Marketing resource-capability complementarity and firm performance in B2B firms

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Abstract

Purpose – This study aims to examine how market orientation (MO), marketing resources and marketing resource deployment are related and impact business-to-business (B2B) firm- and customer-level performance.

Design/methodology/approach – A self-administrated questionnaire was used to collect data from 251 firms out of a sample of 1000 B2B firms selected from a database of businesses.

Findings – Marketing resources and marketing capability are complementary in contributing to both firm and customer performance. In addition, they are partial mediators of the relationship between MO and firm- and customer-level performance. Only marketing resources fully mediate the relationship between MO and firm-level performance.

Research limitations/implications – This study relied on self-reporting by marketing executives, thus inferences about causality should be made with caution. Specifically, the time sequence of the relationships among resource possession and resource deployment and marketing results is not easily discernible with cross-sectional data.

Originality/value – This study sought to address research gaps in the two research streams; MO-firm performance via the mediating role of marketing resources and deployment, and the resource based view (RBV) resource–deployment interaction. Our contribution to the literature is threefold. First, MO indirectly enhances performance at both firm and customer level via marketing resources and marketing resource deployment. Second, while possessing marketing resources does explain some of the economic rent differentials, the effect depends fundamentally on how firms deploy their marketing resources. Third, our findings suggest research on resources, resource deployment and cross-level firm performance should be conducted at the business process level within firms.

Keywords Mediation, Organizational performance, Market orientation, Marketing capability, Strategic marketing, Moderation, Resources

Paper type Research paper

1. Introduction

A firm's ability to maximize its resources through specific operational capabilities is critical to its market success. It is now recognized that capabilities are more important than the possession of resources (O'Cass and Sok, 2012), at least in the sense that simply possessing resources does not lead to achieving specific marketplace objectives in competitive markets without aligned capabilities. The resourcecapability intersection may explain how some business-to-business (B2B) firms overcome resource deficiencies by deploying such resources through high-level capabilities. The simultaneous roles of marketing resources (e.g. marketing knowledge and

skills related to the marketing mix[1]) and marketing resource deployment has received significantly less attention than factors such as market orientation (MO) in the context of firm performance. This point is important because despite the prominence of MO, its link with firm performance (direct versus indirect; strong versus weak impact) is still the subject of continuing attention and debate among scholars (Connor, 2007; Ketchen *et al.*, 2007; Green *et al.*, 2005; Kumar *et al.*, 2011a, 2011b; Bicen and Hunt, 2012; Heirati *et al.*, 2013). The key contention raised here is that it is the marketing function as seen in the accumulation and deployment of marketing resources and capabilities that facilitates the link between the firm and its customers, and thus the benefits deriving from the precise connections between MO, marketing resources and capabilities become vital in achieving marketplace success.

We contend that a firm may possess a high level of valuable, rare, inimitable and non-substitutable (VRIN) marketing resources, but will only fully realize this potential through superiority in its marketing resource deployment capabilities. This point raises questions regarding the specific relationship between MO, marketing resources, their deployment and how such relationships influence various types of performance beyond overall firm performance. Many proponents of MO endorse it as capability, which enables firms to stay close to customers (Zhou *et al.*, 2005; Ngo and O'Cass, 2012). Marketing capabilities enable firms to manage their connection to the customer, which contribute to both customer - and firm-level performance (Moorman and Rust, 1999; Morgan *et al.*, 2009; Vorhies *et al.*, 2011; Murray *et al.*, 2011; O'Cass and Sok, 2012). Surprisingly, the intervening role of marketing resources and the firms' capability to deploy them has received only modest attention and even less in the context of the MO-firm performance link in B2B contexts.

Further, little attention has been directed to marketing resource possession, marketing resource deployment and their interaction in contributing to performance at different levels (e.g. firm and customer levels), especially in B2B market contexts. Rather, researchers have argued that superior performance and profit can be generated through resource-picking, which enables firms to not only acquire good resources, but also avoid acquiring bad resources (Makadok, 2001; Makadok and Barney, 2001; Barney, 1986; Ambrosini *et al.*, 2009; Barney *et al.*, 2011). On the other hand, capability-building is argued by some to enable firms to outperform competitors in deploying resources toward rent-creation (Makadok, 2001; Amit and Schoemaker, 1993; Ethiraj *et al.*, 2005). Indeed, according to Makadok (2001), capabilities affect firm performance only after the possession of resources. As such, resource possession and resource deployment cannot be isolated (i.e. dealt with independently) in rent-creation processes. While resource picking and deployment are seen as being substitutable in most cases (Makadok, 2001; Hitt *et al.*, 1991, 1990), we argue marketing resource possession and the capability to deploy marketing resources complement each other in creating superior performance outcomes.

Our study addresses the above research gaps in the MO-firm performance literature by examining the intervening role of marketing resources and deployment of them, as well as resource possession–deployment interaction in B2B firms. Specifically, we pursue the argument that marketing resources and marketing resource deployment mediate the MO-performance link; and that marketing resources and marketing resource deployment are complementary in their contribution to both customer-level and firm-level performance in B2B markets.

The remainder of the paper is structured as follows. First, we outline the theoretical underpinnings of our framework and develop the hypotheses. Subsequently, we discuss the research method and data collection procedures developed to test the model. Next, we present the results. The final section discusses the findings, contributions and implications of the study and outlines future research on marketing resources, capabilities and performance of firms.

2. Theory and hypotheses

Wernerfelt (1984) makes an important contribution to what could be considered a formal precursor to the conceptualization of the Resource Based View (RBV), arguing that for the firm, resources and products are two sides of the same coin. This proposition articulates the view that while performance is driven directly through the firms' product(s), it is indirectly driven by the resources possessed (and how they are used) in the production of the products it puts in the marketplace.

