The effectiveness of market orientation in the logistic industry: A focus on SMEs in an emerging country

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A R T I C L E   I N F O

A B S T R A C T

Although the interrelationship between market orientation, innovation, and performance has been intensively examined in the literature, there is a lack of understanding of this in the contexts of small and medium enterprises (SMEs) operating in Vietnamese logistic industry. Thus, this study aims to draw upon the resource-based view to examine the mediating effects of incremental and radical innovation on the link between market orientation and organizational performance. Data collected from 153 logistic SMEs in Vietnam were used to assess the proposed model. Partial least square structural equation modelling was used to examine data. The results suggest that incremental and radical innovation partially mediate the link between market orientation and organizational performance. In this regard, this study contributes to logistic literature by showing the antecedents and consequences of innovation. In addition, this study contributes to market orientation literature by assessing the consequences of market orientation in Vietnam. This study also contributes to the refinement of resource-based view. Finally, this study also provides practical implications for managers manage logistic SMEs in Vietnam.

1. Introduction

Logistic enterprises specialize in the provision of logistic services, which assist their customers to manage supply chain functions including warehousing, distributions, and transportations. Among the competition between logistic enterprises, developing a long-term relationship with the customers permits high-quality services to gain superior performance. Without this development, logistic services nowadays fail to meet the customers' increasing demands of a broader range of these services [1]. Thus, it drives logistic enterprises to search for practices, which permits them to develop this relationship to gain performance.

Some researchers suggest a marketing practice in the search for practices, which possibly allows a strong development with customers. In particular, market orientation (MARO) is a marketing concept, which refers to the degree to which organizations focus on the customers' needs, which results in the strong development of the relationship with the customers [2]. One reason is that adopting this practice allows organizations to enhance their relational capabilities and, as such, improves performance [3,4]. To explain the positive effect of MARO, drawing from the resource-based view, it is argued that this orientation is an intangible resource that encourages competitive advantages [5]. In this regard, Slater and Narver [6] argued that MARO induces superior performance.

In logistic contexts, MARO can be adopted by logistic enterprises. Due to the high need for integration, logistic functions are in a position that easily exerts many market-oriented behaviors [7]. Logistic contexts provide unique opportunities for examination of MARO because it is suggested logistic enterprises plays as the "middleman" in the logistic channels, which requires logistic enterprises

to serve suppliers, manufacturers, and customers [8]. Therefore, recently, logistic researchers have started to examine the beneficial effects of the adoption of this practice on performance of large logistic enterprises [9].

In addition to performance, this study also examining the effects of MARO on innovation. In the logistic industry, innovation is one of the crucial phrases of the services' value co-creation in logistic contexts, which results in competitive advantages [10]. Due to the unique character of the logistic outsourcing industry, logistic enterprises rely on external relations to acquire knowledge to find innovation [1] and, as such, improves performance. Because of the crucial role of innovation, logistic researchers have begun to question the determinant of innovation of logistic enterprises [11]. The literature of MARO may provide the answer because it induces service enterprises to improve innovation and as such results in performance implications [12]. Moreover, innovation is varied in degree based on novelty and can be distinguished into two types, incremental innovation (INCR) and radical innovation (RADI) [13]. And they were shown to be crucial to logistic enterprises [14]. Therefore, the effects of MARO on INCR and RADI should be taken into account when examining logistic industries.

Although, it is a strong consensus that MARO enterprises to exert three separated behaviors, which collectively creates innovation and improves performance [15], there are two concern relating to the MARO adoption of logistic SMEs. The first concern that the adoption of MARO in small and medium enterprises (SMEs) is different in large enterprises [16–18]. For instance, SMEs have a lack of capabilities in comparison to large enterprises [19]. The adoption of MARO requires SMEs to have capabilities to exploit it [20]. Therefore, Sapienza [21] argued that the effects of MARO on its consequences should be examined in SMEs separately because the characteristics of marketing-oriented activities in SMEs are different in large enterprises.

The second concern is that the effects of MARO varies when contexts taken into account. Regarding to the relationship between MARO and performance, prior studies indicate the mixed result. In manufacturing contexts, Amin et al. [22] and Jangl [23] found significantly direct relationship in food and beverage industries, and high-tech manufacturing industries while Ho et al. [24] and Gaur et al. [25] found insignificant relationship in beef cattle industries and manufacturing industries. In service contexts, Jogaratnam [26] and Vega-Vázquez et al. [27] found the significantly direct relationship in restaurant and hotel industries while Mahmoud et al. [28] and Alan [29] found no direct relationship in banking and property industries.

Relating to the relationship between MARO and innovation, prior empirical evidences are also mixed. For example, in the manufacturing contexts, Vázquez et al. [30] and Liu and Su [31] showed the positive relationship between MARO and innovation while Al Idrus et al. [32] and Hutahayan [33] indicated the non-significant relationship. In addition, Naidoo [34] Hutahayan [33] and Yadav et al. [35] found empirical evidence partially supporting this relationship in manufacturing contexts. In service contexts, Chou et al. [36] and Mahmoud and Hinson [37] indicated the positive relationship in restaurant and telecommunication industries while Atuahene-Gima [38] found insignificant relationship in the service samples. In addition, the results from the studies of Camarero and Garrido [39], Ghantous and Alnawas [40] and Na et al. [41] partially support this positive relationship in museum, hotel, and sharing economy industries.

In addition to two mentioned concerns, this study also questions about the impact of INCR and RADI on OP of logistic SMEs. One reason for this concern is due to the mixed results from prior studies when examining the relationship between innovation and performance of SMEs operating in various contexts. For example, in manufacturing contexts, Yadav et al. [35] indicated the negative relationship while O'Cass and Weerawardena [42] shows the positive relationship. In service contexts, Kim and Shim [43] showed the positive relationship while McDermott and Prajogo [44] found empirical evidence partially supporting this relationship.

