provided a significant level of additional variance (change in $F(1, 149) = 8.593$, $p < 0.01$).

For CEO satisfaction with marketing, two of the four factors explain a significant level of variance: Direct (change in $F(1, 151) = 11.824$, $p < 0.001$) and PR (change in $F(1, 150) = 7.573$, $p < 0.001$). Entry of metrics to this model again explained significant additional variance (change in $F(1, 149) = 13.432$, $p = 0.001$).

*Firm performance: secondary data*

To supplement the subjective data on firm performance gathered from respondents, we also collected objective performance data on firm profitability and stock returns for the subsequent 12 months. This approach has been recommended as a means of counterbalancing the problems that arise in interpreting causality based solely cross sectional correlational studies (Rust *et al.*, 2002). Our objective measures were ROA and size-adjusted stock returns. ROA was collected from the DataStream database. Size adjusted returns we calculated using monthly stock returns data. As our analysis of objective performance data was limited to publicly held firms, our sample size was reduced (69 for ROA and 59 for stock returns compared with 157 for the primary analysis).

In this phase of the analysis, we followed the same process undertaken for the primary data. First, the potential moderating impact of dashboards on the relationship between MPM ability and performance was considered. Again, we used a hierarchical moderated regression. For both measures of performance, the entry of the interaction effects failed to generate a significant level of variance (for ROA change in $F(1, 63) = 0.077$, $p =$ ns, for stock returns change in $F(1, 53) = 0.584$, $p =$ ns). Reflecting this, we present results containing MPM ability and the two control variables in Table IV.

As MPM ability has a significant impact on both ROA and on stock returns, *H1* is supported. This is consistent with our analysis of the primary data and findings from O'Sullivan and Abela (2007).

Next, we considered the relationship between returns and the two components of MPM – activities and metrics, and the two objective performance measures – ROA and stock returns. We first examined the interaction effects of both activities and dashboard and of metrics and dashboard. As neither interaction effect explained significant additional variance in ROA or stock returns, we report the main effects only in Table V, Part A.

As activities and metrics are conceptually related, we carried out a three-step hierarchical regression. We entered firm size and age into the model in step 1. In step 2, we entered activities. In the third and final step, we entered metrics to establish whether it explained further variance.

Activities has a positive impact on both ROA and stock returns, further supporting *H3*. Consistent with our analysis of the primary data, dashboards are not found to have a significant moderating effect. Consequently, we reject *H7*.

Next, we analysed the impact of the activities factors. We present results from this analysis in Table V, Part B. The entry of each of the activities factors to the model with the two control variables failed to explain a significant level of additional variance in ROA. However, metrics did have a significant impact on the model (change in $F(1, 64) = 7.406$, $p < 0.01$). Entry of the MGT factor to the model with firm size and age explained significant variance in stock returns (change in $F(1, 55) = 5.053$, $p < 0.05$), but entry of metrics to this model failed to explain a significant level of additional variance.

*Mediators*

Extending O'Sullivan and Abela (2007), we tested for the mediating influence of two variables: performance reporting frequency, and marketing budget. Collectively, the following three conditions are taken as an indication of the presence of a mediating variable (Barron and Kenny, 1986). First, the independent variable is significantly associated with the dependent variable. Second, the hypothesised mediating variable is significantly associated with the dependent variable. Third, the independent variable is not significantly related to the dependent variable in the presence of the mediating variable. Where both the independent and mediating variables are significantly associated with the independent variable this is taken as an indication of partial mediation. We present our tests of mediation in Table VI.

The mediating effect of performance reporting frequency is supported for ROA. The significance levels of the beta coefficient for MPM in the presence of performance reporting frequency indicates that reporting frequency partially mediates the relationship between MPM ability and subjectively measured performance. We find no mediating effect of reporting frequency on the MPM ability-stock returns relationship. The mediating effect of reporting frequency on the MPM ability-CEO satisfaction relationship is also not supported.