In picking up on this point, we draw from Barney (1991), Wernerfelt (1984) and Barney *et al.* (2011) and argue that firms achieve above normal performance outcomes by identifying and acquiring resources that are critical to the development of superior products and using such products to capture and keep customers. Therefore, while resources are unquestionably important to a firm's competitive advantage, they are by themselves insufficient (Murray *et al.*, 2011). To achieve superiority in target markets, firms needs to also possess and be able to replicate routines or integrate processes through which resources can be coordinated and deployed. In effect, resources are latent and provide no benefit until deployed and they cannot be deployed without the aligned capability. This view implies that while a firm may possess marketing resources, their ability to create positive impacts on performance only manifests with the application of superior marketing capabilities. Therefore, customer-level performance outcomes and firm performance differentials come from the creation of synergistic configurations of the marketing resources and their deployment.

In addition, market-oriented firms, because of their greater market sensing capability, are better placed to understand what resources they need and how best to use them to achieve specific outcomes (O'Cass and Sok, 2012). MO emphasizes understanding target customers and taking into account competitor's moves on the basis of the organization-wide generation of market intelligence pertaining to current and future customer needs, dissemination of the intelligence across departments, and organization-wide responsiveness to it (Kohli and Jaworski, 1990, p. 6).

However, even if firms recognize and promote the importance of MO, many make little discernable progress toward creating a market-oriented organization because they lack the means to implement it (Gebhardt *et al.*, 2006).

In this sense, MO may indirectly contribute to firm performance via specific business processes, especially marketing (Zhou *et al.*, 2005; Moorman and Rust, 1999; Ngo and O'Cass, 2012). Acting on market knowledge about customers to serve them is a critical task for marketers, and in this setting, marketing capabilities help transform the firms' market knowledge resources (generated via the MO capability) into market success and financial performance (Heirati *et al.*, 2013). Figure 1 depicts proposed research model and illustrates the relationship between marketing resources, the capability to deploy marketing resources and the consequent outcomes. Our conceptual framework picks up on the organization response element of MO. We advance that MO through this responsiveness element promotes the resource accumulation and deployment aspects in the firms' efforts to implement its MO.

The resource possession–resource deployment logic is context specific, and as such, it should be modeled and tested at the

Figure 1 Theoretical model of the complementarity between marketing resources and deployment and their mediation effects on the linkages between MO and cross-level performance
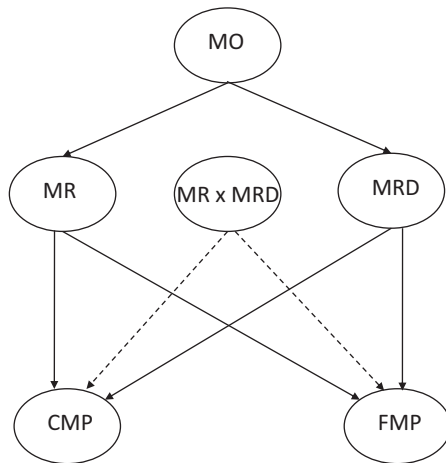
Note: MO – market orientation; MR – marketing resources; MC – marketing capabilities; CMP – customer-level marketplace performance; FMP – firm-level marketplace performance

Mediational effects
interaction effects

micro-level within firms. Further, the disaggregation view of measuring capabilities and firm performance indicates that as capabilities reside at the operational level and is at this level they have the greatest impact on outcomes related to marketplace actions, aggregate firm-level measures are likely to mask much of the variance within firms (Ethiraj *et al.*, 2005; Ray *et al.*, 2004). Taking account of this issue, we focus on marketing resource possession–resource deployment capability at the business process level in the context of MO, marketing resources, marketing resource deployment and marketplace performance (both customer- and firm-level).

Our cross-level approach to performance focuses on how resources and their deployment influence the firms' customer-level performance related to customer satisfaction, relationship building, customer attraction and retention. This customer-level focus is important because "marketing managers are being required to demonstrate the profitability of their marketing actions down to the level of their individual customers and on an ongoing basis" (Ramani and Kumar, 2008, p. 27). The second type of performance we focus on relates to marketplace performance related to sales, profit, market share and overall financial performance for the firms products. These are typical performance indicators, which are widely used in MO-firm performance research (Green *et al.*, 2005; Matsuno and Mentzer, 2000; Murray *et al.*, 2011; Heirati *et al.*, 2013).

We adopt the view here that MO provides the context for firms to define the resources they need, and how best to use them and that it unifies resources and capabilities into a cohesive whole (Zhou *et al.*, 2005; Morgan *et al.*, 2009; Day, 1994). MO is valuable in that it enables firms to better serve

their target markets because of its resource–capability driving nature. With its strong focus on serving customers, MO can help direct the marketing resources necessary to fulfill customers' needs. However, the effectiveness and value of MO depends on the presence of marketing activities (Moorman and Rust, 1999; Murray *et al.*, 2011). This view fits with the contentions raised in the literature that market-oriented firms have an advantage in the speed and effectiveness of their responses to both opportunities and threats. As such, within the broader marketing strategy literature MO can be seen to provide firms with a market-sensing and linking capability that leads to greater performance outcomes (Kirca *et al.*, 2005). Considering these points, we propose that MO provides the foundation that allows B2B firms to sense and identify what resources are required, and how to maximize their responses to the market through specific capabilities to deploy requisite resources to gain advantages and achieve firm objectives in relation to customer-level marketplace, as well as financial outcomes. It is the marketing resource and its deployment that links the firm to its business market and provides superior performance across these two domains. Thus:

H1. Marketing resources mediate the relationship between MO and (a) customer-level marketplace performance, and (b) firm-level marketplace performance.

H2. Marketing resource deployment mediates the relationship between MO and (a) customer-level marketplace performance, and (b) firm-level marketplace performance.

