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Do not settle for simple assessment: the effects of marketing metric uses on market-sensing capability

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Abstract

Purpose – Despite the availability of many metrics and tools for marketing performance measurement, the way in which firms use their marketing metrics remains underexplored. This study aims to address this gap by empirically establishing the differing effects of the diagnostic and interactive uses of marketing metrics on firms' market-sensing capability, contingent on competitive intensity and focus on market-related metrics.

Design/methodology/approach – This study builds on survey data collected from 210 Irish-based firms, complemented by 21 in-depth interviews with business managers. Survey data are analysed using regression analysis.

Findings – This study finds that firms using marketing metrics interactively to communicate organizational focus are better able to sense their markets, especially under high competition. The authors observe a positive impact of the interactive use of metrics on market-sensing capability, but a U-shaped impact of their diagnostic use, the magnitudes of which further depend on competitive intensity and firms' focus on market-related metrics.

Research limitations/implications – This study provides a nuanced view of marketing performance measurement (MPM) practices within firms, particularly focussing on diagnostic versus interactive uses of marketing metrics. It also sheds further light on how two diverse uses of marketing metrics – diagnostic and interactive uses – influence a firm's market-sensing capability. Moreover, the identification of boundary conditions also contributes to the discussion of contextuality in MPM, highlighting the importance of aligning a firm's uses of marketing metrics with its business environment.

Practical implications – This study provides novel insights into how diverse uses of marketing metrics may benefit firms. The differing effects of diagnostic and interactive uses of marketing metrics on market

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sensing highlight a primary need for developing the latter and for using the former only with caution. It establishes that all firms would equally benefit from an interactive use of marketing metrics that is pivotal to improving their ability to anticipate, detect and sense market changes.

Originality/value – This study provides novel understanding of the role of marketing metric uses in firms' market-sensing capability and contributes to the discussion of contextuality in marketing performance measurement. It highlights the importance of aligning a firm's use of marketing metrics with its business environment.

Keywords Diagnostic use of marketing metrics, Interactive use of marketing metrics, Market-sensing capability, Competitive intensity, Focus on market-related metrics

Paper type Research paper

> Marketers use performance metrics in the same way that a drunk uses lamp posts – for support rather than illumination (after Andrew Lang).

1. Introduction

Marketing performance measurement (MPM), the use of financial or nonfinancial metrics to quantify the contributions of the marketing function, remains a top research priority and attracts constant interest from marketers and scholars [Mintz *et al.*, 2021a, 2021b; Morgan *et al.*, 2022; Marketing Science Institute (MSI), 2020]. The recent CMO Survey (2021) reveals that pressure to prove the impact of marketing efforts has increased recently, with 58.7% of marketing leaders reporting increased pressure from CEOs and 45.1% from CFOs. Extant studies in the field of MPM include those addressing technicalities of measurement (e.g. the comprehensiveness of MPM, Homburg *et al.*, 2012), reporting (O'Sullivan *et al.*, 2009), linking individual marketing metrics to business outcomes (Mintz and Currim, 2013, 2015), as well as the contextuality of MPM (Frösén *et al.*, 2013, 2016). However, few studies have examined how the various ways in which firms use marketing metrics may lead to different outcomes (for notable exceptions, see Liang and Gao, 2020; Mintz *et al.*, 2021b; Nath, 2020). Not surprisingly, scholars have highlighted the need for a deeper understanding of how marketing metrics can be used to guide marketing strategies (Morgan *et al.*, 2022), inform marketing-mix decisions (Mintz *et al.*, 2021a, 2021b), enhance marketing capabilities (Liang and Gao, 2020) and drive marketing excellence (Moorman and Day, 2016). This study aims to contribute to this deeper understanding of firms' uses of marketing metrics by demonstrating how their uses are associated with improvements in market-sensing capability.

Firms' capability to make sense of their markets has never been so important, as they seek to overcome marketing challenges compounded by the recent pandemic (Du *et al.*, 2021; Moorman, 2020). Market-sensing capability denotes a firm's ability to sense, detect and anticipate changes in customer preferences, competitor activities and wider market conditions (Bouguerra *et al.*, 2021). It represents a "second-order" dynamic capability (Lichtenthaler and Lichtenthaler, 2009) that fosters organizational learning through determining which and how market information is generated, absorbed and fed into a firm's dynamic capabilities (Day, 2011). Examples of firms excelling in market sensing from various industries and nations, such as Procter and Gamble (the USA), Tesco (the UK) and IKEA (Sweden), all highlight capabilities in analysing customer-, competitor- and market-related data to provide an early warning of market changes and alter operations as crucial to their success (The CMO Survey, 2021; Reeves and Deimler, 2011). Taking Tesco as an example, this groceries and general merchandise retailer constantly collects consumer data via its loyalty card program and conducts detailed analyses of consumer purchases to gain early warning of changes in consumer behaviours. Its strong market-sensing

capability allows Tesco stores to customize their offerings and make operational adjustments in a timely manner (Reeves and Deimler, 2011).

The development of market-sensing capability depends on market information (Bouguerra *et al.*, 2021). Firms may use their marketing metrics as a vehicle to develop market-sensing capability through the generation of valuable market insights for decision making (Homburg *et al.*, 2012). For instance, marketing metrics can be used *diagnostically* to help firms to collect performance feedback or *interactively* to identify marketing areas that need special attention (Rust *et al.*, 2004). Despite these clear benefits, the pertinence of marketing metrics in facilitating market-sensing capability has largely been omitted in the literature. To these ends, we pose the following research question: *What is the* role *of marketing metric uses in fostering market-sensing capability (RQ1)*? Here, we define the use of marketing metrics as the utilization of marketing metrics as part of an MPM system in order to assess, monitor, control and communicate how marketing resources are allocated and marketing strategies are implemented to achieve the desired goals of a firm (Liang and Gao, 2020; Rust *et al.*, 2004).

It has been noted that the effectiveness of many managerial practices (e.g. performance measurement practices) depends on the external environment in which a firm operates (Chenhall, 2003). While significant progress has been made in relation to the understanding of contingencies determining the design and features of MPM practices (Frösén *et al.*, 2013; Mintz and Currim, 2013, 2015; Mintz *et al.*, 2021a, 2021b), only a handful of studies demonstrate contingencies in the MPM-performance relationships. Some contingencies identified include market orientation (Frösén *et al.*, 2016; Nath, 2020), marketing controls (Krush *et al.*, 2016) and business strategies (Homburg *et al.*, 2012). Nevertheless, the moderated effects of MPM on performance/market-sensing capability remain under-explored, and Nath (2020) identifies a pressing need for more research on contingencies that affect the effectiveness of MPM. To this end, we ask a second research question: *How do external and internal contingencies moderate the impact of marketing metric uses on market-sensing capability (RQ2)*?

By addressing these research questions, our study makes four important contributions. First, our study provides new insights into the *various ways in which firms use marketing metrics* in practice by unravelling the practical differences between firms' diagnostic and interactive uses of marketing metrics. Second, while the existing literature has mainly focussed on individual metrics and their impact on decision-making, our study extends this stream of the literature by unravelling the differing impacts of their diagnostic and interactive uses on market-sensing capability. Third, the study is among the first to investigate the contingency effects of both external and internal factors on the relationship between the uses of marketing metrics and market-sensing capability. Such investigation extends our current understanding of the contextuality of MPM practices. Fourth, our study also provides valuable empirical evidence about how firms, in practice, adopt individual marketing metrics for different purposes, highlighting the importance of employing the appropriate metrics to reap the full benefits of MPM systems.

