

Entrepreneurial Orientation, International Operations, and Logistics Alliance Usage: Perspective From Australian SMEs

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At a time when small-to-medium-sized enterprises (SMEs) are challenged with the international logistics disruptions, forming a large set of logistics alliance relationships has become a critical strategic matter for SMEs. The objective of this study is to examine the links between SME entrepreneurial orientation, international operations, and logistics alliance usage. Utilizing resource dependency theory and upper echelons theory, a model is tested using survey data from 222 Australian SME executives. The findings present a direct positive relationship between SME entrepreneurial orientation and logistics alliance usage. Moreover, the study finds that the link between entrepreneurial orientation and logistics alliance usage becomes stronger for the firms that participate in international operations.

Keywords: entrepreneurial orientation, international operations, logistics alliance usage

INTRODUCTION

A major lesson learned from the supply chain disruptions during the COVID-19 pandemic is to build strong strategic alliances in supply chain networks to overcome these challenges. In fact, several of the recently published research articles on building supply chain resilience point to the importance of strong, interdependent alliances among supply chain network members (Ali *et al.*, 2022; Wiedmer *et al.*, 2021; Adobor, 2019; Pettit *et al.*, 2019). When compared to larger firms, small-to-medium sized enterprises (SMEs) that are being managed by entrepreneurs have been hit harder by the recent disruptions (Bartik, *et al.*, 2021). Moreover, the pandemic also caused world-wide supply chain and logistics challenges and management of international operations become more complex. Therefore, in this study, we explore the relationship between SME managers' entrepreneurial orientation and logistics alliance usage when operating in international markets.

For SMEs, the importance of strong alliances in supply chain networks is magnified, given their need to access the necessary resources to compete against larger firms. To co-evolve as a business ecosystem and ascertain competitive advantage in the business marketplace, firms should strategically align

themselves with alliance partners that possess valuable resources (Tokman *et al.*, 2020). As a type of business ecosystem, supply chain networks characteristically advance through the successive stages of birth, expansion, leadership, and self-renewal (Moore, 1993). To achieve legitimacy as an organization, SMEs in these supply chain networks typically transition from birth to the expansion stage through the development of a prominent and reliant relationship with a single ally (Almobaireek *et al.*, 2014; Barnes *et al.*, 2007). This places SMEs in a precarious position due to the scarcity of diversity in supply chain networks and the reliance on a single alliance partner. To compensate for the lack of diversity in the second stage, SMEs progress to the third stage, the leadership stage, by shifting their attention from exceedingly reliant relationships on a single ally to a strategy where diverse alliance relationships are cultivated through alliance portfolios (Hertz, 2001).

Alliance portfolios have been previously defined as a set of mutually beneficial business partnerships for a focal firm (Hamel & Doz, 1998; Rowley *et al.*, 2000). Researchers that have studied alliance portfolio formations primarily explored the connection between business performance and alliance portfolio diversity (APD) (Jiang *et al.*, 2010; Collins & Riley, 2013). In previous studies, the conceptualization of logistics alliance diversity is wide-ranging from firm demographics to governance type and functional goals (Albers & Klaas-Wissing, 2012). Research in these streams has demonstrated that the functional alliance portfolio diversity has a positive effect on firm performance (Mouri *et al.*, 2012). Therefore, logistics alliance portfolios with increased functional diversity may contain partnerships concentrating on a variety of logistics functions such as materials purchasing, long-term production contracting, inventory management, quality control, transportation, distribution, and process innovation. While some firms may desire to construct diverse portfolios with a larger number of partners from various functional areas (Sarkar *et al.*, 2009), others may wish to include fewer partners specializing on one or few logistics functions (Faems *et al.*, 2013). Taken in aggregate, there is an insufficient amount of research relating to the antecedents of SME logistics alliance portfolio formation, particularly with focus on functional diversity versus functional specialization when configuring such portfolios.