Han et al. [12] and Carmona-Lavado et al. [45] argued that the link between innovation and performance depends on studying contexts. Furthermore, Campo et al. [46] argued that different types of innovation caused mixed impacts on industry performance. In each industrial context, a specific type of innovation is more important than other types of innovation. As a result, some types of innovation have more impact on performance than others. For instance, Aboal and Garda [47] found that technological innovation is valuable for manufacturers to improve productivity, while non-technological innovation allows service providers to improve productivity. Among service providers, the degree of technology orientation impacts. Service providers operating in transportation industries rely more on technology, and technological innovation is required to improve their service quality by reducing costs and enhancing on-time delivery rates to meet customers' demands [48]. Non-technological innovation, on the other hand, is more common in service providers such as hotels and restaurants [49] because, in low-tech service providers, successful innovation implementations require a high degree of service interaction between these providers and customers [50].

In logistic SMEs contexts, some contradicting arguments relate to the link between innovation and performance. Logistic SMEs operate in transportation industries, and as a result, these providers rely on technological innovation to gain performance implications. However, SMEs are less likely to benefit from technological innovation because they need more R & D capabilities and financial resources [51]. They question the impact of innovation on the performance of logistics providers. Furthermore, service providers implement both technological and non-technological innovation at the same time [47]. The classification of innovation according to the degree of novelty is more comprehensive because it covers both technological and non-technological innovation in a single concept, such as INCR and RADI. It overcomes the limitation of prior studies focusing on one type of innovation.

Last but not least, when examining the impact of MARO on innovation and performance, researchers in the service industry call for more studies examining the mediating role of innovation on the link between MARO and the performance of service providers [52]. Examining the mediating effects allows researchers to gain insight into the underlying mechanism which permits MARO to improve performance via innovation.

Thus, this study purpose is to draw upon resources-based view to sheds light on the mediating effects of INCR and RADI on the relationship between MARO and organizational performance (OP) of logistic SMEs. Data collected from logistic 153 logistic SMEs currently operating in Vietnam was used to test the hypotheses. This study focuses on Vietnam due to two following reasons. First, the Vietnamese economy is considered a market-oriented economy since the government implements *Doi Moi* (Renovation), an economic

reform policy [53]. Second, SMEs are dominant in the Vietnamese economy [54]. In this regard, the relevance of MARO in the context of logistic SMEs is assurance.

This paper is outlined as follows. The second and third sections provide theoretical background and hypothesis development, as well as the methodology used in this study. After that, the result section is indicated. Next, the fifth section discusses the results. The last section is to conclude, provide practical implications, reveal the limitations and future research.

2. Theoretical background and hypothesis development

2.1. Theoretical concepts

2.1.1. Resource-based view

This study borrows the resource-based view to explain the relationship between MARO, INCR, RADI and OP. This view was also borrowed by prior logistic researchers to explain how organizational resources and capabilities permits high performance [55,56]. The resource-based view argues that organizations sustain their competitive advantages when they have resources which are valuable, rare, difficult to imitate, and non-substitutable in the market [57]. In this regard, this view supports that both organizational resources are determinants of performance [58]. In addition, the resource-based view of innovation specifies that organizational resources also determine the capacity to innovate, which results in highly competitive advantages [59]. MARO theorists suggested that MARO is intangible resources, which are rare, valuable, and inimitable organizational resources [60,61]. In this regard, according to the resource-based view, this study posits that MARO can allow logistic SMEs to enhance the degree of INCR and RADI and, as such, leads to OP. The proposal of the research model is shown in Fig. 1.

2.1.2. Market orientation

MARO is a marketing concept that has been extensively examined in various literature. It was conceptualized as the effective and efficient behaviors required to exert to create values for the customers and, in turn, continuously gain superior performance [2]. As a result, MARO consists of three behavioral components, including customer orientation, competitor orientation, and inter-functional coordination [62], which link to innovativeness [63]. Prior studies [22,64,65] refers to this variable as a second-order construct consisting of three mentioned dimensions. Therefore, this study follows this concept of MARO as the second-order construct.

Service enterprises exert strong MARO behaviors [66]. Therefore, logistic enterprises are expected to strongly exert those behaviors. Particularly, it is argued that the logistic function is in a position to foster market-oriented behaviors for an organization [7]. In logistic functions, there is a high need for internal and external integration in order to gain competitive advantages [67]. Internal integration refers to logistic activities across functional areas within an organization, while external integration concerns logistic activities across the organizational boundary (e.g., customers and suppliers) [68]. A high degree of integration requires the logistic function to interact with parties not only within but also beyond the organization and, as such, generates market intelligence [69]. First, the intelligence about customers permits a high understanding of customers' needs. Second, the intelligence about competitors induces the predictability of competitors' future actions and moves. Third, cross-functional collaboration allows the logistic function to dissimilate this intelligence throughout the organization [70]. In this regard, activities in logistic function foster market-oriented behaviors across the organization. Because logistic enterprises are organizations specializing in offering logistic services, it is expected that these offers induce market-oriented behaviors of these enterprises.

2.1.3. Incremental and radical innovation

Innovation can refer to the novel ideas, practices, or objects of an organization [71]. Innovation also refers to the modification of the current products/services and development of new products/services to meet customers' demand [72,73].
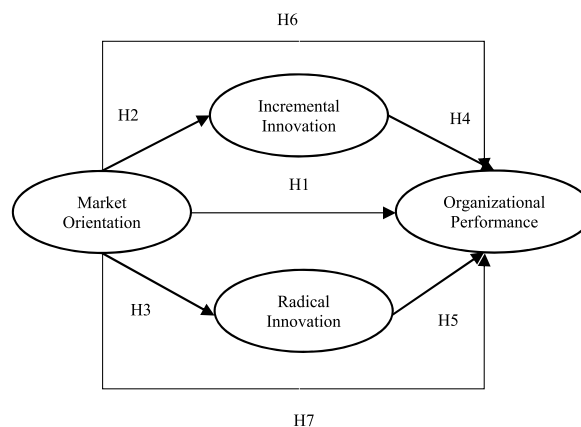

Fig. 1. Proposal of the research model.

Innovation has a positive impact on organizations. The literature indicates that innovation increases market share, product efficiency, productivity growth and revenue [74]. Innovation also permits the enhancement of financial performance [75]. Innovation is shown to determine competitive advantages [76]. Therefore, most innovation scholars generally accept that innovation has beneficial effects on organizations.

Innovation can be classified according to the aspects and the degree of novelty. When examining the innovation aspects, there are various types of innovation as business, business model, communication, managerial, management, marketing, technological, organizational, product, process innovation [32,34,36,39,41,77].