2. Theoretical background and hypothesis development

2.1 Marketing performance measurement and the uses of marketing metrics

MPM is an organizational process that uses marketing metrics to acquire feedback on a firm's marketing performance and to offer guidelines regarding the implementation of marketing strategies and/or individual activities (Rust *et al.*, 2004). Given that marketing performance feedback can be an important form of market information (Clark *et al.*, 2006), MPM is proved to be a vital vehicle for organizational learning (Liang and Frösén, 2020) and has been shown to have (in)direct implications for marketing and firm performance (Table 1). As Table 1 illustrates, a majority of the extant studies in the field has focussed on

Table 1. Selected empirical studies on the effectiveness of MPM

Studies	Characteristics of MPM: Individual metrics	MPM system	Uses of metrics/MPM	Contingencies	
Mintz *et al.* (2021b)	✓		✓		Customer mindset-related metrics are most effective in making marketing-mix decisions, while financial metrics are least effective
Liang and Gao (2020)		✓	✓		MPM comprehensiveness drives a firm's architectural marketing capability, and thereby performance, while the diagnostic and interactive uses of MPM pose different impacts on marketing capabilities and firm performance
Nath (2020)	✓		✓	Market orientation and long-term orientation	While financial metrics discourage market exploration, market and long-term orientation strengthen (weaken) the positive (negative) impact of marketing (financial) metrics on market exploration
Frösén *et al.* (2016)	✓	✓		Market orientation, firm size and strategy	Marketing metrics and market orientation interact to drive firm performance. Such effect is further moderated by firm size and strategy types
Krush *et al.* (2016)		✓		Centralization and formalization	Marketing dashboard drives marketing performance through strategy implementation and market information management. Such effect is moderated negatively by centralization but positively by formalization
Mintz and Currim (2015)	✓		✓		Marketing and financial metric uses are positively related to marketing activity performance
Frösén *et al.* (2013)	✓	✓			How firms weigh different aspects of marketing metrics can influence their financial performance: firms collecting a broad set of marketing metrics reap more benefit than others
Homburg et al.(2012)		✓		Differentiation, marketing complexity, and market dynamism	Marketing alignment and market knowledge mediate the impact of MPM on firm performance. However, this mediation effect is moderated by marketing strategy, market dynamism, and marketing complexity
O'Sullivan *et al.* (2009)		✓			A firm's MPM ability positively affects its firm performance through reporting frequency

(*continued*)

Table 1.

Studies	Characteristics of MPM: Individual metrics	MPM system	Uses of metrics/MPM	Contingencies	
O'Sullivan and Abela (2007)		✓		The use of dashboard (not significant)	A firm's MPM ability positively affects firm performance. Such effect is not moderated by the use of marketing dashboard
Morgan and Rego (2006)	✓	✓			The use of customers' recommendation intentions and behaviors-related metrics to set goals and monitor performance is misguided
This study	✓	✓	✓	Competitive intensity and focus on market-related metrics	The diagnostic and interactive uses of marketing metrics pose different impacts on market sensing capability, and such impacts are moderated by competitive intensity and focus on market-related metrics

Source: Authors own work

individual marketing metrics and their impact on decision-making and business performance (Mintz and Currim, 2015; Mintz *et al.*, 2021b), pointing to a clear need for research to examine how the different uses of marketing metrics influence capability development, depending on contingency factors (Nath, 2020).

Despite continuous calls for research on marketing performance and metrics, studies that specifically examine the uses of marketing metrics have been very scant (Morgan *et al.*, 2022 for a summary). Among those limited studies, two general streams of research start to emerge. One group of MPM studies examines how metric uses affect marketing-mix decision outcomes in different contexts (Mintz *et al.*, 2021a, 2021b; Mintz and Currim, 2013, 2015). In this research context, metric use is defined as "whether a manager uses a metric, for consideration, benchmarking, monitoring, or assessing a specific marketing-mix decision, by considering the trends or characteristics that individual metrics provide" (Mintz *et al.*, 2021b, p. 34). In studies representing this stream, the use and effectiveness of individual metrics used by marketing managers for specific marketing-mix decisions are empirically assessed.

Another emerging stream of research considers the use of marketing metrics as part of broader management controls over the firm's marketing function (Simons, 1995; Henri, 2006) and explores how the use of marketing metrics influences capability development and performance improvement (Liang and Gao, 2020; Nath, 2020). Drawing on the organization learning perspectives, Clark *et al.* (2006) categorize MPM processes into information generation, dissemination and interpretation, whereas Morgan *et al.* (2005) direct research focus on the usage of customer satisfaction metrics and highlight that firms should generate, analyse, distribute and use their customer satisfaction data to diagnose and optimize customer satisfaction and subsequently business performance. Other studies also empirically confirm the role of MPM in facilitating the generation of market knowledge (Homburg *et al.*, 2012), the management of market information (Krush *et al.*, 2016) and the development of organizational learning capability (Liang and Frösén, 2020). These studies collectively highlight the role of MPM in organizational learning, suggesting that firms can translate their learning from MPM into managerial competences that permit them to take necessary actions and respond to market changes.

While the extent to which firms use marketing metrics in decision-making and the types of metrics used in MPM may differ across firms, marketing metrics are generally used for two purposes: diagnostic and interactive purposes (Liang and Gao, 2020; Simons, 1995). First, the diagnostic use of marketing metrics relates to the collection and usage of performance data primarily for assessment, monitoring and benchmarking purposes (Rust *et al.*, 2004). This is driven by the marketing department's need to justify its contributions and increase its accountability in order to access internal resources for strategy execution (Morgan *et al.*, 2022). Top management sets a multitude of objectives for the marketing department, among which include financial performance (e.g. sales and profitability), consumer mindsets metrics (e.g. awareness and liking) and market-related metrics (e.g. relative price and relative customer satisfaction, see Hanssens and Pauwels, 2016). As such, MPM serves as a diagnostic tool to assess marketing performance, to monitor the progress of marketing activities and to benchmark actual marketing performance against pre-defined goals, previous years' performance, as well as the performance of major competitors (Ambler *et al.*, 2004; Henri, 2006). In general, such use should help firms to detect signals from their markets regarding the outcomes of their marketing activities and take corrective actions when necessary (Frösén *et al.*, 2016; Rust *et al.*, 2004).

Second, performance measurement also serves firms to collect and share marketing insights within the firm and, thereby, provide a basis for continuous improvement (Petersen

et al., 2018; Stewart, 2009) and organizational learning (Arnett and Wittmann, 2014; Henri, 2006; Weerawardena, 2003). This interactive use of marketing metrics helps direct organizational members' attention to crucial market developments as well as shifts in strategic focus, thereby fostering intra- and inter-departmental communications and transparency (Ambler *et al.*, 2004; Stewart, 2009). Additionally, such use may serve as a basis for incentive systems to guide individuals' behaviours (Gebhardt *et al.*, 2006) and/or to signal strategic directions set by top management (Ambler *et al.*, 2004). Using marketing metrics to support inter-organizational communication and decision-making can enhance a firm's resource allocation and, thereby, its financial performance (Gupta and Zeithaml, 2006).

2.2 Impact of the interactive use of marketing metrics on market-sensing capability

Market-sensing capability is based on organizational information processing activities ranging from information gathering, filtering, evaluating and interpreting to utilizing (Bouguerra *et al.*, 2021; Sinkula, 1994). Thus, market learning-related mechanisms, such as the use of marketing metrics, play an important role in developing market-sensing capability (Day, 1994; Weerawardena, 2003). This is because through information processing, firms decode complex, unpredictable and volatile business environments and convert this uncertainty management into a logical risk analysis and opportunity identification process (Day, 2011). With ever increasing marketing data, the ability to generate market insights from seemingly overwhelming data has never been so vital for a firm's growth (Du *et al.*, 2021).

The development of market-sensing capability also requires firms to engage in market information processing activities (Jaworski and Kohli, 1993), which can be fulfilled by the interactive use of marketing metrics. The use of marketing metrics allows firms to shift the focus of their communications onto critical marketing areas and thereby improve their ability to link with and adapt to the market in a timely manner (Liang and Gao, 2020). This enhances firms' ability to detect market opportunities. In addition, firms with a higher level of interactive use of marketing metrics are more likely to communicate key performance insights generated from MPM internally, thus cultivating an information-rich organizational environment (Gebhardt *et al.*, 2006). Information about contingencies and dynamics related to marketing activities and their outcomes, as well as the impact of competitors' activities, is known to enhance market-sensing capability (Hughes *et al.*, 2008). Thus, we hypothesize as follows:

H1. The extent of the interactive use of marketing metrics is positively related to market-sensing capability.

2.3 U-shaped effect of the diagnostic use of marketing metrics on market-sensing capability

MPM allows firms to gain feedback regarding their marketing activities and performance (Rust *et al.*, 2004). Such diagnostic use offers signals that enable firms to adjust processes or inputs in due time when results are below expectations (Frösén *et al.*, 2016), whereas any measurement is likely to be better than none, lower levels of diagnostic use are often characterized by firms' use of only a handful of financial metrics, for the purpose of tight controls over their operations and marketing outcomes (Henri, 2006). This may create two constraints that hinder the development of market-sensing capability. First, the low level of diagnostic use may prompt firms to monitor process efficiency and goal achievements, but seldom focus on competitors' tactics or market changes (Morgan *et al.*, 2005). Consequently,

it may constrain their market orientation (Frösén *et al.*, 2016), and thereby market-sensing capability (Day, 1994). Second, the use of financial metrics for diagnostic purposes only provides some insights into the financial performance of the marketing function, but very limited insights into the market environment. This may disrupt the firm's market scanning and opportunity seeking (Henri, 2006).