The high failure rates of alliances (e.g., Hamel *et al.*, 1989) is a testimony to the complicated managerial processes necessary for forming logistics alliance portfolios. However, complexities in forming and maintaining supply chain relationships for SMEs have proven to be a challenge (Arend & Wisner, 2005; Croom & Watt, 2000). Much of the responsibility for forming logistics alliance portfolios falls on SME owners and/or top managers, especially since the performance of the alliance portfolios is largely decided by accurate selection of alliance partners (Gupta & Barua, 2018; Shah & Swaminathan, 2008; Zutshi & Tan, 2008). An example of this was recently discovered by Castro *et al.* (2016) who discovered that intentional and strategic participation of top executives has a direct positive effect on management of alliance portfolios. This is particularly true for SMEs where top management oversees most of the strategic decisions revolving around alliance portfolios (Abood *et al.*, 2019). One such key driver of strategic involvement is the manager's entrepreneurial orientation (EO) (Marino *et al.*, 2002). EO includes such dimensions as innovativeness, risk taking, and proactiveness (Anderson *et al.*, 2009) which may have vital importance on alliance portfolio formation decisions. Hence, drawing upon literature in entrepreneurship, supply chain management, and strategic management, the intention of this study is to explore the connection between SME top management's entrepreneurship orientation and their logistics alliance usage in international markets.

To steer the thought processes and create the model for this study, two theories from the field of strategic management are applied including resource dependency theory and upper echelons theory. Resource dependency theory proposes that firm survival, and especially the survival of SMEs, is contingent on their aptitude to obtain access to exceedingly desirable external resources (Pfeffer & Salancik, 1978). This is completed primarily by nurturing connections with alliance partners (Provan, 1984). Complementing resource dependency theory, upper echelons theory suggests that intricate portfolio decisions made by executives are inspired by their worldviews and previous experiences (Finkelstein & Hambrick, 1996; Finkelstein *et al.*, 2009; Gao *et al.*, 2022). Therefore, we investigate the moderating role of participating in international operations on the relationship between EO and logistics alliance usage,

since SME top managers' experience in international operations may influence their perceptions of entrepreneurial risk-taking and proactiveness when forming logistics alliances (Tallman, 2005).

Using an Australian sample of SMEs, a survey method was utilized to examine the relationships proposed in this study. Because SMEs add to the Australian economy at an elevated level, this sample represents a fascinating framework for this study. SMEs are defined as those firms that employ 200 employees or less, and according to Gilfillan's (2020) small business statistical report, Australian SMEs represent 88% of all firms exporting goods, 56% of total employment, 76% of jobs growth and 56% of total value added. The Australian Government acknowledges the SME segment as critical to its economy by displaying support in various ways including research grants, tax breaks, funding for apprenticeship programs, and enticements to form networks, encouraging competitiveness and innovation at a global level (Brunetto & Farr-Wharton, 2007).

Contributing to the existing literature, this study answers recent calls for integrative research relating to supply chain management, entrepreneurship, and strategic management (Ketchen & Craighead, 2020). As such, the SMEs examined in this study provide evidence for strong ties among the entrepreneurial orientation of SME top managers, participation in international operations, and logistics alliance usage. While prior research has established a positive link between entrepreneurship orientation and satisfaction with an extensiveness of alliance portfolios (Tokman *et al.*, 2013; Marino *et al.*, 2002), this study pinpointed that the entrepreneurial orientation of SME top-management is a critical factor when making decisions regarding logistics alliance usage. In this study, the first research question proposed is consistent with resource dependency theory and questions whether SME executives with high entrepreneurial orientation have an increased tendency to use a larger number of logistics alliances. Additionally, defined as the experience of SME top managers to operate in international markets, participation in international operations is an added critical strategic factor identified in this study. Also proposed in this study, the second research question is consistent with upper echelons theory and questions whether the SMEs' participation in international operations enhance the strength of the relationship between entrepreneurial orientation and logistics alliance usage rate.

First, we will examine the two proposed theories and introduce a model to explicate the links between entrepreneurial orientation, international operations, and logistics alliance usage. Then, utilizing an empirical method using hierarchical regression modeling, we will test the model, present the findings, and discuss the implications for practice and research.