Scholars also assess innovation based on the degree of novelty [78]. When examining the different degree of novelty, two distinctive types of innovation as INCR and RADI should be taken into account [79]. INCR refers to the minor changes or extensions of the existing products/services [80], while RADI focuses on the development of new products/services through the significant implementation of new technologies or ideas, which never existed before [81]. The literature refers to INCR as exploitative innovation and RADI as exploratory innovation [82,83]. Wang et al. [84] indicated that these two types of innovation are found in manufacturing and service SMEs.

SMEs are referred to be innovative organizations [85]. One reason is that these organizations have flexible structures, which fosters innovation activities [86]. As a result, they are capable of the creation, transfer and exploitation of innovations more than larger ones [87]. Success in innovation allows these organizations to stand out from the competition and, as such, sustain performance [88]. However, Expósito and Sanchis-Llopis [85] showed that prior empirical results are mixed and inclusive. One explanation is that these organizations are lack resources, and innovation requires a major amount of resources to innovate [89]. In addition, successful innovators also require special capabilities to gain performance implications [90] and SMEs have a lack of these capabilities [19]. Therefore, scholars urged more research should be done to gain insight into the relationship in the context of SMEs [85,91,92].

In the logistic context, innovation is crucial for logistic enterprises to gain competitive advantages [55]. In this context, there are two types of innovation, INCR and RADI [14]. The first type refers to the creation of extra value through the improvement of the current ways of delivery, while the second one is the creation of new services through initiating new ways of delivery [93].

2.2. Hypothesis development

2.2.1. The relationship between MARO and OP

As mentioned earlier, although the prior results are mixed, this study expects the positive relationship in logistic contexts. The direct relationship between these two variables was described in the prior studies based on the resource-based view [5,27]. This view states that organizational resources, which are valuable, rare, inimitable by the competitors, and non-substitutable in the market, allow organizations to gain competitive advantages and, in turn, improve their OP [58]. According to this view, MARO refers to intangible resources, which allows the organization to find OP implications [27,94]. Particularly, MARO consists of a set of behaviors, including customer and competitor orientation as well as inter-functional coordination [95]. First, customer and competitor orientation allow the organization to gain insight into the customers' demands as well as competitors' behavior [96]. In this regard, logistic SMEs can deliver their services to meet customers' demands. Besides, the deep understanding of competitors' behavior allows logistic SMEs to develop their contingency plans, which allows the organizations to act ahead to gain competitive advantages. Therefore, MARO equips logistic SMEs with in-depth knowledge of the market, which is valuable, difficult to identify and reproduce by competitors in the market [cf. 27]. Second, inter-functional coordination allows all internal functions within logistic SMEs to take advantage of this knowledge and, as such, cooperate with each other to achieve the goals [cf. 95]. In this regard, it allows logistic SMEs to take advantage of this knowledge to sustain their competitive advantage. In summary, it is expected that logistic SMEs can find competitive advantages, which leads to high OP. Thus, the first hypothesis is as follows.

H1. In the context of logistic SMEs, there is a positive direct relationship between MARO and OP

2.2.2. The relationship between MARO and INCR and RADI respectively

This study expects that MARO induces INCR and RADI of logistic SMEs. From the marketing literature, MARO refers to the innovative behavior of the organization [28]. It is found that both INCR and RADI is relevant in the logistic industry [14]. Therefore, three behavioral components of MARO can lead to INCR and RADI. The first dimension of MARO is customer orientation. This orientation allows a deep understanding of customers' manifest needs, and as such, organizations satisfy them [97] through delivering their services meeting those needs. The improvement of INCR can be achieved through the satisfaction of these manifest needs [98]. Therefore, customer orientation permits logistic SMEs to gain insight into customers' manifest needs, and as a result, they can improve existing ways to deliver logistic services to customers, which results in a high degree of INCR. In addition, organizations possessing customer orientation gain insight into not only the latent needs but also expressed needs [60,99,100]. This insight allows logistic SMEs to observe the customers' problems relating to the current services, and in turn, they can create solutions to these problems. This creation offers logistic SMEs opportunities to create new ways of deliver of logistic services to customers, which results in RADI.

Competitor orientation can refer as the source of INCR and RADI of logistic SMEs. One explanation is that high competitor orientation allows the organization to gain insight into competitors' capabilities and strategies [101]. This allows organizations to react actively and respond to their competitors, and as a consequence, they find differentiation advantages [102] by delivering services that are different from their competitors' services. For example, competitor orientation allows logistic SMEs to gain insight into competitors' ability to provide logistic services. Thanks to this insight, they can modify their services, which is different to competitors' ones. According to Brown [103], INCR can be found when organizational services are different from other services available in the

market. As a result, competitor orientation permits logistic SMEs to find INCR. Furthermore, Atuahene-Gima [104] argued that a deep knowledge of competitors leads to the dissatisfaction of the capabilities of their own and competitors, which leads to the investment of new capabilities, and as such leads to RADI. In this regard, competitor orientation induces knowledge of competitors' logistic services. A high degree of this knowledge causes Logistic SMEs to dissatisfy their ability to offer logistic services as well as competitors' ones, and in turn, they invest in new capabilities. Thanks to these capabilities, logistic SMEs can create new ways of delivering logistic services through the improvement of RADI.

Lastly, inter-functional coordination permits the dissemination of the knowledge and the corporation between functions within the organization [101]. It allows different functional areas within the organizations to communicate, collaborate, which allows them to enhance trust and commitment [105]. Consequently, it promotes an organizational culture inducing innovative thinking and ideas among employees working in different functions [106]. The role of inter-functional coordination is to foster the sharing of market information, which is crucial for innovation initiated during the service development [107]. In this regard, it may expect that inter-functional coordination encourages the dissemination of market intelligence relating to logistic services between functions within Logistic SMEs. A high degree of this coordination improves the exchanges of this intelligence not only with logistic SMEs but also between these enterprises and other parties in supply chains, and as a consequence, they can improve the degree of innovation in their logistic services. In this regard, inter-functional coordination supports the enhancement of INCR and RADI during the development of logistic services. In summary, because three components of MARO induce INCR and RADI, it can be expected that when adopting MARO, Logistic SMEs find the improvement of INCR and RADI. Thus, the second and third hypotheses are proposed as follows.

H2. In the context of logistic SMEs, there is a positive direct relationship between MARO and INCR.