Higher levels of diagnostic use often prompt firms to use a wider set of metrics to provide a more holistic and profound understanding of their marketing performance. For instance, as the level of diagnostic use increases, firms often start to expand the selection of marketing metrics to include more market-related and non-financial metrics (Clark, 1999). From an organizational learning perspective, such practice helps firms enrich knowledge of their customers and competitors, which is essential for the development of their market-sensing capability. Analogous to a medical doctor using a variety of observations and tests to come up with the final diagnosis, a firm's use of a wider variety of metrics is likely to provide marketers with more accurate insights of its operations in the markets[1]. Du *et al.* (2021) suggest that firms assessing a wider range of performance data (e.g. internal customer data, market trend data and competition data) are more likely to spot customers' shifting preferences and sense competitive tactics. Moreover, the increased diagnostic use of marketing metrics can help legitimize marketing initiatives and provide timely feedback for strategic adjustment and improvement (Morgan *et al.*, 2022; O'Sullivan and Abela, 2007). This allows firms to better establish the underlying causality between marketing activities and outcomes (Homburg *et al.*, 2012), as well as provides insights that can be particularly valuable in sensing the market and identifying market trends (Morgan *et al.*, 2022). Thus, higher levels of diagnostic use are likely associated with an increasing market-sensing capability. Building on this rationale, we hypothesize the impact of diagnostic use of marketing metrics on market-sensing capability to vary across different levels of diagnostic use:

H2. The extent of the diagnostic use of marketing metrics has a U-shaped effect on market-sensing capability.

2.4 Moderating effect of competitive intensity

Competition prompts organizational learning to help firms cope with continuous market changes and explore market opportunities (Lichtenthaler, 2009; Weerawardena *et al.*, 2006). Gathering market intelligence through the use of marketing metrics is a vital source of environmental information that allows firms to take actions (Sinkula, 1994). Echoing this, Morgan *et al.* (2005) find that competitive intensity, denoting the number of rivals and their competitive actions in a market (Jaworski and Kohli, 1993), is a vital factor affecting the usage of marketing performance information, as well as its implications. As such, we consider competitive intensity as a moderator in the uses-market-sensing capability relationships.

In less competitive environments, consumers only have access to limited product/service choices (Jaworski and Kohli, 1993). The market landscape is relatively stable, resulting in limited need for firms to generate additional market-related insights to enhance their market sensing activities (Weerawardena *et al.*, 2006). In contrast, in an intensively competitive market, firms face a greater need to monitor and respond to their competitors' actions and tactics (Wilden and Gudergan, 2015). Thus, in-depth market insights become more central as a potential source of competitive advantage and the overall usage of marketing metrics to feed into such insights becomes more critical (Mintz and Currim, 2015). Fierce competition can also lead to changes in the market landscape, which, in turn, results in a greater demand

for firms to use marketing metrics to build up knowledge of market dynamics in relation to marketing activities and their outcomes (Du *et al.*, 2021; Homburg *et al.*, 2012). If firms interactively use marketing metrics to generate firm-wide market knowledge and communicate such insights internally, they can enhance organizational learning (Arnett and Wittmann, 2014), and thereby cultivate their ability to anticipate and respond to competitive actions. On the contrary, retrospective performance assessment, characteristic of diagnostic use of marketing metrics, may not be effective in proactively monitoring the market environment (Simons, 1995), leading to poor market-sensing capability. Accordingly, this study hypothesizes as follows:

H3. Competitive intensity (a) positively moderates the impact of the interactive use of marketing metrics but (b) negatively moderates the effect of the diagnostic use of marketing metrics on market-sensing capability.

2.5 Moderating effect of levels of focus on market-related metrics

The use of individual metrics for either diagnostic or interactive purposes is likely to vary across firms (Ambler *et al.*, 2004; Mintz and Currim, 2015). Generally, a firm starts from the use of some financial metrics – such as profits, margins or return on investment (ROI) – to assess the financial outcomes of its marketing activities and their contribution to the overall firm performance (Clark, 1999). This information is essential for addressing the overall success of a firm's marketing, although it provides only limited diagnostic insight for improvement. Gradually, the firm expands the number of metrics it uses in MPM; and metrics focussing on the interface between the firm and its markets (targeting customer attitudes and behaviour as well as the firm's position relative to its rivals) start to gain prominence (Clark, 1999; cf. Mintz and Currim, 2015). The broadening focus allows the firm to further analyse *why* marketing activities succeed or fail to meet expectations through better understanding its markets, as well as helps anticipate changes and develop effective marketing strategies.

Accordingly, we argue that an increase in the firm's focus on market-related metrics is likely to be associated with an overall increase in the variety of metrics in its use (Day, 2011; Fang *et al.*, 2014). This increase, in turn, enhances the impact of the uses of marketing metrics on market-sensing capability, especially in terms of their diagnostic use. This is because systematic collection of a wider set of metrics helps firms not only to keep trace of their financials but also to achieve a superior understanding of customer needs and the competitive landscape (Morgan *et al.*, 2005), which results in a more holistic understanding of the drivers of their performance. Again, analogous to the operations of a medical doctor, a holistic perspective relying on a variety of diverse data points is likely to yield a more accurate assessment (and remedy) than a focus on any single symptom only. Similarly, a holistic perspective on MPM allows the firm to better recognize emergent patterns in its market environment, which improves its strategic decision-making (Gupta and Zeithaml, 2006), particularly through enhancing its market-sensing capability. Following this reasoning, we hypothesize as follows:[2]

H4. The extent of a firm's focus on market-related metrics positively moderates the impact of the (a) interactive and (b) diagnostic uses of marketing metrics on market-sensing capability.

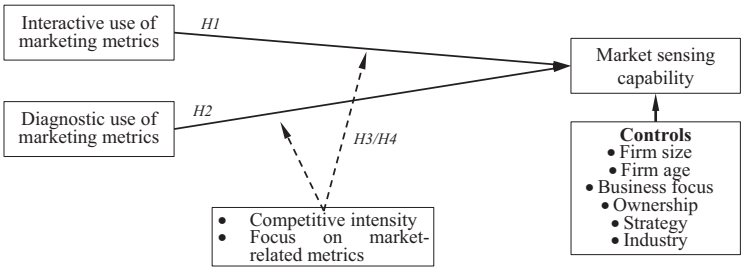
Figure 1 depicts the research model.

3. Research design

This study primarily extends a quantitative research method to test the research model, while also supplementing this quantitative study with qualitative interviews. Interviews were conducted to enhance the understanding of the quantitative results, help provide a more rounded view of the research model and mitigate the risk of method bias (Davis *et al.*, 2011). Data were collected from Irish-based firms. Market sensing, collaboration and adaptability are a priority for Irish firms seeking to cope with the increasing global challenges (Government of Ireland, 2018). Thus, we considered Irish-based firms an appropriate subject to explore how the uses of marketing metrics could influence market-sensing capability.

The Irish Times Top 1000 Companies database served as the main sampling frame. Given that small- and medium-sized enterprises (SMEs) make up an important part of the Irish economy (Central Statistics Office, 2018), we complemented the database with SMEs registered as members of a respected national research institute to better represent the Irish economy. Based on initial contacts with the firms, those with no functional marketing department in Ireland and/or with firm policies preventing participation in research were excluded from the initial mailing list. This process resulted in 870 remaining firms on the list. CEOs, CMOs, marketing managers and other senior managers were identified as key informants for the study, as they are knowledgeable on marketing-related issues and have also been widely used as key informants in strategy research (Li and Calantone, 1998).