| Mediator variable | Dependent variable | MPM → DV $b$ [a] | $t$ [b] | MPM → mediator $b$ | MPM → mediator $t$ | Mediator → DV (MPM included) $b$ | Mediator → DV (MPM included) $t$ | MPM → DV (Mediator included) $b$ | MPM → DV (Mediator included) $t$ |
|---|---|---|---|---|---|---|---|---|---|
| Performance reporting frequency | Performance | 0.336 | 4.401*** | 0.419 | 5.701*** | 0.317 | 3.922*** | 0.203 | 2.512* |
| Performance reporting frequency | ROA | 0.355 | 2.990** | 0.419 | 5.701*** | 0.390 | 2.982** | 0.147 | 1.112 |
| Performance reporting frequency | Stock returns | 0.312 | 2.448* | 0.419 | 5.701*** | 0.161 | 0.990 | 0.213 | 1.316 |
| Performance reporting frequency | CEO satisfaction | 0.417 | 5.649*** | 0.419 | 5.701*** | 0.058 | 0.716 | 0.396 | 4.856*** |
| Budget | Performance | 0.336 | 4.401*** | 0.320 | 4.167*** | −0.045 | −0.542 | 0.365 | 4.505*** |
| Budget | ROA | 0.355 | 2.990** | 0.320 | 4.167*** | −0.088 | −0.684 | 0.420 | 3.382*** |
| Budget | Stock returns | 0.312 | 2.448* | 0.320 | 4.167*** | 0.113 | 0.802 | 0.278 | 2.060* |
| Budget | CEO satisfaction | 0.417 | 5.649*** | 0.320 | 4.167*** | 0.111 | 1.425 | 0.384 | 4.927*** |

**Notes:** [a] Standardised coefficients; [b] $t$ refers to the $t$-statistic for the estimated coefficients; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

**Table VI.**
Testing the mediation of the MPM ability firm performance/CEO satisfaction relationships

*H9* is not supported. The mediating effect of budget is not supported for any of the three performance measures or for CEO satisfaction. While marketing budget is correlated with activities and with metrics (see Table II), the relationships do not hold when the full model is tested. Also, budget is correlated with CEO satisfaction with marketing. However, we find no evidence to support the hypothesised mediating influence of marketing budget on the relationship between MPM ability and CEO satisfaction with marketing. On the basis of the results, we reject *H9*.

## Discussion

The first purpose of our study was to attempt to replicate the findings of O'Sullivan and Abela (2007) in a new setting – the European high-tech sector. Our replication confirms the main findings of the original study: the positive relationship between MPM ability and both firm performance (objectively and subjectively measured) and CEO satisfaction with marketing. This is an important result. While the O'Sullivan and Abela (2007) findings can arguably be attributed to the peculiarities of the research context, our findings indicate that the results are robust and applicable to firms in the European high-tech sector. The four-factor structure of the activities construct is also confirmed by the European data. Consistent with the earlier study, when the two sub-components of MPM are considered, we find that metrics does not have an impact on the dependent variables over and above the impact of activities. In light of these findings, it seems appropriate to refocus attention on the activities measured rather than the metrics in use.

Dashboards do not moderate the relationship between MPM ability and either firm performance or marketing's stature. This finding contributes to a growing body of research (e.g., Clark *et al.*, 2006) suggesting that current managerial interest in marketing dashboards may be overstated.

Our results support the influence of one of the two mediating factors considered. We find that marketing performance reporting frequency mediates the relationship between MPM ability and objectively measured performance and partially mediates the relationship with subjectively measured performance. These findings lend support to two related assumptions in the original study. Namely, that those firms with an ability to measure marketing performance utilise the ability and that performance reporting leads ultimately to an improvement in overall firm performance. The mediating effect of marketing budget on the relationship between MPM and the dependent variables is not supported. It would appear that greater ability to account for marketing does not lead to a greater allocation of marketing resources. Given these results, it would be interesting to explore the link between ability and performance through a consideration of other potential mediators and other measures of performance.

### *Research implications and limitations*

This study offers additional support for the implications of O'Sullivan and Abela (2007) and provides some new implications for marketing managers in high-tech firms.

Marketers, particularly those in high-tech firms, are under intense pressure to communicate marketing's contribution and as a means of securing top management support. Findings from the current study indicate that, for European high-tech firms, enhanced MPM ability has an impact on firm performance and CEO satisfaction with marketing. While measurement of marketing performance is complex, our results highlight the merits of developing a measurement competency.

Our findings indicate that managers should measure and report on a comprehensive set of marketing activities. The current study, taken in conjunction with earlier findings from the North American market, point to a list of activities that can usefully be focused on by marketers in high-tech firms. The results also point to the need to focus primarily on what is measured rather than on range metrics in use, or the adoption of performance dashboards.