THEORETICAL DEVELOPMENT

Resource Dependency Theory, Logistics Alliance Usage, and Entrepreneurial Orientation

Resource dependency theory suggests that firms are reliant on their external environment to ascertain access to important resources (Pfeffer & Salancik, 1978). It has also been argued that alliances are established to allow firms to exchange resources (Das & Teng, 2000). Consequently, SME survival is largely dependent on the proficiency of top managers to utilize relationships with alliance partners in order to achieve access to valuable resources (Dickson *et al.*, 2006). For example, SMEs may pursue logistics alliances to gain access to physical resources belonging to alliance partners such as manufacturing plants, warehouses, and vehicles for transportation (Evangelista and Morvillo, 1999). Logistics alliances may involve long-term supplier agreements, long-term distribution and transportation agreements, just-in-time agreements, export management agreements, process innovation agreements, quality management agreements, or manufacturing sub-contracting agreements (Tokman *et al.*, 2013). Each of these diverse supply chain management functions require potentially expensive physical assets that entrepreneurially managed SMEs may need in order to overcome disruptive challenges. Therefore, this study focuses on usage of logistics alliances mainly because of the SME's need for access to physical logistics resources, which would otherwise require heavy capital investments if the SMEs were to build up these physical resources on their own.

Previous studies suggest that firm's strategic orientation plays an important role regarding decisions by top management regarding alliance portfolios (Noble *et al.* 2002). One such strategic orientation is

entrepreneurial orientation (EO). EO describes “the methods, dispositions, practices, and decision-making styles managers use to act entrepreneurially” (Lumpkin & Dess, 1996, p.136) as well as how the firm directly or indirectly decides to compete when encountering developing opportunities (Wales, 2016; Rauch *et al.*, 2009). Previous research concentrating on entrepreneurial and startup firms demonstrates that organizations possessing a higher degree of EO extensively utilize strategic alliances and are likely to construct increased alliance portfolios compared to those companies with a lower degree of EO (Marino *et al.*, 2002). This study draws on resource dependence theory and investigates whether the EO of SME top managers has a significant effect specifically on the logistics alliance usage.

In a seminal piece published by Miller (1983), it was contended that “an entrepreneurial firm is one that engages in product-market innovation, undertakes somewhat risky ventures, and is the first to come up with ‘proactive’ innovations, beating competitors to the punch” (p.771). Proactiveness, innovation, and risk-taking are three characteristics central to EO (Wales *et al.*, 2011) and are frequently joined to create a higher-level indicator of firm-level entrepreneurship orientation. Proactiveness involves calculated decisions that enable companies to identify and explore opportunities such as identifying a diverse set of logistics partners and engaging in multiple logistics alliances. SMEs dedicate various types of resources in building and maintaining a diverse set of logistics alliances that could assist them in realizing competitive advantages. For example, SMEs that proactively form logistics alliances with multiple partners may gain access to diverse information sources which leads to better performance compared to those that fail to cultivate such a network (Baum *et al.*, 2000; Li *et al.*, 2011). Such proactivity has other benefits, as well. For example, Paulraj (2011) found that SMEs that proactively seek new opportunities in sustainable operations have made significant contributions in achieving higher sustainability outcomes in their logistics operations with their supply chain network members. Therefore, we posit that more proactive SMEs would be more likely to include a larger set of logistics alliances to maximize their access points for information and resource sharing initiatives to improve their logistics operations.

The EO dimension of innovativeness is conceptualized as the proclivity to participate in creativity and innovation in hopes of developing novel products or processes. Shan *et al.* (1994) determined that as the number of firm alliances increase, SMEs’ innovative output increases. Similarly, Ramachandran & Ramnarayan (1993) proposed that compared to other organizations, firms that are innovative have an increased tendency to enter an increased number of alliances. Since innovation is central to entrepreneurship (Drucker, 1993), the ability to innovate new processes may be an important source of competitive advantage for a firm’s logistics operations. For example, Rezazadeh & Nobari (2017) found that logistics alliances present opportunities to SMEs including extending access to complementary resources, unique and critical information, and the opportunity to profit from synergies. Relatedly, Kim *et al.* (2015) discovered evidence suggesting that firms displaying increased innovation compared to their peers are more inclined to focus on their operations rather than producing new knowledge. Hence, we contend that companies with a high degree of innovativeness are better situated and possess an increased tendency to include a larger ratio of logistics alliances in their strategic alliance portfolios.