To collect the data, a mail-out package including a cover letter, the questionnaire and a pre-paid and pre-addressed envelope was sent out to these firms. In the few cases where respondents requested a soft-copy questionnaire, we sent the survey via Qualtrics, an online survey platform. We followed up with these firms by posting first- and second-round reminder packages, including a reminder letter, a replacement questionnaire and a pre-paid and pre-addressed envelope. This led to a total of 235 responses and a response rate of 27.01%. This response rate is comparable to the average response rate reported by management studies conducted in Ireland (30.29%, see Mellahi and Harris, 2016). Mellahi and Harris (2016) further suggest that response rates are usually lower for organizational-level studies or studies collecting data from managers. Thus, we believe that our response rate is acceptable. To verify the competence of informants, we asked the respondents to rate their knowledge of MPM- and capabilities-related issues on a seven-point Likert scale. A score greater than 5 indicated their competence and reliability as a key informant (Weerawardena *et al.*, 2006). Accordingly, only the answers of respondents with a score of 5



Note: The dotted line represents the moderating effects
Source: Author's own work

Figure 1.
The research model linking the uses of marketing metrics and market-sensing capability

or above were deemed valid and retained for the analysis. This procedure resulted in 210 completed and qualified surveys. On average, the remaining respondents scored 6.18 for their knowledge of MPM-related issues and 5.95 for capabilities-related issues.

At the end of the survey, we asked the respondents to indicate their interest in participating in a follow-up study on the topics covered. A total of 30 survey respondents who had expressed their interest were therefore approached for this purpose, with 21 agreeing to participate in an in-depth interview (Appendix 1). Each interview lasted from 30 to 60 minutes and was audio-recorded and transcribed by the researchers. Two researchers manually analysed the transcripts using a template analysis technique. A third researcher compared the codes and helped reach agreements on the coding. The interview insights are reported in the Discussion section to supplement the quantitative results.

3.1 Samples

Table 2 provides the demographic information of survey respondents and their firms. A comparison between early and late responders with *t*-test analyses suggests no significant difference in their key features (i.e. age and years of working experience), their firms' key characteristics (i.e. firm size and firm age) and their responses to the focal variables of interest, indicating no serious concerns for non-response bias (Armstrong and Overton, 1977). Due to variation in their professional titles, we also conducted several ANOVA analyses to check whether respondents with different positions may have different perceptions of the key concepts of interest. The ANOVA results show no significant difference, suggesting that respondents' titles do not influence how they perceive their MPM- and capabilities- related issues.

Levels	Variables	Categories	*N* (sample)	Valid %
Respondent characteristics	*Job title*	CEO	42	20.69
		CMO	40	19.70
		Marketing manager	75	36.95
		Other*	46	22.66
		Valid total	203	100.00
Firm characteristics	*Trade status*	Private	157	74.76
		Public	53	25.24
		Total	210	100.00
	Business focus	B2B	141	67.14
		B2C	69	32.86
		Total	210	100.00
	Business strategy	Cost leadership	19	9.06
		Differentiation	175	83.33
		Other	16	7.62
		Total	210	100.00
	Industry	Manufacturing	38	18.10
		Service/trade	119	56.67
		Other	53	25.24
		Total	210	100.00

Table 2.
Descriptive statistics on respondents and their firms

Notes: * The "Other" category incorporates experienced professionals who indicated sufficient knowledge on strategic marketing-related issues, titles including business development director, senior commercial director and director of sales and operations
Source: Authors own work

3.2 Measurement

This study used items borrowed from the extant literature to measure the key concepts of interest (Appendix 2). The uses of marketing metrics scales included ten items consistent with prior research (Henri, 2006). We used four items to measure firms' *diagnostic use of marketing metrics* and six items to measure their *interactive use* on a seven-point Likert scale (1 = "not at all" and 7 = "to a great extent"). To ensure that respondents used a similar set of marketing metrics as the baseline while responding to the questions in relation to the uses of marketing metrics, we first asked the respondents to select all marketing metrics their top management utilized from a list of 45 marketing metrics (Table 4). These marketing metrics were classified into seven categories of metrics: customer attitude, customer behaviour, trade customer, competition, innovation, financial and digital metrics. The first six categories of marketing metrics were adopted from a widely used list of common marketing metrics (Ambler *et al.*, 2004; Frösén *et al.*, 2013), whereas those in the digital metrics category were generated by a pilot test with over 50 MBA students specialized in digital marketing. This additional category was created to reflect the most recent developments in MPM.

This study operationalized *market-sensing capability* as a dynamic capability related to a firm's ability to identify market trends, anticipate competitors' strategies and sense market changes and assessed the concept with five-item measures on a seven-point Likert scale (1 = much worse, 7 = much better) (Fang *et al.*, 2014; Vorhies and Morgan, 2005). Sample questions include "learning about the macro-market environment" and "identifying and understanding market trends". Following Homburg *et al.* (2012), this study used four items to measure *competitive intensity*. *The extent of a firm's focus on market-related metrics* was operationalized using two items adopted from O'Sullivan (2007). The respondents were asked to rate how frequently their firms tracked market-related metrics (e.g. relative price, relative quality and market share) on a five-point Likert scale (1 = never, 5 = monthly or more) and to what extent these market-related metrics were important to their senior management team (1 = not at all, 5 = very important). We also included firm size, firm age, industry, business focus, type of ownership and business strategy as control variables.

3.3 Measurement model validation

We performed confirmatory factor analysis (CFA) to test the reliability and validity of the measurement model. A five-factor CFA results in good model fit: $\chi^2(107) = 194.77$; Chi-square value/degree of freedom (CMIN/df) = 1.82; comparative fit index (CFI) = 0.97; standardized root mean squared residual (SRMR) = 0.05; and root mean square error of approximation (RMSEA) = 0.06. The composite reliability (CR) scores range from 0.77 to 0.97, demonstrating a good internal reliability (Fornell and Larcker, 1981). The face validity was verified by conducting pilot studies with eight academic experts and eleven practitioners. To assess convergent validity, we evaluated the average variance extracted (AVE) scores and factor loadings. All items load onto their expected constructs with factor loadings larger than 0.70 (except for one item of market-sensing capability), supporting convergent validity. The AVE scores vary between 0.60 and 0.92, greater than the threshold of 0.50, further supporting convergent validity. Table 3 reports the correlation matrix with the mean, standard deviation (SD) and variance inflation factors. Despite the somewhat high correlations between some individual constructs, the square root of the AVEs is larger than the respective correlation among the variables, suggesting that items are more highly correlated to their own variable than to other variables (Fornell and Larcker, 1981). These results confirm discriminant validity. Moreover, the heterotrait–monotrait (HTMT) ratios for all the focal concepts (ranging between 0.21 to 0.83) are all below the lower threshold of

Table 3.
Correlation matrix

Variables	Mean	SD	VIF	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Diagnostic use	4.32	1.73	2.99	*0.96*												
2. Interactive use	3.78	1.52	2.92	0.79	*0.90*											
3. Focus on market-related metrics	3.20	1.34	1.59	0.53	0.52	*0.79*										
4. Competitive intensity	5.14	1.22	1.30	0.18	0.22	0.33	*0.78*									
5. Market-sensing capability	4.88	1.04		0.29	0.38	0.25	0.10	*0.77*								
6. Firm age[1]	3.13	1.08	1.72	0.07	0.14	0.13	0.24	0.15	–							
7. Firm size[1]	4.49	2.42	1.79	0.15	0.19	0.23	0.29	−0.01	0.58	–						
8. Manufacturing			1.48	−0.02	0.03	0.06	0.01	0.03	0.11	0.15	–					
9. Service			1.48	−0.04	−0.10	−0.13	0.05	−0.10	−0.11	−0.11	−0.54	–				
10. Business focus			1.13	−0.20	−0.12	−0.12	−0.12	0.10	−0.20	−0.10	0.04	−0.08	–			
11. Differentiation			2.06	0.10	0.11	0.02	−0.02	−0.03	−0.14	−0.02	−0.02	−0.06	0.01	–		
12. Cost leadership			2.07	−0.03	−0.01	0.05	0.16	0.08	0.03	−0.03	0.08	0.03	0.07	−0.68	–	
13. Ownership			1.19	−0.04	−0.06	0.05	0.12	−0.14	0.02	0.27	0.21	−0.13	−0.04	0.02	−0.02	–

Note: Square root of average variance extracted on the diagonal in italic; correlation off-diagonal; "-" represents control variables that are measured by a single item 1. Numbers log-transformed for the final data analysis
Source: Authors own work

0.85 and the 95% confidence intervals (CIs) do not include 1, further confirming discriminant validity (Hair *et al.*, 2018).