H3. In the context of logistic SMEs, there is a positive direct relationship between MARO and RADI.

2.2.3. The relationship between INCR and RADI respectively and OP

Because innovation has many types. It can be classified according to the degree of novelty. It is a concern that one type is more beneficial than others [108]. It is crucial to examine each type of innovation on performance [109]. Addressing this, this study examines two types of innovation based on the degree of novelty, namely INCR and RADI. This examination is sufficient because they were examining previously in a logistic study [14]. The following paragraphs indicates why INCR and RADI have a positive impact on OP in the context of logistic SMEs.

INCR is the exploitative approach of innovation, which allows the enhancement of existing services through the application of the existing knowledge and skills [82]. This innovation focuses on responding to the current needs of customers and the market and, as such, improves existing services [110]. INCR leads to the significant improvement of services [111]. The provision of services, which has a lower price than competitors in the market, allows the improvement of market share. As a result, Hoonsopon and Ruenrom [112] indicate that INCR leads to improvement of market performance and, in turn, improves OP.

RADI is the exploratory approach of innovation because it allows the discovery of entirely new markets [113]. Therefore, this approach emphasizes the search and discovery of new knowledge and skills to gain the radical changes of their services, which in turn defines and creates new markets [82]. Because of the new knowledge and market creations, this approach leads to the improvement of cash flow and overall OP [114]. One proper explanation for this improvement is as follows. RADI improves the rate of new services delivered to the market [115]. This delivery allows organizations to gain differentiation advantages because their new services are unique in the market [116]. These advantages allow the sustainability of performance implications [117].

Based on these arguments, this study expects that both INCR and RADI allows logistic SMEs to gain OP. Particularly, a high degree of INCR permits logistic SMEs to improve their existing logistic services to customers. One possible consequence of INCR is that Logistic SMEs can provide services, which is lower prices than their competitors [118], and as a result, results in the expansion of the market shares. The improvement of market shares is one of the indicators for the OP implications of Logistic SMEs. In addition, RADI improves the introduction of new logistic services. Thank this innovation, logistic SMEs can enhance the unique degree of their logistic services. Because a high degree of service uniqueness is a sign of differentiation advantages, logistic SMEs can sustain their OP. Taken together, this study proposes the fourth and fifth hypotheses as follows.

H4. In the context of logistic SMEs, there is a positive direct relationship between INCR and OP.

H5. In the context of logistic SMEs, there is a positive direct relationship between RADI and OP.

2.2.4. The mediating effects of INCR and RADI on the link between MARO and OP

The link between MARO and performance is inclusive [119]. For instance, prior studies [22,27,64] reveal that MARO permits performance implication while Demirbag et al. [120] and Keskin [121] found that MARO has no direct influence on performance. As a result, MARO scholars argued that indirect relationships should be taken into consideration when examining the effects of MARO on its consequences [52,122].

An indirect assessment is required when the relationship between two variables is not clear. It sheds light on the underlying mechanism by which independent variables affect dependent variables through mediators. In MARO studies, mediating assessment is common. For example, past studies have identified various mediators of the relationship between MARO and performance [28,62, 123–126].

In line with prior studies, this study expects the mediating effects of INCR and RADI on the relationship between MARO and OP. This expectation is appropriate because of the following reasons. Hult et al. [127] and Morgan et al. [5] argued that MARO only has a

determining factor of performance when it is combined with other performance antecedents. Similarly, it is suggested that MARO requires complementary capabilities of organizations to foster its positive effects [128]. Innovation is a capability permitting SMEs to address the environmental changes and results in performance implications [129]. Therefore, Slater and Narver [6] stated that innovation is a capability that allows organizations to take full advantage of MARO to gain performance implications. Wang [130] and Han et al. [12] suggested the link between MARO - innovation - performance should be examined. With this logic, prior studies [12,28, 36,37] indicate that innovation is a mediator of the relationship between MARO and performance of service organizations. Hence, this study proposes the last two hypotheses as follows.

H6.   In the context of logistic SMEs, INCR mediates the relationship between MARO and OP.

H7.   In the context of logistic SMEs, RADI mediates the relationship between MARO and OP.

3. Method

3.1. Data collection

Vietnam is an emerging country located in South East Asian, one of the most dynamic area in the world. This country is a one of the most fastest growing economies in the world [131]. Before the Covid-19 pandemic, the GPD growth is about 6% annually for more than two decades [132]. It is also consistently considered as one of the most investment destinations [133]. It is due to the implementation of Doi Moi, a market-oriented policy since the eighties [53]. This policy encourages Vietnamese enterprises to exert more market-oriented behaviors.

The Vietnamese government sets an ambitious goal to promote international trades, and as a result, the logistic industries plays a crucial role on national competitive advantages to gain such goal [134]. Consequently, the growth rate of logistic services is between 16% and 20% recently [135]. And, the revenue of logistic services is accounted for USD 4,1 billion in 2019 [136]. The majority of the contribution is from logistic SMEs because there are about 38,000 logistic SMEs in Vietnam according to General Statistical Office [137]. Logistic enterprises can be categorized as SMEs when they employ less than 200 employees. Because of this contribution, logistic SMEs operating in Vietnam is under the scope of this study.

Due to the lack of financial resources to perform a large-scale survey, this study relies on a database of a private seller. Particularly, similar to prior studies [138,139], a dataset of 1500 Logistic SMEs was randomly selected from a database consisting of 250,000 enterprises in Vietnam. This dataset was bought from a private agent. The collecting process is as follows. An email was sent to the target respondents. In this email, there is a descriptive introduction of the study's purposes and a link to access the online survey (e.g., Google form). In the survey, there are three parts. The first part is the introduction. The second part is two constraint questions, which asks whether the respondents are the managers and whether their organizations operate in logistic industries. The third part is the main survey, and the fourth part asks respondents to indicate the characteristics of their enterprises. The last part asks the respondents to indicate their email addresses whenever they want the results of this research.

The collecting process began in the August of 2020. At the beginning of this month, an email address was sent to 1500 email addresses. After two months, it was revealed that 157 respondents completed the survey. 4 observations were removed due to the majority of missing values. Thus, 153 observations were used for the analysis. The response rate is 10.46% (157/1500).