Covin & Slevin (1989) found that risk-taking is a main characteristic displayed by top executives with high entrepreneurial orientation. Specifically, this dimension can be defined as the “degree to which managers are willing to make large and risky resource commitments,” (Miller & Friesen, 1978; p.923). In a business context, these failures are normally extremely expensive and worrisome. Maintaining various alliance relationships from numerous logistics functional areas (e.g. procurement, inbound logistics, quality control, inventory management, distribution and transportation, export management) increases the risks of coordination errors and relationship mismanagement. Such risks include reserved behavior in resource sharing and holding on to critical information and know-how due to competitive pressures (Cui & O’Connor, 2012; Jiang *et al.*, 2010). From a logistics alliance usage viewpoint, executives of SMEs with lower risk-taking tendencies would avoid entering in a large number of alliances to lessen the risks of coordination errors. Alternatively, SME top managers with higher risk-taking tendencies would be more willing to accept the risks posed by the intricacies of coordinating large numbers of logistics alliances. This can be explained by the fact that SME top managers that are entrepreneurially oriented can defend against coordination risks by lessening the dependence on a single or few large and influential logistics alliance

partners and expanding their access points for crucial resources to a larger set of logistics alliances. Therefore, we propose:

Hypothesis 1: *SME top management's entrepreneurial orientation has a positive impact on SMEs' logistics alliance usage.*

Upper Echelons Theory, Logistics Alliance Usage, and International Operations

The upper-echelons approach was developed by Hambrick & Mason (1984) founded on prior research that contended for the value and intricacy of strategic decisions compared to tactical ones (Mintzberg *et al.*, 1976). Additionally, prior research found that financial performance is impacted by the decisions made by top managers (Child, 1972; Finkelstein & Hambrick, 1996). Literature revolving around upper echelons theory also confirms that executives often render decisions that align with their world view (Canella *et al.*, 2008; Gao *et al.*, 2022). Supporting the impactful role that managerial cognition plays on executive decision making, the Carnegie school of decision theory proposed that executives are trained for bounded rationality, and consequently, their strategic decisions are often the result of behavioral outcomes instead of economic optimization (March & Simon, 1958). The impact of managerial cognition on overall firm governance is manifest in executives' numerous responsibilities relating to establishing the firm's strategic direction (Cyert & March, 1963; Liedtka, 2005), recognizing opportunities and challenges in the environment, interpreting important information, taking into account the company's internal position, and devising and executing strategic transformation (Mintzberg, 1979). The choice between using smaller or larger numbers of alliances is one of these intricate strategic decisions that top executives make and is based on their past experiences with alliances and their perceptions of risks and benefits involved in entering alliances.

Within the managerial cognition context, there are manifold motivations for SME top managers to pursue internationalization as a key strategy. Since organizations are reflections of the top management (Hambrick & Mason, 1984), managers may be aligning their values (Cable & Judge, 1996) for innovativeness with the organizations they currently oversee by pursuing international markets. Specifically, one would expect managers who value innovativeness to appreciate the stimulating international context for all that it has to offer firms in terms of growth opportunities, new technologies, and physical resources (Tallman, 2005) and build such practices into the DNA of their organizations. The perceived risks associated with participating in international operations varies greatly among managers and for some SME managers such pursuits may be vocationally satisfying (Tett & Meyer, 1993) and perhaps even a stimulant for developing a stronger entrepreneurial mindset (Kuratko *et al.*, 2021). These activities may also bolster top management goals to enhance learning and growth (Jaradat, 2015; Georgiades & Pitelis, 2016) within the organization, given the diverse learning curves associated with cross-border transactions. Moreover, from a functional experience perspective, the presence of SME international operations suggests that the management may have identified proactive methods to tap into less competitive markets as well as access to new customer bases (Tallman & Li, 1996; Tuan 2017). Finally, operating in international markets is riskier than limiting operations to local markets due to differences in culture, technological and logistical infrastructure adequacies, economic conditions, customers' preferences, competitive intensity, and government regulations (Srivastava & Rogers, 2022). This is particularly true from an international logistics operations perspective where the risks and complexities are bourgeoned due to factors such as port strikes, weather conditions, political instability, involvement of multiple firms in transportation and warehousing, technology integration issues, and most recently a global pandemic. Therefore, the risk-taking component of entrepreneurial orientation is critical for SMEs operating in international markets (Zhang *et al.* 2012). In sum, the EO characteristics of proactiveness, innovativeness, and risk taking all undergird international operations on the part of SME managers.