The high correlation (0.79, Table 3) between the diagnostic and interactive uses of marketing metrics attracts our attention. This correlation is likely to stem from the natural evolution of MPM within a firm: starting from the use of a handful of financial metrics only (for diagnostic use), expanding to cover metrics related to intangible outcomes (mostly for interactive use), and finally developing into a comprehensive system allowing for the tracing of interrelationships between the diverse types of metrics and uses (Clark, 1999). Thus, even though these two are distinguishable constructs (as suggested by HTMTs and discriminant validity results), in practice their development in firms is likely to follow a parallel pattern in which development efforts alternate between the two uses. Moreover, our qualitative data also suggested that these two concepts were distinct. Several instances emerged where firms used marketing metrics for frequent diagnostic purposes, but not for interactive purposes. One common instance was, if the marketing department realized that its marketing performance was below expectations, the department may have decided not to communicate such information to other stakeholders, especially external parties. The reason was that they wanted stakeholders to "have faith in [the department]." In other instances, firms lacking a strong data analytical capability, especially for small firms, were less likely to use marketing metrics to generate and communicate insights within the firm, though they may have used marketing metrics for assessment to a greater extent.

Additionally, we also examined the adoption of individual metrics by firms with high and low levels of diagnostic and interactive use of marketing metrics. We first divided the responses into four groups based on their levels of diagnostic (interactive) use of marketing metrics, respectively. We then conducted two sets of chi-square analyses to see if the choice of individual metrics was different for firms with high and low levels of diagnostic (or interactive) use. The chi-square analysis (Table 4) shows that there is a strong association between firms' uses of marketing metrics and the individual metrics they choose. Both uses are associated with the majority of consumer attitude metrics (e.g. brand awareness, commitment and brand knowledge), behaviour metrics (e.g. purchase on promotion, conversions and number of products per consumer), competition metrics (e.g. market share), innovation metrics (e.g. revenue of new products), financial metrics (e.g. ROI and marketing spend), as well as digital metrics (e.g. share of voice, cost per click and visitors). Interestingly, however, compared to firms with low interactive use, those with high interactive use tend to choose more future-looking, effectiveness- and market-related metrics, such as margin of new products, shareholder value and gross margin. This is not surprising, as interactive use offers opportunities for firms to reflect on market uncertainties and organizational goals (Simons, 1995). In contrast, diagnostic use is more often associated with retrospective, efficiency-related metrics, such as the number of new buyers, number of leads and profitability. Additionally, as the diagnostic use often promotes firms to "focus on mistakes and negative variances" (Henri, 2006, p. 533), firms with heavy diagnostic use are more likely to adopt those metrics to monitor customer satisfaction and complaints from both consumers and channel members.

Common method bias. Following Podsakoff *et al.* (2012), we used several procedural measures to mitigate the possible common method bias. For instance, we used negative-worded questions and different scales to prevent respondents from responding stylistically. Moreover, we also addressed common method bias by a number of statistical means. First, Lindell and Brandt (2000) suggest that the smallest observed correlation between variables included in a structural model can be used as a reliable proxy for common method bias. As shown in Table 3, the smallest correlation between all variables is 0.01. The finding

Categories	Interactive use	Diagnostic use
Consumer attitude metrics	**Brand awareness (5.46**)** **Commitment/purchase intent (9.69***)** **Brand knowledge (11.09***)** Consumer satisfaction (2.49) Other attitudes, e.g., liking (1.46) Image/personality (0.00) Perceived quality (0.00) **Perceived differentiation (3.96**)** Salience (0.16) **Relevance (8.25***)**	**Brand awareness (10.36***)** **Commitment/purchase intent (6.24**)** **Brand knowledge (14.45***)** **Consumer satisfaction (5.21**)** **Other attitudes, e.g., liking (12.22***)** Image/personality (1.87) Perceived quality (0.85) Perceived differentiation (1.69) Salience (0.00) Relevance (0.70)
Consumer behaviour metrics	**Purchasing on promotion (7.39***)** **Conversions (4.02**)** **Price sensitivity/elasticity (12.38***)** **No. of products per consumer (11.32***)** **Loyalty/retention (4.15**)** No. of leads (0.03) No. of consumer complaints (2.97) **Total no. of buyers (5.21**)** No. of new buyers (2.13)	**Purchasing on promotion (12.07***)** **Conversions (15.74***)** **Price sensitivity/elasticity (8.71***)** **No. of products per consumer (6.29**)** **Loyalty/retention (5.08**)** **No. of leads (4.89**)** **No. of consumer complaints (9.54*8*)** Total no. of buyers (3.15) **No. of new buyers (5.81**)**
Trade customer metrics	**Distribution/availability (5.83**)** No. of client complaints (1.67) **Client satisfaction (7.00***)**	**Distribution/availability (4.21**)** **No. of client complaints (4.89**)** Client satisfaction (0.39)
Competition metrics	**Market share (12.25***)** Penetration (3.09) Relative price (3.35) Loyalty/share (3.78) Relative customer satisfaction (3.09) Relative quality (3.59)	**Market share (10.36***)** **Penetration (6.61**)** Relative price (0.73) Loyalty/share (0.34) Relative customer satisfaction (1.99) Relative quality (2.49)
Innovation metrics	**Revenue of new products (11.01***)** No. of new products in a period (3.37) **Margin of new products (4.08**)**	**Revenue of new products (10.41***)** No. of new products in a period (1.38) Margin of new products (2.45)
Financial metrics	**Marketing spend (7.10***)** Profit/profitability (0.73) **ROI (5.13**)** **Economic value added (EVA, 5.74**)** **% Discounts (4.47**)** Sales generated (0.09) **Gross margins (9.73***)** **Shareholder value (3.86**)**	**Marketing spend (11.33***)** **Profit/profitability (5.37**)** **ROI (8.39**)** EVA (1.38)% Discounts (3.42) Sales generated (0.06) Gross margins (2.97) Shareholder value (0.65)

(*continued*)

Table 4.
Comparison between firms with high and low diagnostic/ interactive uses

Categories	Interactive use	Diagnostic use
Digital metrics	Impressions (3.03) **Share of voice (9.89***)** **Cost per click (16.72***)** Click through rate (3.82) **(Net) reach (7.41***)** **Visitors (10.49***)**	**Impressions (21.77***)** **Share of voice (16.66***)** **Cost per click (22.19***)** **Click through rate (8.43***)** **(Net) reach (10.46***)** **Visitors (8.00***)**

Notes: Numbers in brackets are χ^2 scores. Metrics bolded are those that are more likely to be selected by firms with a **high** level of diagnostic and interactive uses. Metrics bolded and underlined are those more likely to be selected by firms with a **high** level of either diagnostic or interactive use; ** $p < 0.05$; *** $p < 0.01$

Source: Authors own work

Table 4.

indicates that common method bias is not a concern. Second, in line with Lindell and Whitney (2001), we also included marketing complexity as a marker variable because it is not theoretically related to any of the variables of interest. Marketing complexity was not found to be significantly correlated with any of the variables of interest (correlation coefficients ranging from −0.08 to 0.08), indicating no major concern with common method bias. Moreover, we also included this marker variable and re-estimated the structural model. The results showed that the inclusion of the marker variable did not influence the path estimation results, further indicating that common method bias was not a concern in this study.

4. Data analysis and results

4.1 Hypothesis testing results

We tested our hypotheses using regression analysis in Stata 17. Table 5 reports the standardized path analysis results. Model 1 analyses the direct effect of the uses of marketing metrics on market-sensing capability. The standardized score of diagnostic use was used to create the quadratic term. The results show that the interactive use of marketing metrics ($\beta = 0.50$, $p < 0.01$) positively influences market-sensing capability, but not the diagnostic use ($\beta = -0.02$, $p > 0.10$). However, the squared term of diagnostic use exerts a significant impact on market-sensing capability ($\beta = 0.16$, $p < 0.05$), suggesting a U-shaped relationship.

Following Haans *et al.* (2016), we performed a uTest (Lind and Mehlum, 2010) to test the significance of the U-shaped relationship. Our results suggest that the diagnostic use initially negatively influences market-sensing capability at lower levels ($\beta = -0.19$, $p < 0.05$), but positively influences market-sensing capability at higher levels ($\beta = 0.14$, $p < 0.05$). We then estimated the extreme point of the effect of diagnostic use and calculated CIs based on Fieller's standard error (Lind and Mehlum, 2010). The results show that the extreme point is 4.57 (95% Fieller CIs: [1.31; 11.34]), confirming the presence of a U-shaped effect ($p < 0.05$). To summarize, both *H1* and *H2* are supported[3].