Further, resource possession–resource deployment complementarities are a distinctive feature of the resource-based logic. In effect, complementarities help explain marketplace performance. Importantly, resources can be wide ranging, and in this study, we focus on the importance of those that seen as intangible, that is, the skills and knowledge possessed by the firm. They are characterized as static, operand (produce no effect), people dependent and transferable. On the other hand, deployment capabilities are business processes that are applied to resources to create value. They are characterized as dynamic, operant (produce effect on operand resources), embedded in business processes (process dependent) and built up on resources. Possessing a valuable resource is not sufficient, instead business processes are essential as they facilitate the manipulation of resources in the rent creation process (Ray *et al.*, 2004; Wiklund and Shepherd, 2003; Eisenhardt and Martin, 2000).

Importantly, this point raises the complementarity between resources and capabilities. We view complementarity as the degree to which the value of a resource is dependent on the capability and vice versa. In this sense, "doing more of one thing increases the returns to doing more of another" (Milgrom and Roberts, 1995, p. 181; see also Moorman and Slotegraaf, 1999; Dierickx and Cool, 1989). Therefore, marketing resource–deployment capability complementarity occurs when the returns associated with marketing resources increase in the presence of superior marketing capability. These are natural complements, and the interaction between the knowledge resources possessed by the B2B firm and their resource deployment capability is a key feature of achieving

marketplace performance objectives. This view rests on the notion that capabilities (ability to deploy resources) enable firms to perform value-creating activities. Thus, the capability to deploy marketing resources more than simple possession of marketing resource alone provides the advantage (Day, 1994) and is thus a key performance enhancing mechanism within firms. Therefore, we contend that the interaction of marketing resources and the capability to deploy them provide firms' the capacity to achieve superior marketplace performance more than the resource or deployment in isolation. Thus:

H3. Marketing resources and marketing resource deployment complementarity positively affects (a) customer-level marketplace performance, and (b) firm-level marketplace performance.

3. Method

3.1 Sampling and data collection
An empirical study was designed to collect data from senior executives of manufacturing and B2B service firms. Although the selection of the sample was based on convenience, we considered variations in firms across the manufacturing and service sector as a suitable environment to test the theory. We focused on B2B manufacturing and B2B professional service firms operating in 20 different two-digit Standard Industrial Classification code industries (20, 30, 40) to not only provide a reasonably similar context for respondents but also to be broad enough for the results to be generalizable. A sample of 1,000 firms located in three major cities in the eastern states was selected from a database of businesses.

We used a self-administrated questionnaire as the primary means for data collection, and followed the procedure adopted by Ray *et al.* (2004). Contact was made with a specifically identified senior marketing executive and their participation sought. Following this, surveys sent to marketing executives who served as the informants. Senior marketing managers were chosen as key informants because of their specific knowledge and expertise of how their marketing resources and capabilities are managed[2].

We received 251 useable surveys, producing a response rate of 25 per cent. Of the sample, 51.8 per cent operated within the services sector, followed by industrial manufacturing (25.5 per cent), foods and beverage (9.6 per cent), IT (6.4 per cent), construction (4.8 per cent) and plastic and rubber (1.6 per cent). The sample contained 42 per cent small-sized firms (the number of <20), 24 per cent medium-sized firms (the number of employees >20 and <200) and 34 per cent large-sized firms (the number of employees >200). Of the returned surveys, 69 per cent came from firms operating solely within the domestic market and the remainder operated in both domestic and export markets. Approximately 38 per cent of firms had total sales volumes of less than $1 million and the remainder were over $1 million (of these, 48 per cent had volumes over $9 million).

3.2 Survey development
3.2.1 Market orientation
We measured MO using nine items adapted from Jaworski and Kohli (1993) and Matsuno and Mentzer (2000). The respondents indicated the extent to which they agreed or disagreed with the nine statements on a scale with 1 indicating *strongly disagree* and 7 *strongly agree*.

3.2.2 Marketing resources[3]
We measured marketing resources by developing four items which were based on the work of Slotegraaf *et al.* (2003). The respondents indicated the extent to which they agreed or disagreed with the four statements about their firm's possession of knowledge and skills related to specific marketing mix elements, with 1 indicating *strongly disagree* and 7 *strongly agree*. The instructions and items asked the respondent to think in terms of the possession of the resources relative to their major competitors.

3.2.3 Marketing resource deployment[4]
We measured marketing resource deployment capability by developing four items based on the work of Slotegraaf *et al.* (2003). The respondents indicated the extent to which their firm effectively deployed possessed knowledge and skill resources to implement marketing mix activities. The instructions and items asked the respondent to think in terms of deployment of the resources relative to their major competitors. We used a 7-point scale ranging from 1, *not at all*, to 7, *extensively*.

3.2.4 Customer-level marketplace performance
We measured customer-level marketplace performance using four items adapted from Jayachandran *et al.* (2005) and Ramani and Kumar (2008). The respondents rated the customer-level effectiveness of marketing mix activities (e.g. customer satisfaction, relationship building, attraction and retention) relative to their major competitors. The response set for these items was a 7-point scale ranging from 1, *very low*, to 7, *very high*.

3.2.5 Firm-level marketplace performance
We measured firm-level marketplace performance using four items adapted from Jaworski and Kohli (1993), Matsuno and Mentzer (2000) and Moorman and Rust (1999). The respondents rated the firm-level effectiveness of marketing mix activities in terms of sales, market share, profitability and overall performance, relative to their major competitors. The response set for these items was a 7-point scale ranging from 1, *very poor*, to 7, *very good*.

3.3 Initial survey assessment
To examine the measures prior to administering the surveys we followed a similar procedure to Desarbo *et al.* (2001) and Menguc and Auh (2006). We provided six senior academic scholars in the area of the RBV and strategic marketing with the conceptual definitions of the constructs, corresponding items and a set of instructions for judging. We then tested the draft survey using five senior marketing executives. The executives were required to complete the draft survey and discuss the items of the survey for comprehension, logic and relevance (c.f. Menguc and Auh, 2006; Desarbo *et al.*, 2001). Specifically, we requested them to think if it was possible to interpret what each item was asking in more than one way and to report these interpretations. They were also asked to provide explanation on why they responded the way they did on each item. The feedback received indicated that the survey was adequate and there was no need to modify any questions and/or scales.