SME top managers must consider various sources of information as they deliberate on complicated matters such as boundary expansion, as they interpret external issues pertaining to the environment and rival firms, as well as appraise the skills and internal capabilities within their own organization. In order for executives to make sense of these somewhat ambiguous information sources they must filter the available data through their cognitive base (March & Simon, 1958; Hitt & Tyler, 1991). Indicated by upper echelons

theory, firms become reflections of their executive leadership over time as a result of this process (Hambrick & Mason, 1984). Due to the challenges associated with directly evaluating the cognitive bases of executives, most studies have concentrated on measuring those observable traits (e.g. functional background, tenure, and various demographic characteristics) that are expected to influence top managers' thinking (Finkelstein, Hambrick, & Cannella, 2009). Pertaining to the objectives of this study, we posit that participation in international operations provides SME executives with a broadened experience, worldview, and cognitive base to manage high-risk international environments by proactively seeking to form multiple logistics alliances that allow the SMEs to bundle their innovative resources with alliances partners' logistics resources. For instance, an innovative electronics executive in Australia who is higher on EO scale (higher on risk-taking, proactiveness, and innovativeness) would have a higher proclivity to establish a larger set of logistics alliances to transport and distribute the electronics products in international markets than a risk averse producer who chooses not to export the products. Taken in aggregate, participation in international operations interact with managerial EO and bolster the proclivity to increase logistics alliance usage.

***Hypothesis 2:** Participation in international operations moderates the relationship between SME top management's Entrepreneurial Orientation and Logistics Alliance Usage such that participating in international operations strengthens the positive relationship between SME top management's Entrepreneurial Orientation and Logistics Alliance Usage.*

METHODS

Study Sample

The Strategic Alliance Research Group dataset was utilized for the purposes of this study. This dataset included survey responses from owners and top managers of small-to-medium sized (less than 200 employees) firms from Australia using a randomized selection process. A two-wave mailing process was used to reach 1373 SMEs in Australia. The initial response rate was 25.6%. After removing the cases with multiple missing values on key variables, the remaining final sample size was 222 cases, on which the analyses were performed. Additionally, researchers conducted a follow-up with a random sample of non-respondents and found no significant differences between respondents and non-respondents. A summary of the sample firms' firmographics is provided in Table 1.

TABLE 1
SAMPLE DESCRIPTIVES

No. of Employees	Median	25%	50%	75%		
	8	3	8	22		
Annual Revenue	Median	25%	50%	75%		
	\$ 500,000	\$ 30,275	\$ 500,000	\$ 3,378,800		
Industry	Food Supplies	Industrial Supplies	Industrial Equipment	Electronics	Textile	Services
	7%	18%	18%	15%	30%	12%

Measurements

The three-dimensional measure for entrepreneurial orientation (EO) was borrowed from Covin & Slevin (1989) EO scale. Seven items from three dimensions of EO were averaged to produce a single measure (see Table-2). International Operations (INT) was measured with a single dichotomous item referring to whether or not the SME sell any products or services to customers outside Australia. To measure the SME's logistics alliance usage, respondents were asked to indicate how many of the seven different types of logistics alliances are employed by their firm. The seven listed types supply chain of alliances included: long-term supply contracting, long-term production agreements, long-term distribution

agreements, long-term transportation agreements, process innovation alliances, quality management agreements, and inventory management alliances (Tokman *et al.*, 2020). Then, the numbers of various logistics alliances utilized by firms were aggregated to form the variable named Logistics Alliance Usage.