Model 2 tests the moderating effects of competitive intensity on the effect of uses on market-sensing capability. The moderators were entered into Model 2 by creating interaction terms between the standardized scores of the independent and moderating variables. The results show that the interactive use positively influences market-sensing capability ($\beta = 0.49$, $p < 0.01$), whereas the diagnostic use poses a U-shaped impact on market-sensing capability ($\beta = -0.04$, $p > 0.10$; $\beta_{\text{square-term}} = 0.16$, $p < 0.05$). Competitive

Paths	Model 1	Model 2	Model 3
Controls			
Firm age[a] → Market-sensing capability	0.22***	0.23**	0.23**
Firm size[a] → Market-sensing capability	−0.19**	−0.20***	−0.18***
Manufacturing[b] → Market-sensing capability	−0.02	−0.05	−0.03
Service[b] → Market-sensing capability	−0.06	−0.08	−0.08
Business focus[c] → Market-sensing capability	0.17***	0.19***	0.20***
Differentiation[d] → Market-sensing capability	−0.01	−0.01	−0.01
Cost leadership[d] → Market-sensing capability	0.04	0.02	0.02
Ownership[e] → Market-sensing capability	−0.06	−0.06	−0.07
Independent variables			
Interactive → Market-sensing capability	0.50***	0.49***	0.46***
Diagnostic → Market-sensing capability	−0.02	−0.04	−0.03
Diagnostic ^{2} → Market-sensing capability	0.16**	0.16**	0.02
Moderators			
Competitive intensity → Market-sensing capability		−0.01	−0.06
Competitive intensity × Interactive → Market-sensing capability		0.23*	0.25*
Competitive intensity × Diagnostic → Market-sensing capability		−0.19*	−0.25**
Competitive intensity × Diagnostic^2 → Market-sensing capability		0.10	0.15
Market metrics focus → Market-sensing capability			0.14
Market metrics focus × Interactive → Market-sensing capability			−0.25*
Market metrics focus × Diagnostic → Market-sensing capability			0.41***
Market metrics focus × Diagnostic^2 → Market-sensing capability			−0.13
Model fit indices	Adjusted R^2 = 20.54%	Adjusted R^2 = 20.32%	Adjusted R^2 = 22.92%

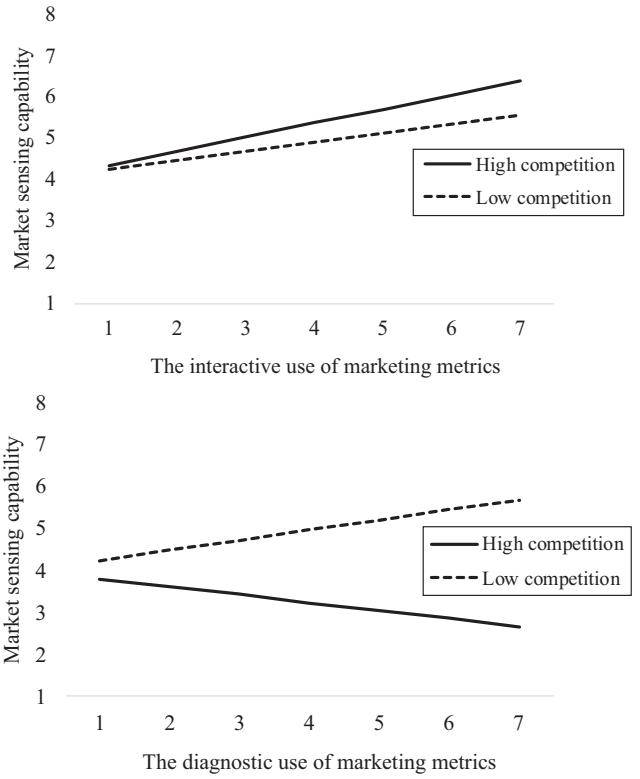
Notes: [a]numbers log-transformed; [b]the other industry as the baseline; [c]0 = B2B, 1 = B2C; [d]dual strategy as the baseline; [e]0 = private, 1 = public. Standardized coefficients (two-tailed) are reported; *$p < 0.10$; **$p < 0.05$, ***$p < 0.01$

Source: Authors own work

Table 5.
Path analysis results

intensity is found to positively moderate the impact of interactive use on market-sensing capability ($\beta = 0.23$, $p < 0.10$), but negatively interact with diagnostic use to influence market-sensing capability ($\beta = -0.19$, $p < 0.10$), supporting both *H3a* and *H3b*. However, there is no significant interaction effect between squared diagnostic use and competitive intensity on market-sensing capability ($\beta = 0.10$, $p > 0.10$). Figure 2 further depicts the moderating effects. The positive impact of the interactive use of marketing metrics on market-sensing capability becomes stronger as competition intensifies, whereas the positive impact of the diagnostic use on market-sensing capability diminishes as competition intensifies.

Model 3 adds the moderating effects of focus on market-related metrics on the relationship between uses and market-sensing capability. We find that a firm's focus on market-related metrics can mitigate the positive impact of interactive use of marketing metrics on market-sensing capability ($\beta = -0.25$, $p < 0.10$) but enhance the impact of their diagnostic use ($\beta = 0.41$, $p < 0.01$), supporting *H4b* but not *H4a*. As Figure 3 illustrates, when firms place less focus on their market-related metrics, the interactive (diagnostic) use of marketing metrics leads to increased (decreased) market-sensing capability. The results suggest that increasing the focus on market-related metrics is particularly important for the development of market-sensing capability in firms heavily relying on the diagnostic use of marketing metrics. Furthermore, the inclusion of focus on market-related metrics mitigates



Source: Author's own work

Figure 2.
The moderation effect of competitive intensity on the impact of uses of marketing metrics

the U-shaped relationship between diagnostic use of marketing metrics and market-sensing capability ($\beta = -0.03$, $p > 0.10$; $\beta_{\text{square-term}} = 0.02$, $p > 0.10$). This is likely explained by the natural evolution in the use of metrics – with more extensive use, firms will naturally shift the focus of their measurement more towards market-related metrics. Hence, adding the focus on market-related metrics as a moderator to the model is likely to exceed the quadratic effect (which, implicitly, is at least partially caused by the same development).

4.2 Integrating quantitative results with insights from interviews with industry representatives

This study illustrates that depending on the external environment and the focus of measurement, the diagnostic and interactive uses of marketing metrics pose differing effects on a firm's market-sensing capability. First, our study finds that the interactive use of marketing metrics positively influences market-sensing capability, especially in competitive markets. This finding complements and extends prior studies suggesting positive effects of MPM practices on the antecedents (i.e. market orientation and knowledge creation) of market-sensing capability (Homburg *et al.*, 2012). Our interviews with business managers echoed this finding, highlighting that the interactive use of marketing metrics prompted firms to conduct frequent marketing analyses, leading to a good understanding of the

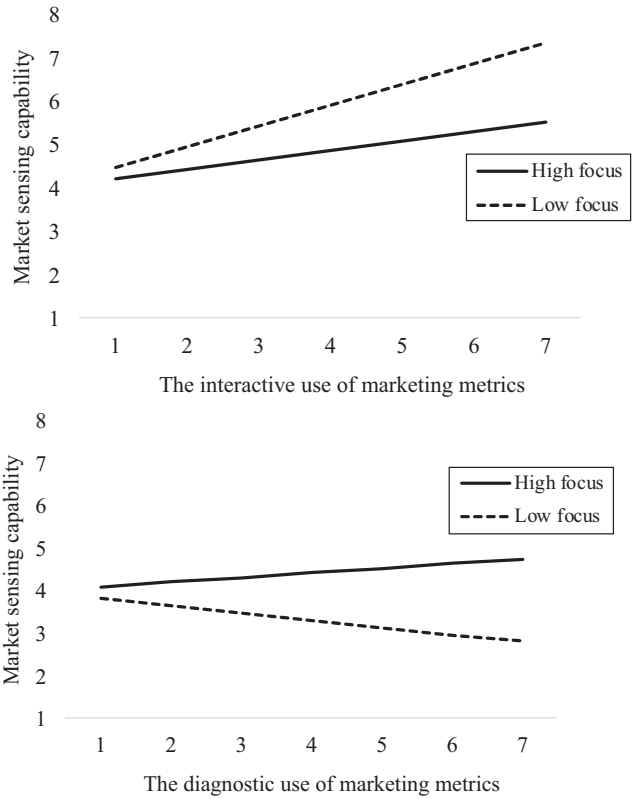


Figure 3.
The moderation effect of focus on market-related metrics on the impact of uses of marketing metrics

Source: Author's own work

market and competition, thereby improving their market-sensing capability. For instance, a marketing manager at a retailing firm stated that "[the marketing department is] actually the eyes and ears for the organization in terms of trend analysis, need analysis, and understanding where the category or categories are going to evolve in the future, which all then feed into the strategic planning for the business". This is especially pivotal when firms operate in a turbulent external environment. Interviewees stressed that because their firm operated in a competitive market, being able to sense market changes was requisite for them to succeed. The use of marketing metrics offered opportunities for their firms to address environmental changes in a timely manner.