3.4 Analytic technique

We estimated our model using partial least squares (PLS). PLS focuses on maximizing variance explained in exogenous and endogenous variables (Fornell and Bookstein, 1982). Specifically, we followed the procedures outlined by Chin *et al.* (2003) and adopted by Slotegraaf and Dickson (2004) to test the hypotheses, specifically in relation to test the linkages in the interaction model. First, indicators reflecting the constructs that form the complementary construct (i.e. interaction effect) were standardized to reduce the risk of multicollinearity and aid interpretation (Aiken and West, 1991). Second, the product indicator reflecting the latent interaction construct was computed by multiplying the two sets of indicators. Finally, the PLS procedure was then used to estimate both outer measurement models and the inner structural model. To test mediation effects, we followed the procedure suggested by Baron and Kenny (1986).

3.5 Common method bias considerations

Common method variance arising from collecting data via single source methods may bias relationships among constructs. As such, we conducted two tests to assess the potential for common method bias. First, we conducted a Harmon's one-factor test (Podsakoff and Organ, 1986), which resulted in six factors with eigenvalues greater than 1 and the variance explained was 75.47 per cent. As one factor was not present, and the majority of variance was not accounted for by one general factor, and common method variance was not evident. Second, we conducted a marker variable test followed a procedure suggested by Lindell and Whitney (2001). We used market type (export versus domestic), which is a theoretically unrelated marker variable ($r_M = 0.07$, $p = 0.46$) to adjust the correlations among constructs. The average variance of the unadjusted and adjusted correlations between the constructs was minor ($r_U - r_A = 0.04$), providing no evidence of common methods bias.

We used PLS Graph 3.0 for the estimation of outer measurement models, specifically assessing the adequacy of outer measurement models through an examination of component loadings, item (and construct) reliabilities, convergent validity and discriminant validity (see Hulland, 1999; O'Cass and Ngo, 2011).

3.5.1 Measurement item and construct reliabilities

As shown in Table I, all the indicators in the outer measurement models had acceptable bootstrap critical ratios (>1.96) with loadings (0.67 to 0.96) greater than the recommended 0.5 (Hulland, 1999), thus demonstrating adequate individual item reliabilities. Average variance extracted (AVEs) values for all constructs were uniformly acceptable ranging from 0.50 to 0.91.

3.5.2 Convergent validity

We examined convergent validity using the internal consistency measure (composite reliability) developed by Fornell and Larcker (1981), which is considered a better choice than coefficient alpha (Shook *et al.*, 2004). Table II reports the internal consistency values for all constructs in the second column of Table II. These values (ranging from 0.80 to 0.98) were above the threshold of 0.70, indicating convergent validity (c.f Nunnally, 1978).

3.5.3 Discriminant validity

We assessed the discriminant validity of the four constructs in two ways. First, Fornell and Larcker (1981) suggest the use of AVE, which indicates discriminant validity is evident if the square root of the AVE is greater than all corresponding correlations. As shown in Table II, the square roots of the AVE values are consistently greater than the off-diagonal correlations. Second, O'Cass and Ngo (2007) suggest that satisfactory discriminant validity among constructs is obtained when the correlation between two composite constructs (the off-diagonal entries) are not higher than their respective reliability estimates. An examination of Table II demonstrates that no individual correlations (0.29 to 0.75) were higher than their respective reliabilities (0.80 to 0.98), thus indicating satisfactory discriminant validity of all constructs in both approaches.

3.6 Test of mediation: *H1* and *H2*

Having established the psychometric properties of the measurement models, we test *H1* and *H2* following a three-step procedure adopted by Cording *et al.* (2008) and Zhou *et al.* (2008). First, we followed Baron and Kenny's (1986) procedure and estimated six models. To establish mediation, four conditions must hold:

1 the independent variable must affect the dependent variable;
2 the independent variable must affect the mediators;
3 the mediators must affect the dependent variable; and
4 when mediators enter the model, the contribution of a previously significant independent variable must drop substantially for partial mediation and become insignificant for full mediation.

Model 1 contained customer-level marketplace performance as the only endogenous variable, and Model 2 added marketing resources to Model 1 (testing *H1a*). In Model 3, we added marketing resource deployment to Model 1 (testing *H2a*), and in Model 4, with firm-level marketplace performance as the only endogenous variable. In Model 5, we added marketing resources to Model 4 (testing *H1b*), and in Model 6, added marketing resource deployment to Model 4 (testing *H2b*).

In *H1*, we predict marketing resources mediates the effect of MO on (a) customer-level marketplace performance and (b) firm-level marketplace performance. As shown in Table III, MO positively influences customer-level marketplace performance (Model 1, $\beta = 0.35$, *t*-value = 6.71), and firm-level marketplace performance (Model 4, $\beta = 0.29$, *t*-value = 4.93), thus satisfying the first condition. Furthermore, MO positively influences marketing resources (Model 2, $\beta = 0.44$, *t*-value = 6.79; Model 5, $\beta = 0.44$, *t*-value = 7.01), satisfying the second condition. Moreover, marketing resources positively influences customer-level marketplace performance (Model 2, $\beta = 0.34$, *t*-value = 4.48), and firm-level marketplace performance (Model 5, $\beta = 0.39$, *t*-value = 5.37), satisfying the third condition. When we compare Model 1 and Model 2, we find that the positive effect of MO on customer-level marketplace performance in Model 1 becomes weaker in Model 2 ($\beta = 0.35$ vs. 0.19), satisfying the fourth condition. Thus, marketing resources partially mediates the relationship between MO and