3.2. Measures

Because the questionnaire was originally in English, the translation into Vietnamese was performed. After the translation, two managers of logistic SMEs were requested to examine the Vietnamese version of the questionnaire. The feedback from these two managers was adapted, and the questionnaire was revised. The purpose of this process is to ensure the readability and accuracy of the translation.

All variables used in this study are measured in 5 point Likert scales. The respondents were asked to indicate their agreement on the item statements (see Appendix).

This study adopts an instrument from the study of [2] to measure the degree to which Logistic SMEs adopt MARO. It is modelled as a reflective second-order construct [65]. There are three dimensions in this instrument, which are customer orientation (CUSO), competitor orientation (COMO), and inter-functional coordination (INCO). This instrument poses high reliability because it was used in the contexts of SMEs [63].

Two instruments from the study of Wang et al. [84] were adopted in this study to measure the degree of INCR and RADI of logistic SMEs. These instruments were used in the context of SMEs operating in both manufacturing and service contexts. Because the main aim of logistic enterprises is to provide logistic services, and hence, it is sufficient to use to measure the degree of INCR and RADI of logistic SMEs.

This study operationalizes OP as a single construct, which consists of financial and non-financial performance. Due to the unavailable of subject data, this study relies on the instrument of Prieto and Revilla [140] to measure financial (e.g., the first five items) and non-financial performance (e.g., the last five items). This instrument was used in the contexts of SMEs [141], and therefore, it is sufficient to use for Logistic SMEs.

This study uses two control variables, ages and sizes, for OP. The first variable (EAGE) is measured by the year since the Logistic SMEs were found. The second variable (EMPL) is measured by the number of employees.

3.3. Evaluation of common method bias

Podsakoff et al. [142] argued that collecting data in the same survey may lead to common method bias. Thus, Harman's single factor test was examined whether or not this bias creates a concern. In this test, if a single factor accounts for more than 50% of the total variance, common method bias is present [143]. The results indicate that one factor only accounts for 26.429% variances. Therefore, the results can be interpreted without the concern of this bias.

3.4. Analytical procedure

This study uses partial least square structural equation modelling (PLS-SEM) to assess the research model. It aims to maximize the total variance explained to estimate the complex cause-effect relationship between latent variables [144]. In this assessment, there are two stages, which are required to evaluate [145]. The assessment of the measurement model requires the evaluation of indicator loadings, internal consistency reliability, the convergent validity of each construct measure, and discriminant validity [146]. The assessment of the structural model requires the examination of collinearity, the model's explanatory power, and predictive accuracy [146]. SmartPLS 3.2.8 was used to assess the PLS-SEM model.

Regarding to sample sizes, there are many approaches used to determine the required sample size in PLS-SEM analysis. For instance, Barclay et al. [147] proposed the 10-time rule. This rule is widely accepted in PLS-SEM analysis [148]. This rule suggests that the minimum observations should be equal or larger than 10 times the largest number of the arrow pointing to any particular latent variables in the measurement or structural model [149]. From this rule, the required observations of this study are 100. However, this rule is criticized due to the inaccurate estimation [148,150]. Kock and Hadaya [148] proposed a new approach, the gamma-exponential method, to determine the minimum sample size in the analysis by Monte-Carlo simulations. According to this approach, when researchers do not know the path coefficient in advance, the minimum observation is 146 [151]. In addition, according to Hair et al. [150], the minimum observation of the sample size should be estimated by statistical powers to detect minimum R^2 at a specific level of significance. Based on the power table [150], the minimum observations are 53 to achieve a statistical power of 80% for detecting at least 0.10 R^2 values (with a 5% probability of error) when there are three independent variables in the measurement and structural models. Taken together, 153 observations in this study's sample are sufficient.

Table 1
Loadings and cross-loadings.

	COMO	CUSO	EAGE	EMPL	INCO	INCR	RADI	OP
COMO_1	**0.849**	0.539	0.072	−0.031	0.581	0.188	0.293	0.151
COMO_2	**0.848**	0.593	0.051	−0.053	0.622	0.189	0.191	0.268
COMO_3	**0.816**	0.576	0.040	0.033	0.579	0.074	0.158	0.091
COMO_4	**0.831**	0.575	−0.015	0.027	0.533	0.148	0.283	0.305
CUSO_1	0.585	**0.820**	−0.004	0.024	0.602	0.167	0.255	0.167
CUSO_2	0.590	**0.843**	−0.100	−0.039	0.588	0.194	0.243	0.210
CUSO_3	0.588	**0.821**	0.047	−0.054	0.620	0.222	0.255	0.212
CUSO_4	0.624	**0.873**	−0.046	−0.076	0.633	0.176	0.327	0.240
CUSO_5	0.404	**0.690**	−0.039	−0.052	0.467	0.052	0.291	0.194
CUSO_6	0.411	**0.683**	−0.090	−0.082	0.494	0.046	0.185	0.114
EAGLE	0.044	−0.046	**1.000**	0.210	0.083	0.046	−0.027	0.166
EMAIL	−0.008	−0.057	0.210	**1.000**	−0.034	−0.049	0.029	0.074
INCO_1	0.622	0.636	0.138	−0.063	**0.851**	0.204	0.185	0.303
INCO_2	0.611	0.673	0.078	0.002	**0.885**	0.205	0.179	0.300
INCO_3	0.445	0.464	0.004	0.020	**0.700**	0.140	0.176	0.088
INCO_4	0.293	0.374	−0.047	−0.071	**0.607**	0.065	0.059	0.029
INCO_5	0.672	0.632	0.098	−0.030	**0.859**	0.149	0.204	0.299
INCR_1	0.153	0.212	0.077	−0.020	0.257	**0.901**	−0.031	0.319
INCR_2	0.159	0.115	0.042	−0.082	0.092	**0.859**	−0.085	0.262
INCR_3	0.153	0.135	−0.041	−0.028	0.126	**0.791**	−0.093	0.122
RADI_1	0.258	0.316	−0.056	−0.049	0.190	−0.065	**0.863**	0.230
RADI_2	0.217	0.250	−0.019	0.012	0.167	−0.045	**0.887**	0.253
RADI_3	0.287	0.257	0.013	0.084	0.185	−0.018	**0.824**	0.204
RADI_4	0.143	0.279	−0.027	0.065	0.163	−0.130	**0.771**	0.135
OP_1	0.300	0.176	0.084	0.067	0.271	0.224	0.260	**0.733**
OP_10	0.209	0.146	0.074	−0.007	0.193	0.219	0.162	**0.789**
OP_2	0.197	0.229	0.151	0.064	0.253	0.271	0.228	**0.819**
OP_3	0.181	0.178	0.042	−0.065	0.246	0.135	0.238	**0.745**
OP_4	0.089	0.125	0.052	0.073	0.124	0.129	0.191	**0.775**
OP_5	0.138	0.121	0.130	0.113	0.095	0.090	0.107	**0.530**
OP_6	0.143	0.183	0.099	0.140	0.168	0.266	0.160	**0.840**
OP_7	0.240	0.291	0.272	0.080	0.316	0.335	0.210	**0.820**
OP_8	0.104	0.067	0.107	0.061	0.167	0.153	0.074	**0.634**
OP_9	0.168	0.197	0.150	0.031	0.201	0.282	0.201	**0.847**