Second, in line with previous suggestions that diagnostic use of metrics may, in fact, sometimes yield unfavourable performance outcomes (Henri, 2006), and the call for avoiding "learning traps" resulting from using marketing metric data primarily for benchmarking and control (Morgan *et al.*, 2005), our study finds that the diagnostic use of marketing metrics has a U-shaped impact on market-sensing capability. While lower levels of diagnostic use are associated with decreasing market-sensing capability, higher levels yield gains in market-sensing capability. This may be because higher levels of diagnostic use are, in practice, often paired with broader usage of metrics overall (also incorporating interactive use, see also Clark, 1999). Thus, a more comprehensive use of marketing metrics, in general,

is positively related to market-sensing capability. Its impact is further moderated by competitive intensity and focus on market-related metrics, with less competitive environments and higher focus on market-related metrics improving the effect.

Echoing these results, some interviewees highlighted that the diagnostic use of marketing metrics could offer benefits, whereas others expressed concerns about such use, especially in the context of turbulent external environments. On the one hand, some interviewees stressed that the diagnostic use of marketing metrics could enhance the credibility of the marketing department, resulting in better interdepartmental information sharing and collaboration (see also Feng *et al.*, 2015), as well as more resources invested in marketing. There was a general consensus that marketing accountability was always key. A marketing manager at a rental services firm highlighted that his firm used marketing metrics to "justify to the board why they were making certain decisions," which in turn led to more inter-departmental collaboration. The resultant collaboration allowed firms to "meet the customer needs faster and better than competitors" (a commercial manager at an aviation firm), to "understand what the competitive landscape [was]", and to "understand what the broader trends and themes [were]" (a marketing manager at a retailing firm), resulting in superior market-sensing capability.

On the other hand, some interviewees indicated that top management teams tended to be output oriented when using marketing metrics for diagnostic purposes. They further suggested that this may lead to shared understanding within the firm that departments needed to mainly, or even exclusively, focus on accomplishing pre-set objectives, especially the financial goals. Subsequently, they may ignore other critical functionalities, such as monitoring competitors, investing in customer relationships or actively managing their brands, because they are not held accountable for these activities. One retail marketing manager emphasized that it was pivotal for firms to pay special attention to market-related metrics for benchmarking, as market-related data provided valuable market insights for decision-making: "[it] is critical that [firms] collate all that information [not only financial, but also market-related information] from internal departments and external partners and try to syphon off the big opportunity areas and big themes, and group them together in order to help future strategy." Moreover, interviewees implied that the heavy focus on performance benchmarking also gave rise to conflicts between short-term goals and long-term achievements. In this situation, firms may risk sacrificing their long-term relationships with customers to reach the short-term targets (e.g. sales and profitability). For instance, a marketing manager at a high technology firm indicated that "[e]verything was measured on short-term goals [. . .] And the most important thing was to meet your sales target for the quarter [. . .] So we had this problem between short-term strategy and long-term." This is especially catastrophic in competitive markets where maintaining good relationships with customers is necessary to succeed. Some interviewees also highlighted growing demand on firms to pay more attention to monitoring market-related performance in the context of high market dynamics.

Third, our survey results show that generally, firms with high levels of diagnostic and/or interactive use employ very similar sets of marketing metrics. However, firms with high levels of interactive use tend to use more future-looking, effectiveness- and market-related metrics, whereas those with intensive diagnostic use are more inclined to adopt retrospective, efficiency-related metrics. Similarly, interviewees highlighted that a heavy focus on market-related metrics may not always be ideal, and firms need to balance the focus of both financial and market-related metrics because "if you're looking at marketing metrics too specifically, you don't see the bigger picture" (a marketing manager at a market research firm). This interviewee further underlined that "[d]ata have to be inspiring at the

end of the day, not just marketing metrics. And when they actually produce data and get so confused with the depth of the data and the detail that they [are] drilling down into, that the metrics start to lose its meaningfulness in terms of the overall big picture of what's happening with their campaign."

5. Discussion

This study unravels the differences in the diagnostic and interactive uses of marketing metrics and their different roles in influencing market-sensing capability depending on contingent factors. Specifically, our study shows that while firms with heavy interactive use tend to use more future-looking, effectiveness- and market-related metrics, those with intensive diagnostic use are more inclined to adopt retrospective, efficiency-related metrics. Moreover, our results support a positive effect of interactive use on market-sensing capability, but a U-shaped effect of diagnostic use. Such effects are found to be moderated by competitive intensity and firm's focus on market-related metrics.

5.1 Theoretical contributions

Our study contributes to the strategic marketing and, more specifically, MPM literature in four main respects. First, given the scant attention paid to the ways in which firms use their marketing metrics, our first contribution to the MPM literature lies in the empirical exploration of the diagnostic and interactive uses of marketing metrics. While prior literature has theorized on the difference in diagnostic and interactive uses of performance measurement (Henri, 2006; Simons, 1995), our study extends this stream of the literature by empirically unravelling the practical differences between diagnostic and interactive uses of marketing metrics. Our study underlines that the two uses are associated with different sets of metrics that direct managerial focus to different strategic objectives (Herhausen *et al.*, 2018; Morgan and Rego, 2006).

Second, responding to the increasing calls for understanding how different uses of marketing metrics influence marketing capability development (Nath, 2020), our study empirically addresses the differing roles of diagnostic and interactive uses of marketing metrics in developing a firm's market-sensing capability. Our findings reveal a positive role of interactive use of marketing metrics in driving market-sensing capability but a U-shaped impact of their diagnostic use. As such, our study extends the existing MPM literature by examining the omitted intersection between the uses of marketing metrics and market-sensing capability, a key research area that needs further investigation (Liang and Gao, 2020). Moreover, it provides further empirical support for a potentially detrimental effect of diagnostic use of metrics versus a positive effect of their interactive use on performance outcomes, as theorized in the management control literature (Simons, 1995).

Third, our study contributes to the discussion of the contextuality in MPM, highlighting the importance of aligning a firm's purposes of using marketing metrics with its business environment (Frösén *et al.*, 2016). While previous literature has mainly focussed on examining how contingency factors determine the design and adoption of individual marketing metrics (Frösén *et al.*, 2013; Mintz and Currim, 2015), this study extends this view by empirically confirming that the impact of marketing metric uses on marketing sensing capability is also contingent upon both firm's internal, i.e. focus on market-related metrics, and external factors, i.e. competitive intensity. This suggests that the effectiveness of MPM practices depends on the context in which such practices are applied.

Fourth, our study highlights that firms need to focus on a carefully selected set of metrics to achieve the full potential of MPM systems. Extending previous studies that confirm a hindering role of financial metrics in market adaptation (Nath, 2020) and addressing call for

alignment between the use of marketing metrics and a firm's managerial focus (Herhausen *et al.*, 2018), our study finds that placing a heavy focus on market-related metrics with the interactive use of marketing metrics may not yield optimal results in terms of market-sensing capability. Rather, interactive uses are particularly beneficial in firms with a weaker focus on market-related metrics, whereas a heavy focus on market-related metrics benefits firms implementing them mostly for diagnostic purposes. Our findings further stress the need for a balanced selection of both financial and market-related metrics (see also Frösén *et al.*, 2016; Homburg *et al.*, 2012), as well as an alignment of the selection of metrics with their types of usage in decision-making.

5.2 Managerial implications

For managers, our study provides novel insights into the differing effects of the diagnostic and interactive uses of marketing metrics on market-sensing capability, highlighting a primary need for developing the latter and for using the former with caution. Our specific implications for marketing managers directly in charge of MPM, as well as for business executives concerned with managing the overall competitive stature of the firm, are fourfold.

First, the U-shaped relationship between diagnostic use and market-sensing capability established in our study suggests that the most traditional approach of using marketing metrics for diagnostic purposes may not always yield benefits. The setting and monitoring of marketing targets based on metric information can sometimes promote an inward, backward-looking and/or short-term focus, reinforce departmental barriers and reduce knowledge sharing. This can be particularly harmful for firms operating in highly competitive markets, because competition heightens firms' need for continuously sensing the market, which cannot be fulfilled by a retrospective, diagnostic use of marketing metrics. As such, based on our findings, we recommend complementing diagnostic use of marketing metrics with their interactive use to address the dynamism of competitive markets.