Table I Measurement model results

Constructs and manifest variables	Loadings[a]
Market Orientation Behavior (MO) AVE = 0.59 Composite Reliability = 0.93	
Market orientation refers to the organization-wide generation of market intelligence, dissemination of the intelligence across departments and organization-wide responsiveness to it	
Intelligence Generation (IG) AVE = 0.73, composite reliability = 0.89	
1 We generate information about our customers (e.g. feedback on delivered products and/or services, needs and product/ service preferences) (MO1)	0.85
2 We generate information about our competitors (e.g. competitive products and/or services, pricing, promotion campaigns and strategic moves) (MO2)	0.86
3 We generate information about our suppliers (e.g. manufacturing process, industry practices and clientele) (MO3)	0.85
Intelligence Dissemination (ID) AVE = 0.80, composite reliability = 0.92	
4 We disseminate information about customers (e.g. feedback on delivered products and/or services, needs and product/ service preferences) throughout the business via a range of communication tools (e.g. circulated documents and cross-functional meetings) (MO4)	0.88
5 We disseminate information about competitors (e.g. competitive products and/or services, pricing, promotion campaigns, strategic moves, etc.) throughout the business via a range of communication tools (e.g. circulated documents and cross-functional meetings) (MO5)	0.91
6 We disseminate information about suppliers (e.g. manufacturing process, industry practices, clientele, etc.) throughout the business via a range of communication tools (e.g. circulated documents and cross-functional meetings) (MO6)	0.88
Responsiveness (RESP) AVE = 0.73 Composite Reliability = 0.89	
7 We respond to information about customers that it generated and/or disseminated. (MO7)	0.84
8 We respond to information about competitors that it generated and/or disseminated. (MO8)	0.87
9 We respond to information about suppliers that it generated and/or disseminated. (MO9)	0.84
Marketing resources (MR) AVE = 0.88, composite reliability = 0.97	
Marketing resources refers to the extent to which a firm possesses skills and knowledge related to marketing (mix) activities	
1 We have superior knowledge to engage in marketing activities (product, price, distribution and marketing communication) (MR1)	0.93
2 We have superior skills to engage in marketing activities (product, price, distribution and marketing communication) (MR2)	0.93
3 We have superior knowledge to engage in marketing management (market intelligence management, marketing planning and marketing implementation) (MR3)	0.94
4 We have superior skills to engage in marketing management (market intelligence management and marketing planning) (MR4)	0.93
Marketing Resource Deployment (MRD) AVE = 0.91, composite reliability = 0.98	
Marketing resource deployment refers to the extent to which a firm applies (i.e., deploys) the possessed skills and knowledge to implement marketing (mix) activities	
1 We apply available knowledge to engage in marketing activities (product, price, distribution and marketing communication) (MRD1)	0.95
2 We apply available skills to engage in marketing activities (product, price, distribution and marketing communication) (MRD2)	0.95
3 We apply available knowledge to engage in marketing management (market intelligence management, marketing planning and marketing implementation) (MRD3)	0.96
4 We apply available skills to engage in marketing management (market intelligence management, marketing planning and marketing implementation) (MRD4)	0.95
Customer-level marketplace performance (CMP) AVE = 0.50 Composite Reliability = 0.80	
Customer-level marketplace performance refers to customer-centric performance indicators	
1 Relative to our competitors, our performance with respect to achieving customer satisfaction is [. . .] (CMP1)	0.67
2 Relative to our competitors, our performance with respect to ensuring easy access to the business for customers is [. . .] (CMP2)	0.77
3 Relative to our competitors, our performance with respect to attracting customers is [. . .] (CMP3)	0.70
4 Relative to our competitors, our performance with respect to keeping current customers is [. . .] (CMP4)	0.68
	(*continued*)

Table I

Constructs and manifest variables	Loadings[a]
Firm-level marketplace performance (FMP) AVE = 0.70, composite reliability = 0.91	
Firm-level marketplace performance refers to market-centric performance indicators	
1 Relative to our competitors, our performance with respect to sales is [. . .] (FMP1)	0.87
2 Relative to our competitors, our performance with respect to market share is [. . .] (FMP2)	0.76
3 Relative to our competitors, our performance with respect to profitability is [. . .] (FMP3)	0.83
4 Relative to our competitors, our overall financial performance is [. . .] (FMP4)	0.89

Note: [a] All loadings are significant at 0.01

Table II Construct-level measurement statistics and correlation matrix

Constructs	Internal consistency	MO	MR	MRD	CMP	FMP
Market orientation behavior (MO)	0.93	**0.77**				
Marketing resources (MR)	0.97	0.44	**0.94**			
Marketing resource deployment (MRD)	0.98	0.46	0.75	**0.95**		
Customer-level marketplace performance (CMP)	0.80	0.34	0.42	0.42	**0.71**	
Firm-level marketplace performance (FMP)	0.91	0.29	0.44	0.38	0.39	**0.84**

Note: Diagonal entries show the square roots of average variance extracted, others represent correlation coefficients

customer-level marketplace performance, supporting *H1a*. In addition, the comparison between Model 4 and Model 5 shows that the positive effect of MO on firm-level marketplace performance in Model 4 becomes insignificant in Model 5 ($\beta = 0.11$, *t*-value = 1.63) after marketing resource deployment enters the model, satisfying the fourth condition. Thus, marketing resources fully mediates the effect of MO on firm-level marketplace performance, supporting *H1b*.

In *H2*, we predict marketing resource deployment mediates the effect of MO on (a) customer-level marketplace performance and (b) firm-level marketplace performance. We constructed Model 3 and Model 6 by adding marketing resource deployment to Model 1 and Model 4, respectively, and compared the models. In Model 3 and Model 6, we find that MO has a positive effect on marketing resource deployment (Model 3, $\beta = 0.45$, *t*-value = 8.50; Model 6, $\beta = 0.45$, *t*-value = 9.05), which in turn positively influences customer-level marketplace performance (Model 3, $\beta = 0.34$, *t*-value = 4.95), and firm-level marketplace performance (Model 6, $\beta = 0.32$, *t*-value = 4.62). Thus, the second and the third conditions were satisfied. When we compared Model 3 and Model 1, we also find that the positive effect of MO in Model 1 becomes weaker in Model 3 ($\beta = 0.35$ vs. 0.18), satisfying the fourth condition. Thus, marketing resource deployment partially mediates the relationship between MO and customer-level marketplace performance, supporting *H2a*. The comparison between Model 6 and Model 4 shows that the positive effect of MO in Model 4 become weaker in Model 6 ($\beta = 0.29$ vs. 0.14), satisfying the fourth condition. Thus, marketing resource deployment partially mediates the relationship between MO and firm-level marketplace performance, supporting *H2b*.