3.5. Ethical consideration

This study believes that the ethical committee approval does not apply to this study because of the following reasons. First, this study is a management study rather than a medical study. In this regard, this study is less likely subject to the Declaration of Helsinki. Second, this study examines the characteristics of Logistic SMEs rather than managers. Thus, this study surveys on Logistic SMEs, and as such, an ethical review is not required. Lastly, the personal information of the respondents is not revealed due to the scope of the study (see questionnaire).

Relating to informed consent, the managers have received only an email asking them to voluntarily participate in the research. This study uses a Google form to collect data. In the introduction, the managers can find information about the research's goals. In addition, they were also informed that their responses were anonymized throughout the survey.

4. Results

4.1. Measurement model

This study uses a two-stage approach to assess the measurement model [152]. The first stage is to assess first-order constructs, including COMO, CUSO, INCO, INCR, RADI, and OP. The second stage is to evaluate the second-order construct, which is MARO.

4.1.1. Evaluation of first-order constructs

According to Table 1, indicators such as CUSO_5, INCO_3, INCO_4, OP_5, and OP_8 were removed because their loadings are below the threshold value of 0.708 [146].

The internal consistency reliability of the constructs was assessed using Cronbach's alpha and composite reliability. These values are all higher than the recommended values of 0.7 [144]. Table 2 suggests that the satisfaction of this reliability is established.

The convergent validity was examined by using average variance extracted (AVE). AVE higher than the 0.5 thresholds suggests satisfaction [146]. Table 2 indicates the establishment of this validity.

The discriminant validity of the constructs was assessed by examining the heterotrait-monotrait (HTMT) ratio of the correlation. This value needs to be lower than 0.85 [153] to indicate the establishment of this validity. According to Table 3, these values are all lower than 0.85. Thus, discriminant validity is established.

4.1.2. Evaluation of second-order constructs

In this stage, MARO was assessed. To do this, the latent variable scores of these first-order constructs (COMO, CUSO, INCO) were obtained from the first stage using SmartPLS. Next, MARO was measured by three indicators which are COMO, CUSO, and INCO. It also noted that three first-order constructs, COMO, CUSO, and INCO, are removed from the model because they are the indicators of MARO. The evaluation of MARO is similar to the evaluation in the first stage. The results show that the loadings of three indicators (COMO, CUSO, INCO) are all higher than the threshold value of 0.708, which establishes the indicator reliability (see Fig. 2). Besides, according to Tables 2 and 4, internal consistency reliability, convergent validity, and discriminant validity of the MARO construct are well established. Therefore, the validity of MARO constructs is sufficient.

4.2. Structural model

A bootstrapping with 5000 replacements was used to assess the structural model [144]. The collinearity issue was evaluated by assessing VIF. When this value is lower than the threshold value of 3, collinearity does not pose a concern [146]. To evaluate the model's explanatory power, R^2 was examined. This value is necessarily higher than the recommended value of 0.25 [146]. The predictive accuracy is established when Q^2 is higher than zero [146]. According to Table 5, the values of VIF, R^2, and Q^2 meet the requirements.

The next step is to evaluate the strength and magnitude of hypothesized paths. According to Fig. 2, MARO has a significantly positive relationship with INCR ($\beta = 0.219$, p = 0.009) and RADI ($\beta = 0.297$, p = 0.001). INCR ($\beta = 0.279$, p < 0.001) and RADI ($\beta = 0.229$, p = 0.005) are also significantly positively related to OP. The relationship between MARO and OP is significant ($\beta = 0.178$, p =

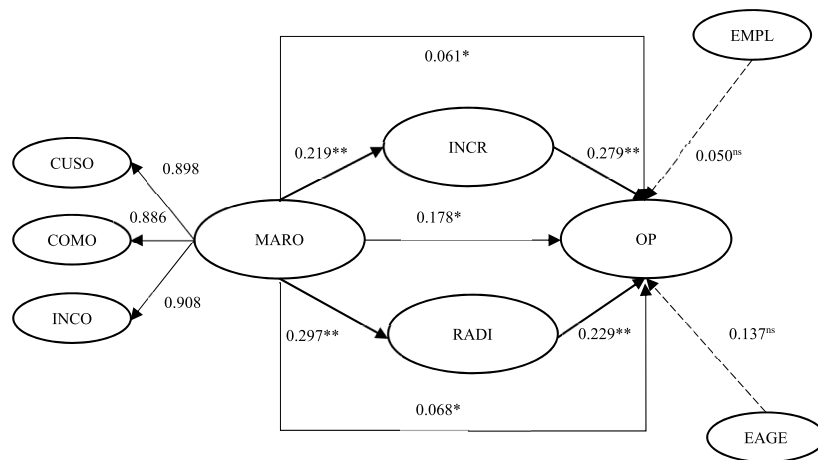**Table 2**
Cronbach's Alpha, composite reliability, and AVE.

	Cronbach's Alpha	Composite Reliability	AVE
COMO	0.856	0.903	0.699
CUSO	0.876	0.910	0.671
EAGLE	1.000	1.000	1.000
EMAIL	1.000	1.000	1.000
INFO	0.871	0.921	0.795
INCR	0.820	0.888	0.726
MARO	0.879	0.926	0.806
RADI	0.858	0.904	0.701
OP	0.920	0.934	0.641

Table 3
HTMT ratio of the correlation between the first-order constructs.