Previous studies on alliance portfolios suggest that, when firms are constructing their alliance portfolios, various firm-specific characteristics may be critical factors (Heimericks, Klijn, & Reuer 2009; Faems, Janssens, & Neyens, 2012; Chiambaretto & Fernandez, 2016). Thus, two control variables were included in the model, namely: industry type and ownership stake by SME’s top management. We controlled for top manager’s ownership stake in the organization for two primary reasons. First, the level of power attributed to the top managers is directly related to their ownership in the firm (Finkelstein, 1992). As such, it was necessary to control for SME ownership stake to account for this potential influence and power. Second, from an agency theory perspective (Arrow, 1971; Finkelstein & D’Aveni, 1994) top managers do not always act in the best interest of the organizations that they oversee. However, as individuals who are naturally driven to optimize their utility (Thaler & Shefrin, 1981), ownership in the firm might provide an incentive to stave off agency costs associated with decisions that are not in the best interest of the organization. Overall, and important for this study, inclusion of the ownership stake variable controls for varying levels of social contracts that exist between top managers and the SME.

Measurement Validity and Reliability

A confirmatory factor analysis (CFA) was performed to measure the validity of the multi-dimensional EO variable utilizing the AMOS 28 software. All scale items loaded on their proposed variable confirming both discriminant and convergent validity (Gerbing & Anderson, 1988). One of the entrepreneurial orientation items was removed because its factor loading was below the suggested cutoff number (0.50, see Nunnally 1978) and cross-loading on another variable. Overall measurement model fit was favorable with an RMSEA of 0.058 and CFI of 0.943 (Hu & Bentler, 1999).

TABLE 2
CONFIRMATIVE FACTOR ANALYSIS – MEASUREMENT MODEL

Items	Factor Loadings	Error Term	Composite Reliability	Cronbach’s Alphas
ENTREPRENEURIAL ORIENTATION				
<i>Innovativeness</i>			0.74	0.72
EO1. Top managers favor a strong emphasis on R&D technological leadership and innovations	0.80	0.36		
EO2. Top managers favor very many lines of products and services	Eliminated			
EO3. Top managers favor dramatic changes in product and service lines	0.63	0.95		
<i>Proactiveness</i>			0.71	0.70
EO4. My company typically initiate actions to which competitors then respond	Eliminated			
EO5. My company is often the very first business to introduce new products or services, administrative techniques, operating technologies, etc.	0.68	0.69		
EO6. My company typically adopts a very competitive, “undo-the-competitors” posture	0.86	0.88		

Risk-taking			0.72	0.71
EO7. My company have a strong proclivity for high risk projects (with chances of very high returns)	0.88	0.82		
EO8. Top managers believe that owing to the nature of the environment, bold, wide-ranging acts are necessary to achieve the firm's objectives	0.81	0.93		

df = 33

$\chi^2 (p)=52.74 (0.01)$

RMSEA=0.058

CFI=0.943

IFI=0.948

In addition to the final CFA results, two reliability statistics are shown in Table 2; Composite Reliability and Cronbach's Alpha. In both cases, the reliability statistics met the 0.70 guideline suggested by Nunnally and Bernstein (1994) for proactiveness and risk-taking dimensions, thus providing internal validity for two of the three dimensions. The innovativeness dimension remained slightly below the 0.70 guideline. However, we retained this dimension in the model to retain the integrity of the Covin & Slevin scale and since its reliability statistics were above 0.60, which is acceptable according to Konting *et al.* (2009).

Moderated Regression Model and Results

A hierarchical regression analysis was conducted using the IBM SPSS 28 software to test the hypothesized relationships between EO, International Operations, and Logistics Alliance Usage. Hierarchical regression is especially appropriate for this study because it allows for the evaluation of incremental changes in R-squared as new variables are entered while controlling for the effects of other variables of interest. To capture the interaction between entrepreneurial orientation and international operations, these variables were multiplied to create an interaction variable. This interaction term, along with the main effects, were entered to the model on the final step of the regression. The results of the three-step regression analysis are reported in Table 3.