Second, we conducted Sobel's (1982, 1988) test[5] to determine whether the mediating variables carried the effect of the independent variable on to the endogenous variables. Significant *t*-values, as shown in Table III, indicate that both marketing resources and marketing resource deployment are important mediators of the linkages between MO and

customer-level marketplace performance (*H1a* and *H2a*), and MO and firm-level marketplace performance (*H1b* and *H2b*).

Finally, we examined the contribution of marketing resources, marketing resource deployment and both of them to the explanatory power of Model 2, Model 3, Model 5, Model 6 and Model 7 (full model). Specifically, we examined the increases in R^2 (ΔR^2) of customer-level marketplace performance (and firm-level marketplace performance) when marketing resources and marketing resource deployment were included in Models 2 and 3 (Models 5 and 6), respectively. The $R^2_{Model\ 2}$, $R^2_{Model\ 3}$ and $R^2_{Model\ 7\text{-}CMP}$ of customer-level marketplace performance in Models 2, 3 and 7 increase from 0.12 to 0.21, 0.12 to 0.21 and 0.12 to 0.22, respectively. The $R^2_{Model\ 5}$, $R^2_{Model\ 6}$ and $R^2_{Model\ 7\text{-}FMP}$ of firm-level marketplace performance in Models 5, 6 and 7 increase from 0.09 to 0.21, 0.09 to 0.16 and 0.09 to 0.21, respectively. As shown in Tables III and IV, $\Delta R^2_{Model\ 2}$, $\Delta R^2_{Model\ 3}$, $\Delta R^2_{Model\ 5}$, $\Delta R^2_{Model\ 6}$, $\Delta R^2_{Model\ 7\text{-}CMP}$ and $\Delta R^2_{Model\ 7\text{-}FMP}$ attributable to the mediating effect are statistically significant at 0.05.

3.7 Test of moderation: *H3*

In *H3*, we predict that marketing resources and marketing resource deployment interact to influence (a) customer-level marketplace performance and (2) firm-level marketplace performance. We tested this hypothesis using procedure suggested by Chin *et al.* (2003) and adopted by Avolio *et al.* (1999) and Eggert *et al.* (2006). First, we examined main effects by estimating Model 7 (full model without interaction effect). Second, we included the interaction variable in addition to main effects and estimated Model 8 (full model with interaction effect). Specifically, we created product indicators of the interaction variable (marketing resources × marketing resource deployment) by multiplying standardized indicators of marketing resources and that of marketing resource deployment, as in regression analysis. The results in Table IV show that the interaction term positively influences customer-level marketplace performance ($\beta =$

Table III *H1* and *H2*: Structural equation parameter estimates (*t*-value)

	Model 1	H1a Model 2		H2a Model 3		Model 4	H1b Model 5		H2b Model 6	
		Endogenous variables								
Independent variables	Customer-level marketplace performance	Marketing resources	Customer-level marketplace performance	Marketing resource deployment	Customer-level marketplace performance	Firm-level marketplace performance	Marketing resources	Firm-level marketplace performance	Marketing resource deployment	Firm-level marketplace performance
Market orientation	0.35** (6.71)	0.44** (6.79)	0.19** (3.06)	0.45** (8.50)	0.18** (2.83)	0.29** (4.93)	0.44** (7.01)	0.11 (1.63)	0.45** (9.05)	0.14* (1.93)
Marketing resources	–	–	0.34** (4.48)	–	–	–	–	0.39** (5.37)	–	–
Marketing resource deployment	–	–	–	–	0.34** (4.95)	–	–	–	–	0.32** (4.62)
R-square	0.12	0.19	0.21	0.21	0.21	0.09	0.19	0.21	0.21	0.16

Test of increases in R^2 (ΔR^2) of customer-level and firm-level marketplace performance (CMP and FMP)

$\Delta R^2_{\text{Model 2}} = 0.09^* (F_{\text{Model 2, 1, 248}} = 28.25 > F_{\text{critical}} = 3.88)$
$\Delta R^2_{\text{Model 3}} = 0.09^* (F_{\text{Model 3, 1, 248}} = 28.25 > F_{\text{critical}} = 3.88)$
$\Delta R^2_{\text{Model 5}} = 0.12^* (F_{\text{Model 5, 1, 248}} = 37.67 > F_{\text{critical}} = 3.88)$
$\Delta R^2_{\text{Model 6}} = 0.07^* (F_{\text{Model 6, 1, 248}} = 20.67 > F_{\text{critical}} = 3.88)$

Sobel t-Test
H1a: SE indirect effect = 0.040; *z*-score = 3.74, *p* < 0.01
H2a: SE indirect effect = 0.036; *z*-score = 4.22, *p* < 0.01
H1b: SE indirect effect = 0.041; *z*-score = 4.21, *p* < 0.01
H2b: SE indirect effect = 0.035; *z*-score = 4.11, *p* < 0.01

Notes: ** *p* < 0.01; * *p* < 0.05

Table IV $H3$: structural equation parameter estimates (t-value)

Independent variables	Endogenous variables $H3a$ and $H3b$							
	Model 7 (full model without interaction)				Model 8 (full model with interaction)			
	Marketing resources	Marketing resource deployment	Customer-level marketplace performance	Firm-level marketplace performance	Marketing resources	Marketing resource deployment	Customer-level marketplace performance	Firm-level marketplace performance
Market orientation	0.44** (7.01)	0.45** (8.76)	0.16** (2.43)	0.10 (1.37)	0.44** (6.45)	0.46** (8.44)	0.14** (2.47)	0.08 (1.13)
Marketing resources	–	–	0.20* (1.65)	0.33** (3.45)	–	–	0.27** (2.30)	0.42** (4.46)
Marketing resource deployment	–	–	0.21* (1.77)	0.09 (0.89)	–	–	0.19 (1.57)	0.07 (0.83)
Marketing resources X Marketing resource deployment	–	–	–	–	–	–	0.15* (1.66)	0.20*** (2.82)
R-square	0.19	0.21	0.22	0.21	0.19	0.21	0.24	0.24