	COMO	CUSO	EAGE	EMPL	INCO	INCR	RADI	OP
COMO								
CUSCO	0.790							
EAGLE	0.057	0.075						
EMPL	0.046	0.072	0.210					
INCO	0.823	0.827	0.126	0.038				
INCR	0.215	0.220	0.068	0.056	0.231			
RADI	0.316	0.357	0.037	0.068	0.245	0.110		
OP	0.269	0.253	0.150	0.086	0.367	0.308	0.285	

Fig. 2. Results of the structural model.

Table 4
HTMT ratio of the correlation between the second-order and first-order constructs.

	EAGLE	EMAIL	INCR	MARO	RADI	OP
EAGLE						
EMAIL	0.210					
INCR	0.068	0.056				
MARO	0.081	0.038	0.248			
RADI	0.037	0.068	0.110	0.340		
OP	0.150	0.086	0.308	0.329	0.285	

Table 5
Q^2, R^2 and VIF.

	Q^2	R^2	VIF					
			EAGLE	EMAIL	INCR	MARO	RADI	OP
EAGLE								1.053
EMAIL								1.053
INCR	0.027	0.048						1.077
MARO						1.000	1.000	1.176
RADI	0.057	0.082						1.124
OP	0.127	0.197						

0.045). Thus, hypotheses H1, H2, H3, H4, and H5 are all supported.

Regarding the intervening effects of INCR and RADI, this study follows the approach of Zhao et al. [154] to examine the mediating effects in PLS-SEM analysis. This approach is based on the mediating concept firstly proposed by Baron and Kenny [155]. The results show that MARO is positively associated with INCR and RADI. Besides, both these innovations are also positively related to OP. In this regard, the independent latent variable is positively related to two mediators, and these mediators are also positively related to the latent dependent variable. These results suggest that it is safe to process further in the intervening analysis.

The results indicate that the intervening effects of INCR (β = 0.061, p = 0.033) and RADI (β = 0.068, p = 0.039) on the link between MARO and OP are significant. Besides, the range of their confidence intervals (e.g., [0.015; 0.126], [0.017; 0.146]) exclude zero. Lastly, the direct relationship between MARO and OP is significant while controlling for two types of innovation. Thus, INCR and RADI partially mediate the relationship between MARO and OP. Therefore, hypotheses H7 and H8 are supported. Table 6 summarizes this research's findings.

5. Discussion

The literature indicates that MARO has an impact on innovation and performance as well as innovation is the mediators of the relationship between MARO and performance. However, there is a lack of understanding of these relationship in the context of logistic SMEs operating in Vietnam. Thus, this study's purpose is to draw upon the resource-based view to shed lights on those relationships. These results are in line with prior empirical studies as follows.

First, the results indicate a positive relationship between MARO and OP. These findings are consistent with prior studies, which support the positive link between MARO and performance in various contexts, such as food and beverage enterprises [22], high-tech manufacturing enterprises [23], restaurants [26], and hotels [27]. These results are opposed to prior studies, which failed to establish this relationship in the contexts of beef cattle industries [24], manufacturing industries [25], banking industries [28], and property industries [29]. This study's imply that logistic SMEs gain higher OP because of MARO in Vietnam.

Second, the results indicate a positive relationship between MARO and both INCR and RADI. These results share similarities with prior studies as follows. In manufacturing contexts, Vázquez et al. [30] and Liu and Su [31] showed MARO induces innovation. In service contexts, Chou et al. [36] and Mahmoud and Hinson [37] indicated that restaurant and telecommunication enterprises adopting MARO improve innovation. These mentioned findings contradict prior authors, who indicated a non-significant relationship in manufacturing contexts [32,33], and service contexts [38]. This study's results suggest that in Vietnam, logistic SMEs improve both types of innovation, INCR and RADI when adopting MARO.

Third, the findings show a positive relationship between both INCR and RADI and OP. They are similar to prior studies, which reveal the positive association between innovation and performance in the context of manufacturing enterprises [42] and tourism enterprises [43]. This study's findings reveal that in Vietnam, both types of innovation, INCR and RADI, play a crucial role in logistic SMEs because they increase OP.

Lastly, the results demonstrate the mediating effects of both INCR and RADI on the relationship between MARO and OP. These findings support prior results on these mediating effects in the contexts of restaurant [36], banking [12,28], and telecommunication sectors [37]. This study's results show that in Vietnam, logistic SMEs find OP indirectly when adopting MARO. The MARO adoption increases both INCR and RADI and as a result, logistic SMEs gain high OP thanks to this innovative increase.

5.1. Theoretical implications

This study provides some contributions to the literature as follows. First, Wagner and Sutter [11] demanded that more research should be done to identify antecedents of innovation of logistic enterprises. Besides, Busse and Wallenburg [156] called for more research to examine the innovation-performance link in logistic contexts because according to Busse [157], this link in logistic contexts is significantly different from other service contexts. This study shows that MARO is the antecedent of two types of innovation, INCR and RADI, and both INCR and RADI improve OP in the context of logistics SMEs. In such a regard, this study extends the existing knowledge in the logistic literature.

Second, Vietnam is an emerging economy. However, it is different than other emerging countries due to being a transitional economy, transitioning from a centrally planned economy to a market-oriented economy [53]. In transitional economies, the degree of market orientation depends on economic developments [158]. It is a concern about the generalization of the positive impact of MARO on its consequences due to various degrees of economic development of studying countries [159]. Furthermore, the implementation of MARO in transitional economies are challenged by government regulation, ownership structure, and resource availability [160]. They question the impact of MARO on its consequences in Vietnam. This study shows that in the context of Vietnam, MARO has a positive impact on OP, INCR, and RADI. In this regard, this study extends the current understanding of the impact of MARO on its consequences in a transitional economy such as Vietnam.

Third, RBV provides valuable insights into how an enterprise's resources contribute to gaining a competitive advantages and achieving better performance [58]. This research aims to contribute RBV by deepening our understanding of intangible resources as

Table 6
Path coefficient and hypotheses testing.