TABLE 3
HIERARCHICAL REGRESSION MODEL RESULTS

	Dependent Variable: Logistics Alliance Usage		
	Model 1: Control Variables	Model 2: Main Effects	Model 3: Moderation
Industry Type (IND)	.044	.016	.007
Ownership Stake (OS)	.192***	.122*	.775**
Entrepreneurial Orientation (EO)		.171***	.568***
Presence of International Operations (INT)		.253***	.266***
EO X INT			.788**
Model Fit:			
Adjusted R2	.029**	.116***	.132***
Change in R2		.094***	.019**

N = 222 ***p<.01 **p<.05 *p<.10

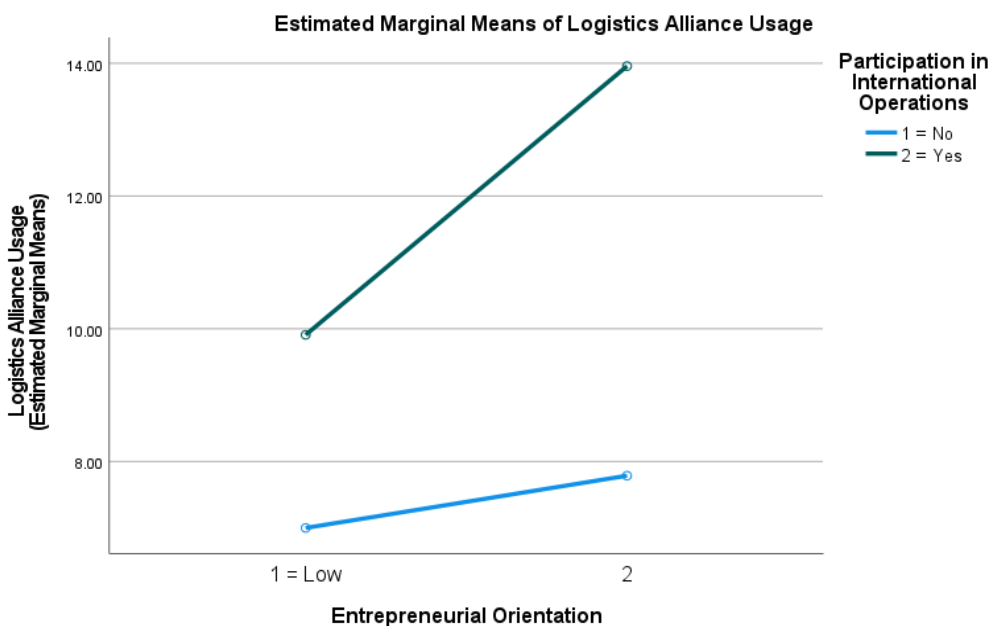
The first step included the control variables only and the model is significant ($F=4.31$, $p=0.015$) with an adjusted R^2 of 0.03. While no differences were found across the various industries, the top manager's ownership stake is found to be a significant driver of logistics alliance usage ($b=0.19$, $p<0.01$). This is an interesting finding that needs to be further explored. Perhaps, one potential explanation is that the owner SME top-managers are more likely to take risks to build collaborative advantages than non-owner SME top managers (Kanter, 1994).

In the second step, the main effects of entrepreneurial orientation and participation in international operations were introduced. The second model is also significant ($F=8.18$, $p<0.01$) with an adjusted R^2 of 0.12. The change in R^2 from Model 1 to Model 2 is also significant ($\Delta F=11.63$, $p<0.01$), implying that the main effects significantly improved the predictive ability of the model. The results of Model 2 provide support for Hypotheses 1 where the sign of the relationship between entrepreneurial orientation and logistics alliance usage is positive and significant ($b=0.17$, $p<0.01$).

In the third and final step, the full model with interaction variable was tested. Once again, the full model is significant ($F=7.62$, $p<0.01$) with an adjusted R^2 of 0.13. Moreover, Model 3 demonstrates a significant improvement over the first two models as measured by the change in R^2 ($\Delta F=4.82$, $p=0.029$). Two-way interaction terms are calculated by multiplying the mean-centered variables to avoid collinearity (Jaccard, Turrisi, and Choi 1990). The results of model 3 provide support for Hypothesis 2. Hypothesis 2 suggests that in the presence of international operations the positive relationship between entrepreneurial orientation and logistics alliance usage becomes stronger. The interaction term (entrepreneurial orientation x logistics alliance usage) is significant in the expected direction ($b=0.79$, $p=0.029$) implying that participation in international operations is a moderator of the relationship between entrepreneurial orientation and logistics alliance usage. Hence, Hypothesis 2 is supported.