Test of increases in R^2 (ΔR^2) of customer-level and firm-level marketplace performance (CMP and FMP)

ΔR^2 Model 7-CMP = 0.10* (F Model 7-CMP, 2, 247=15.83 > F critical =3.03)

ΔR^2 Model 7-FMP = 0.12* (F Model 7-FMP, 2, 247=18.76 > F critical =3.03)

ΔR^2 Model 8-CMP = 0.02* (F Model 8-CMP, 1, 246=6.47 > F critical =2.41)

ΔR^2 Model 8-FMP = 0.03* (F Model 8-FMP, 1, 246=9.71 > F critical =2.41)

Notes: ** $p < 0.01$; * $p < 0.05$

0.15, *t*-value = 1.61) and firm-level marketplace performance (β = 0.20, *t*-value = 2.82), thus supporting *H3a* and *H3b*. We find that the $\Delta R^2_{\text{Model 8-CMP}}$ and $\Delta R^2_{\text{Model 8-FMP}}$ attributable to the interaction effect are statistically significant at 0.05.

3.8 Model fit

We used the goodness-of-fit index (GoF) to assess the fit of both outer measurement and inner structural models to the data simultaneously (see Tenenhaus *et al.*, 2005). At this point, it is important to note that PLS does not optimize any global scalar function, leading to a lack of an index for global validation of the model as in covariance-based SEM such as LISREL with the χ^2-based indexes. The approach adopted here for GoF represents an operational solution to this problem and acts as a global fit index for validating a PLS path model (Tenenhaus *et al.*, 2005). This computation to GoF is a compromise between communality and redundancy where the communality index measures the quality of the measurement model for each construct and the redundancy index measures the quality of the structural model for each endogenous construct, taking into account to the measurement model (Tenenhaus *et al.*, 2005). The GoF is computed as: $GoF = \sqrt{communality \times \overline{R^2}}$. The computed GoF for the non-interaction model (Model 7) and interaction model (Model 8) were 0.39 and 0.41, respectively, indicating good fit of the models to the data (see Schepers *et al.*, 2005).

Further, we also examined Q^2 predictive relevance (i.e. predictive sample reuse technique) using the procedure outlined by Stone (1974). Q^2 statistically represents how well the observed values are reconstructed in the model (and the model parameters). $Q^2 > 0$ indicates the model has predictive relevance. Using this procedure and with omissions distances between 5 and 15, the Q^2 value for the non-interaction model (Model 7) and the interaction model (Model 8) were 0.35 and 0.27, which is indicative of satisfactory predictive relevance of the models.

4. Discussion of results

The purpose of our study was to investigate how MO, marketing resources and marketing resource deployment capability are related and what role they play in achieving firm- and customer-level performance in B2B firms. Specifically, we sought to address research gaps in the two distinct, but related, research streams of MO-firm performance (via the mediating role of marketing resources and deployment of them) and the RBV (in the context of the resource–possession deployment interaction). We pursued the argument that is now gaining ground in the literature (e.g. Murray *et al.*, 2011; O'Cass and Sok, 2012; Heirati *et al.*, 2013) that marketing resources and marketing resource deployment mediate the MO–performance link. Further, we advance theory about how resources and their deployment are complementary (interact) in their contribution to both customer-level (i.e. customers satisfaction, attraction, retention and relationship facilitation) and firm-level (i.e. sales, market-share, profitability) performance. Our findings provide empirical support for our theory and contribute to advancing B2B research on the role MO and marketing resource–capability relations in firm marketplace outcomes.

Our findings contribute to theory and marketing practice in three ways. First, our findings suggest that a B2B firm's MO does not directly or substantially enhance its performance in terms of both firm level (sales, market-share and profitability) and customer level (satisfaction, attraction, retention or relationship facilitation). Instead, MO's impact as a knowledge-based resource is largely captured by its ability to help achieve complementarity in the firm's available marketing resources–resource deployment capability process. To this end, our work extends the work of O'Cass and Sok 2012 in relation to complementarities, as we model the role of MO, which was missing from their work. In this sense, it is the complementarity in the marketing domain that drives the B2B firms' ability to achieve financial and customer level performance goals, and not MO. The firms' MO facilitates its ability to achieve complementarity and thus indirectly supports performance, a point also raised in a small body of work, especially that by Murray *et al.* (2011) and others which did not, however, have a B2B context.

Our findings of the interplay and roles of MO and marketing resource–capability in reaching specific outcomes in B2B markets is something that managers must be mindful of, as it requires careful management of both MO and the resource–resource deployment complementarity. Managers may be under the impression from the weight of literature that if they undertake the behaviors associated with MO then performance naturally follows. This could be a mistaken view based on the bulk of the literature arguing for the direct effect of MO on firm performance. On this point, we bring a greater focus on MO as a capability to generate knowledge and deploy that knowledge through the firms marketing resources–capability interactions to achieve both customer desired outcomes related to, for example, customer satisfaction and retention, as well as marketplace financial outcomes in the form of profit and sales volumes.

In particular, we show that marketing resource–resource deployment in B2B firms partially mediates the relationship between MO and firm-level performance, whereas MO partially contributes to customer-level performance. This finding extends the small body of literature, which theorizes that rather than a direct link, MO indirectly contributes to firm-level performance via mediators such as customer satisfaction, customer loyalty, product quality and innovativeness (Kirca *et al.*, 2005; O'Cass and Sok, 2012, Heirati *et al.*, 2013). Importantly, our findings support the view of Zhou *et al.* (2008) that MO is not a unique resource that directly contributes to firm performance by itself. Instead, we found that in B2B firms MO drives customer-focused strategies that require marketing resources and marketing resource deployment as the two key action components that connect the customer and the firm, and in this sense, it is a capability.