An additional implication of this study derives from the mediating role of performance reporting frequency. Our findings suggest that firms leverage their MPM ability to engage in more frequent reporting of marketing performance and that this, in turn, leads to improved firm performance.

While this research overcomes a limitation of the O'Sullivan and Abela (2007) study, by including a consideration of performance reporting practices, and not just MPM ability, it does share some of the other limitations. Specifically, the study is again, by design, limited to the high-tech sector. The sample frame for the study – the membership list of the CMO Council – is not a complete list of senior high-tech marketers in the geography encompassed by this study, Europe. While the four-item dashboard scale reflects the existing literature, this literature is in its infancy and further work would be useful here. Finally, CEO satisfaction with marketing is captured on a single item scale, while single item scales have received renewed interest (e.g., Bergkvist and Rossiter, 2007), a larger battery of measures would have been preferable. However, these limitations are the result of maintaining a consistent sample frame and research instrument, which is recommended practice for first replications (e.g., Lindsay and Ehrenberg, 1993). In addition, taken together, the two studies provide an insight into MPM within the North American and European high-tech sectors.

Similar to prior research, we build on the assumption that measurement leads to improved performance (Clark *et al.*, 2006). We shed light on the link between MPM ability and firm performance, by linking ability to performance reporting frequency. However much remains to be done to explore the chain of effects that lead from greater marketing accountability to improved firm performance. While there is strong empirical support for this relationship between measurement, learning and performance outcomes, we do not test these relationships directly.

We assess firm performance using both objective and subjective measures. However, we rely entirely on senior marketers as key informants in assessing other factors in the study. Future studies might usefully test our findings though the inclusion of other senior mangers in, for example, the assessment of MPM ability and or marketing's stature within the firm.

This is one of the first studies to consider the use of marketing dashboards. The scope and function of marketing dashboards continues to evolve and our finding with respect to the moderating role of dashboards needs to be considered with caution.

## Note

1. The scale items were developed by O'Sullivan and Abela (2007) based on a review of the literature and exploratory interviews with senior marketers in high-tech firms which focused on itentifying activities under the control of the marketing function.

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## Appendix. Measures

*Ability to measure marketing activities*

*For each of the following marketing activities please rate your company's ability to measure performance (1 = poor, 7 = excellent).*

- Branding.
- Direct mail/e-mail campaigns.
- Web site and internet presence.
- PR and internal communications.
- Channel marketing.

- Market research.
- Advertising.
- Telemarketing and contact management.
- Tradeshows and events.
- Analyst and stakeholder relations.
- CRM systems.
- Budgeting.

*Ability to generate a comprehensive set of marketing metrics*
*Please rate your company's current ability to provide the following MPM information (1 = poor, 7 = excellent).*

- Financial indicators of marketing performance.
- Non-financial indicators of marketing performance.
- Benchmark indicators of marketing performance against plans.
- Benchmark indicators of marketing performance against competitors.

*Primary firm performance outcomes*
*Please indicate your firm's performance over the last year relative to all other competitors in the primary market that you serve (1 = very poor, 7 = outstanding).*

- Sales growth.
- Market share.
- Profitability.

*Secondary firm performance outcomes*

- ROA (COMPUSTAT).
- Size-adjusted Stock Returns.

*CEO satisfaction with marketing*
*In your opinion, what is your CEO's evaluation of your company's current marketing performance?*

- Excellent.
- Above average.
- Average.
- Below average.
- Poor.

*Use of a marketing dashboard*
*Please rate your company's current ability to provide the following MPM information (1 = poor, 7 = excellent).*

- High level "dashboard" of key marketing performance indicators.
- Automated reporting of performance from the full range of marketing activities.
- Automated "drill-down" information for detailed analysis of individual marketing programs.

*Marketing performance reporting frequency scale items*
*Considering the following measures, how frequently are they reported to senior management? (1 = monthly or more, 5 = never).*

- Qualified leads generated.
- Number of campaign leads converted.
- Brand equity measures.
- Press coverage and analyst influence.
- Web site traffic and content viewing.
- Share of mind and share of discussion audits.
- Customer retention, loyalty and satisfaction.
- Benchmarking surveys and perception studies.
- Competitive intelligence tracking.

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