Hypothesis	Relationship	Coefficient	t-value	Results
H$_1$	MARO -> OP	0.178	2.009	Supported
H$_2$	MARO -> INCR	0.219	2.593	Supported
H$_3$	MARO -> RADI	0.297	3.466	Supported
H$_4$	INCR -> OP	0.279	3.762	Supported
H$_5$	RADI -> OP	0.229	2.820	Supported
H$_6$	MARO -> INCR -> OP	0.061	2.073	Supported
H$_7$	MARO -> RADI -> OP	0.068	2.064	Supported

MARO. By considering INCR and RADI as competitive advantages within the RBV framework, this study recognizes the significance of innovation in creating value and improving performance. Furthermore, this research reveals the partial mediating role of INCR and RADI in the relationship between MARO and OP, offering a more detailed understanding of how MARO affects performance outcomes. Additionally, this study distinguishes between INCR and RADI, highlighting their individual contributions to performance outcomes and providing more detailed insights into the RBV framework. In summary, these findings enhance our comprehension of RBV by including MARO as an intangible resource and emphasizing the importance of two types of innovation, and as a result, they shed light on the mediating role of these innovation types between MARO and OP.

5.2. Practical implications

This finding provides managerial implications to managers of logistic SMEs in Vietnam. The adoption of MARO has a positive impact on the success of logistic SMEs. Adopting MARO permits logistic SMEs to orient to their customers and competitors. These orientations induce market intelligent through providing an insight into their customers' demands relating logistic services as well as competitors. In this regard, these SMEs can adjust their current logistic services to meet customers' needs, which results in the expansion of market shares. Additionally, an insight into competitors logistic SMEs to understand the competitors' capabilities to provide logistic services. They can gain insight into the strengths and weaknesses of logistic services provided by competitors. Thanks to this, these logistic SMEs can set up strategic plans to get ahead their competitors. Last but not least, high inter-functional coordination is a result of the adoption of MARO. It permits those intelligent to foster across the organizations, and as such, departments within a logistic SME can work together to exploit this intelligent. Therefore, logistic SMEs can perform better and gain higher than average returns thanks to the adoption of MARO.

The adoption of MARO also leads to the business success of logistic SMEs through the innovation of logistic services. In particular, market intelligent resulted from MARO allows logistic SMEs to improve innovation of logistic services through the modifications of their current logistic services as well as the introductions of new logistic services. First, the modification permits the elimination of waste in their processes and, as such, reduction of the costs of logistic services. In this regard, logistic SMEs offers lower logistic prices, which gain profits through the expansion of market shares. Second, logistic SMEs create value for their customers by the initiation of a new method of logistic services. Their logistic services are unique in the market, which permits the enhancement of reputations and customer satisfaction. Taken together, logistic SMEs take advantages of market intelligent resulted from MARO to gain business success by improving current logistic services and introducing new logistic service, which is value to customers.

6. Conclusion, limitations, and directions for future research

This study aims to examine the intervening effects of INCR and RADI on the relationship between MARO and OP in the context of logistic SMEs. Data were randomly collected from 153 logistic SMEs located in Vietnam. PLS-SEM was used to assess the research model. The results indicate that two types of innovation, INCR and RADI, partially mediate in the relationship between MARO and OP. In this regard, this study sheds light on the beneficial effects of MARO on innovation and performance in the context of logistic SMEs.

This paper is also subject to some caveats. The first limitation relates to the low response rates. The second limitation is the issues of cross-sectional data due to the collection of data at the point of time. The third limitation is the generalization of the results to other emerging countries than Vietnam because data were collected in Vietnam.

Although there are some concerns relating to the results, this study provides an avenue for future research. First, this study only focuses on how MARO leads to INCR and RADI, which results in superior OP. It was revealed that the external environment has an impact [161,162]. Thus, future research can extend this study's findings by including variables measuring the external environment into the research model. Second, the strategic pursuit is revealed to have an impact on both INCR and RADI [163]. Therefore, it is sensible to include strategic variables in the model. Third, this study focuses only on the behavioral aspect of MARO. MARO is also conceptualized as a culture that consists of reactive and proactive market-oriented culture, which has an impact on INCR and RADI in the manufacturing context. Therefore, future studies should examine whether this finding can be generalized in service contexts. Third, due to the limitation due to the cross-sectional data, future research should use longitudinal data to overcome this limitation. Lastly, one limitation of this study is the low response rate. Dillman et al. [164] provided a tailored approach to survey methods to improve response rates. Future studies should integrate this approach in the data collecting process to overcome the limitation.

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Author contribution statement

Quang-Huy Ngo: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to

influence the work reported in this paper.

Appendix

INCR	Incremental innovation
	Please indicate the degree to which you agree with the following statements
1	Our business often creates new styles for existing services.
2	Our business often improves the process for existing services
3	Our business creatively changes tools and equipment for existing services.
RADI	**Radical innovation**
	Please indicate the degree to which you agree with the following statements
1	Our business often develops new services
2	Our business is often the creator of new technologies and new processes
3	Our business often develops and introduces brand new technologies in the industry
4	Our business often introduces brand new concepts for services.
CUSCO	**Customer orientation**
	Please indicate the degree to which you agree with the following statements
1	Our objectives are driven primarily by customers' satisfaction.
2	We constantly monitor our level of commitment and orientation to customers.
3	Our strategy for competitive advantage is based on our understanding of our customer's needs.
4	Our strategies are driven by our beliefs about how we can create greater value for customers.
5	We measure customer satisfaction systematically and frequently.
6	We give close attention to after-sales service
COMO	**Competitor orientation**
	Please indicate the degree to which you agree with the following statements
1	Our salespeople regularly share information within our business concerning competitors' strategies.
2	We rapidly respond to competitive actions that threaten us.
3	We target customers where we have an opportunity for competitive advantage.
4	Top management regularly discusses competitors' strengths and strategies.
INFO	**Inter-functional coordination**
	Please indicate the degree to which you agree with the following statements
1	Our managers from every function regularly visit our current and prospective customer
2	We freely communicate information about our successful and unsuccessful customer experiences across all business function
3	All of our functions are integrated in serving target market
4	All of our managers understand how everyone in our business can contribute to creating customer value
5	We share resources with other business units.
OP	**Organizational performance**
	Please indicate your business's performance relating to following aspects
1	Return on assets
2	Sales growth
3	Profitability
4	Average productivity
5	Cost reduction
6	Customer's satisfaction
7	Customer's growth
8	Employee satisfaction
9	Quality in services
10	Organizational reputation

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