Our focus is in effect a response to a call for more research on explicating the potential "action" components that help explain how MO affects firm performance (Ketchen *et al.*, 2007). For managers, it is the action component that may prove critical in achieving not only economic rents (sales, market-share and profit) but also satisfying customers, building relationships with and attracting customers and retaining them in their business markets. Given the market

intelligence generated by their MO capability, managers may better place their emphasis on picking appropriate marketing resources and developing marketing processes to effectively deploy the marketing resources.

Second, we found that while possessing resources does explain some of the economic rent differentials (both customer-level and firm-level marketplace performance); in B2B firms, the effect depends fundamentally on how firms deploy their marketing resources. That is, the interaction between possessing marketing resources and deploying those resources produces a greater effect on customer-level and firm-level performance. Resource–possession and resource–deployment are complementary in generating economic rent return from the firms' activity. This is an extension of the work of Makadok (2001), in which resource-picking and deployment are seen as substitutes for each other in most cases, and builds more on the work by Murray *et al.*, (2011) and O'Cass and Sok (2012). Our finding on their complementarity (i.e. interaction) effect in terms of marketing resources and marketing resource deployment adds to the emerging dialogue on the creation of synergistic performance impact via the combination of resources and capabilities such as marketing capability and technology capability (Song *et al.*, 2005), MO and innovativeness (Menguc and Auh, 2006) and MO and marketing capability (Morgan *et al.*, 2009; Murray *et al.*, 2011; O'Cass and Sok, 2012). For managers, investments in both marketing resources and marketing resource deployment capabilities should not be seen as a tradeoff. Instead, managers have strong incentives to cultivate complementarity between marketing resources and marketing resource deployment capabilities, as well as manage their firms' MO capability.

Third, our findings guide resource-based scholars that investigation of the relationship between resources, resource deployment and firm performance (especially cross-level marketplace performance) should be conducted at the business process level within firms. Our findings suggest that the considerable body of research on MO (as well as other business orientations) and resources and their deployment can be used for greater exploration of the resource–possession and resource–deployment logic at the business process level. It is this pursuit that will prove fruitful for B2B firms. By unlocking the interplay between MO, resources and capabilities managers will be in a better position to understand what objectives can be achieved with the available resources and capabilities held within the marketing function. These should be configured with the level of market intelligence generated to ensure effective investments in marketing resource picking and deployment. Similar synergic performance effects may also occur in other functional areas including R&D and sales. Thus, this study suggests the need for managers to pay attention to achieving resource–resource and resource–deployment complementarity across different functional areas.

5. Limitations and future research

There are several limitations in the study that warrant discussion. First, this study relied on self-reporting by marketing executives in B2B firms. The interpretation of the findings is limited because of the self-reported measures.

Second, while a cross-sectional design was used, inferences about causality should be made with caution. Specifically, the time sequence of the relationships among resource possession and resource deployment and marketing results (i.e. effectiveness in achieving firm and customer marketplace performance) cannot be determined unambiguously. This limitation is common to research in strategic marketing utilizing cross-sectional research designs (see Homburg *et al.*, 2008; Homburg and Jensen, 2007; Jaworski and Kohli, 1993). A longitudinal study would overcome this limitation and make the results more robust. A further limitation derives from the use of subjective measures of firm performance. While such measures are common practice because of the resistance of companies to provide quantitative data on sales, market share and profits, this does not limit the need to be careful when interpreting conclusions drawn from the measures we deployed. Finally, the sampled companies were limited to B2B firms located in three major cities on the east coast of Australia; therefore, other countries should be studied.

Future research to test the measures and model predictions against real market outcomes should be undertaken. In this sense, objective (financial) measures could be used to complement self-reports by managers. This dual approach to measuring the marketing effectiveness (as well as actual resources) would provide additional insights into the RBV. Likewise, longitudinal data may provide a means for evaluating actual marketing effectiveness and its link to resources and their deployment. In addition, it would be advisable to attempt to develop a more comprehensive measurement of resources and deployment. In developing the measures, we sought to be as parsimonious as possible, and assessed largely general perceptions of resource possession. We would advise that a comprehensive assessment of all possible resources be undertaken, as well as deployment capabilities.

Further, this study used single source data. The measures were based on the subjective views of a single respondent in each firm. This approach is a potential source of common method bias. In acknowledging the limitation of single source data, future research might consider data collection procedures that help reduce the risk of same-source biases, such as multiple source data collection procedure. Further, even though there was no evidence of common method biases, a research design of multiple respondents (e.g. CEOs and other senior executives) might be the most desirable data collection procedure in future research.

Notes

1 Such resources must fit within the VRIN criteria suggested by Barney (1991).

2 The prescreening of the respondents ensured surveys were sent to those who were responsible for the marketing within the firm and that the respondent was confident they could accurately answer the survey.

3 As part of the instructions, respondents were informed in the survey what constitutes resources based on a short description of the nature of resources using the VRIN criterion and a set of example resources. Based on their own assessment of their possessed resources, they then

completed the survey items corresponding to resource possession.

4 As part of the instructions, respondents were provided with a short description of resource deployment and then asked to complete the items relating to deploying marketing resources.

5 Sobel (1982, 1988) provided an approximate significance test for the indirect effect that included three variables $(X_1 \rightarrow X_2 \rightarrow X_3)$ as follows: a and b are the path coefficients for the direct effects of $X_1 \rightarrow X_2$ and $X_2 \rightarrow X_3$, respectively. SE_a and SE_b are denoted as the standard errors. The standard error of the indirect effect (the product ab) is: $SE_{ab} = SQRT[(b^2 SE_a^2 + a^2 SE_b^2 + SE_a^2 {}^* SE_b^2)]$.

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