Second, and relatedly, we recommend all firms establishing their interactive use of marketing metrics that is pivotal to improving their ability to anticipate, detect and sense market changes. This includes applying marketing metrics to proactively trace changes in the marketplace, directing focus on critical emerging changes, fostering discussion within the firm and facilitating decision-making on resource (re-) allocation. The interactive use of marketing metrics is especially important for firms operating in competitive markets because collecting and generating market intelligence is vital to gain competitive advantage (Wilden and Gudergan, 2015). For instance, trend and need analyses may help to understand how the market is going to evolve in the future. Such analyses can be supported by consolidating customer and competitor data in a systematic manner, investing in advanced analytical techniques for better data-driven decision making and working closely with other departments to share insights throughout the firm. Moreover, even if firms with a high level of interactive use of metrics tend to rely heavily on market-related metrics, we recommend a balanced use of diverse metrics (addressing financial-, customer- and competitor-related outcomes), as well as paying particular attention to examining their interrelationships. This provides marketers with strategically relevant, real-time feedback on their marketing actions, simultaneously allowing them to enhance knowledge about their customers and the market and subsequently anticipate and respond to market changes.

Third, some of our interviewees stressed that, despite their top management's acknowledgement of the benefits of the interactive use of marketing metrics, they were only able to use metrics for simple assessment because of a lack of analytical or data mining capabilities that prevented them from generating valuable insights from the information. This, as related to our previous recommendations of a balanced use of a variety of measures

for both diagnostic and interactive purposes, highlights the importance of enhancing marketing employees' data analytical skills, to reap full benefits from marketing metrics. Alternatively, marketing departments should at least work closely with data analytics specialists and further encourage an interactive use of marketing metrics throughout their firm.

Fourth and finally, our study highlights the importance of selecting appropriate metrics for MPM. Though partly similar sets of marketing metrics are used to serve both diagnostic and interactive purposes, some metrics appear to be more commonly associated with diagnostic versus interactive uses. This suggests that particular attention should be paid to the intended *uses* of metrics when designing a firm's metric system for MPM.

5.3 Limitations and future research

The limitations of this study point to future research opportunities. First, even though Ireland provides an appropriate context for MPM research, collecting data from a single country implies that our results should be generalized to other national settings with caution. Therefore, findings from firms characterized by less developed marketing capabilities may well differ from ours. For instance, firms operating in emerging markets or industries characterized by a less market-oriented approach, such as those operating in the early phases of the value chain, may benefit from diverse uses of metrics and/or diverse types of efforts put into developing dynamic capabilities. Cross-cultural comparison and/or industry-specific studies would help provide a more rounded view of the specific, potentially context-contingent relationships among the uses of marketing metrics, capabilities and firm performance. Moreover, future research could use a longitudinal design to provide a more robust validation of our findings.

Second, as this study is among the first attempts to investigate the differing impacts of the uses of marketing metrics on market-sensing capability, many open questions remain unanswered. For instance, our study finds that the diagnostic and interactive uses of marketing metrics have diverse impacts on the development of dynamic capabilities. Notwithstanding our initial contribution to the understanding of rationales underlying these adverse impacts, future research may extend our study by further exploring the more specific mechanisms through which the distinct uses of marketing metrics influence capability development. Moreover, our results show that the inclusion of focus on market-related metrics mitigates the curvilinear relationship between diagnostic use and market-sensing capability. In this vein, we recommend future research extending this stream of the literature by exploring the moderated curvilinear effect of diagnostic use on capability development.

Third, as performance measurement practices are considered a means of strategy formulation and implementation (Henri, 2006; Krush *et al.*, 2016), a question remains as to how firms can use diverse marketing metrics to make better strategic plans and/or enhance strategy execution. This task becomes even more challenging when firms face an increasingly complex business environment. Thus, future studies into how organizational and market contingencies affect the design and management of marketing metrics are much needed. In addition, our interview data suggest that a firm's comparison of actual marketing performance against pre-set goals may influence how it uses marketing metrics. For instance, when a firm's marketing performance fails to meet expectations, it tends to not disclose such information internally or externally. This is in congruence with management studies suggesting that a firm's benchmarking of expectations against actual performance can lead to various managerial behaviours, e.g. reduced risk-taking behaviours resultant from performance below aspirations (Audia and Greve, 2006). Thus, we recommend that

future research delve deeper into how the diagnostic use of marketing metrics may lead to different managerial behaviours under different conditions (i.e. performance below expectations vs performance above expectations).

Notes

1. We thank the Associate Editor for this analogue.
2. We thank the Associate Editor for the constructive feedback on the arguments leading to the development of *H4*.
3. As a robustness check, we also performed tests for the presence of a sigmoid function (*s*-curve) (Haans *et al.*, 2016). We generated the cubic term of the diagnostic use and included it in the estimation of market-sensing capability. The coefficient of this cubic term is not significant ($\beta = -0.09$, $p = 0.58 > 0.05$). Thus, there is no sigmoidal effect of diagnostic use on market-sensing capability, further confirming this U-shaped relationship.

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Appendix 1

No.	Pseudonym	Gender	Job Title	Industry
1	Jack	Male	Marketing manager	Retailing
2	Leo	Male	Sales and marketing manager	Construction
3	John	Male	Business development director	High tech
4	Patrick	Male	Marketing manager	Rental service
5	Sean	Male	Marketing manager	Retailing
6	Amir	Male	Marketing manager	Retailing
7	David	Male	Commercial manager	Aviation
8	Will	Male	Business director	Service
9	Brian	Male	Managing director	Digital marketing
10	Anna	Female	Marketing manager	Sports
11	Ava	Female	Marketing manager	Cloud computing
12	Sinead	Female	Marketing manager	Consultancy
13	Grace	Female	Marketing manager	Software
14	Mary	Female	Marketing manager	Consultancy
15	Linda	Female	Managing director	Consultancy
16	Sarah	Female	Marketing manager	Market research
17	Helen	Female	Product manager	Social media
18	Lucy	Female	Marketing manager	Manufacturing
19	Emma	Female	Brand manager	Telecommunication
20	Sophia	Female	Managing director	Health
21	Meghan	Female	CEO/Founder	Digital marketing

Source: Authors own work

Table A1. Basic information of interview respondents

Appendix 2

Table A2.
Measurement model

The constructs and items	*Factor loadings*	*Properties*
Diagnostic use (Henri, 2006) (1 = not at all, 7 = to a very great extent)		
Our top management team currently uses marketing metrics to	0.97	CR = 0.97
• Compare marketing outcomes and expectations	0.97	AVE = 0.92
• Monitor marketing results	0.92	
• Review key marketing performance measures	–	
• Track progress towards goals*		
Interactive use (Henri, 2006) (1 = not at all, 7 = to a very great extent)		
Our top management team currently uses marketing metrics to	0.94	CR = 0.94
• Tie the organization together	0.92	AVE = 0.81
• Enable discussion in meetings of supervisors, subordinates and peers	0.89	
	0.84	
• Enable the organization to focus on critical success factors	–	
• Enable the organization to focus on common issues	–	
• Develop a common vocabulary in the organization*		
• Enable continual challenge and debate underlying results, assumptions and action plans*		
Market-sensing capability (Fang et al., 2014; Vorhies and Morgan, 2005) (1 = much worse, 7= much better)		
Compared to our major competitors, our firm performs (better or worse) in	0.87	CR = 0.88
	0.80	AVE = 0.60
• Learning about the macro-market environment	0.78	
• Identifying and understanding market trends	0.72	
• Discovering competitors' strategies and tactics	0.67	
• Learning about customer needs and requirements		
• Gaining insights about the channel		
Competitive intensity (Homburg et al., 2012) (1 = strongly disagree, 7 = strongly agree)		
Please indicate the extent to which you agree with the following statements	0.85	CR = 0.82
	0.78	AVE = 0.61
• Intensive competitor-related activities are a hallmark of our industry	−0.71	
• There are many promotion wars in our industry		
• Competition in our industry is very intense*		
• There are many competitive rivalries in our industry		
Focus on market-related metrics (O'Sullivan, 2007) (five-point Likert)		
Please indicate the extent to which you agree with the following statements	0.85	CR = 0.77
• Importance of market-related metrics	0.72	AVE = 0.62
• Tracking frequency of market-related metrics		

Note: *Item deleted due to either high cross-loading or low factor loading
Source: Authors own work

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