For better understanding, the interaction effects are plotted to demonstrate the cell means for the dependent variable – Logistics Alliance Usage - as shown in Figure 1. To form the cells, we identified the median as the cutoff point for Entrepreneurial Orientation and recoded the subjects as high (2) and low (1) (Cohen & Cohen, 1983). Figure 1 indicates that participating in international operations strengthens the positive relationship between SME top management's Entrepreneurial Orientation and Logistics Alliance Usage.

**FIGURE 1
INTERACTION PLOT**



DISCUSSION

Connecting variables and theoretical perspectives from entrepreneurship, strategic management, and supply chain management, this study investigated the links between Australian SMEs' entrepreneurial orientation (EO), international operations, and logistics alliance usage. The findings suggest that SME EO has a positive effect on logistics alliance usage. Moreover, the relationship between EO and logistics alliance usage become stronger for the SMEs that operate in international markets compared to those only operate in local markets.

Implications for Theory

This study incorporates two theories from the field of strategic management to build the linkages between EO, international operations, and logistics alliance usage. Resource dependency theory contends that firm survival is contingent on the ability of top management to obtain access to exceedingly desirable resources from the external environment (Pfeffer & Salancik, 1978). Typically, SMEs gain valuable resources through resource exchanges with alliance partners (Dickson *et al.*, 2006). Upper echelons theory contributes to resource dependency theory arguments by proposing that the previous experiences and world views of SME top executives influences the decisions they make regarding the size and configuration of alliance portfolios (Hambrick & Mason, 1984).

Previous studies have found that adoption of specific strategic orientations by firms influences the various ways alliance portfolios are built (Day & Wensley 1983; Noble, Sinha, & Kumar 2002). More specifically, two studies found that entrepreneurial orientation influenced strategic alliance portfolio related outcome variables. For example, Marino, *et al.* (2002) discovered that companies with an increased degree of EO build alliances with higher resource linkages and utilize strategic alliances more extensively. Additionally, Tokman, *et al.* (2013) suggests that higher levels of EO leads to higher levels of satisfaction with alliance portfolio relationships. This study investigated the relationship between small business top-managers' entrepreneurial orientation and their logistics alliance usage on the principals of resource dependency theory. The analyses showed that the SME executives pursue a larger number of logistics alliance partners that provide access to highly valuable logistics resources when their entrepreneurial orientation was higher. This finding could be explicated by the idea that SME executives with increased EO inherently function in environments that are exceedingly innovative where they seek to develop logistics alliances to gain access to their alliance partners' valuable logistics resources (e.g., warehouses and manufacturing plants) and to have the ability to establish a distribution network for the SME's innovative products. This notion incorporates all three dimensions of entrepreneurial orientation: i) innovativeness by innovating new processes to escalate efficiency of logistics operations; ii) risk-taking by increasing reliance on external resources from multiple logistics alliance partners, and iii) pro-activeness by finding logistics alliance partners to exchange SME's innovation resources with external logistics resources. Therefore, the findings suggest that EO is an important determining factor for the logistics alliance usage for SMEs. Researchers studying logistics alliance portfolios and networks can utilize the results of this study to investigate various other strategic orientations of a firm as possible influencers of alliance portfolio formation decisions by utilizing the resource dependency theory.

From the perspective of upper echelons theory, Gulati (1999) proposes that the inclination of a firm to form alliances can be attributed to SME executives' past experiences and worldviews. SME executives, who had challenging operational experiences in high-risk international environments, would more proactively evaluate the environment for novel logistics alliance opportunities to combine their innovative resources with the alliance partners' logistics resources. In fact, Ahmed *et al.* (2019) found that EO (especially risk taking and proactiveness) broadens an SME's internationalization efforts. The results suggest that SME executives view participation in international operations as an environmental condition that strengthens the link between EO and logistics alliance usage. Researchers studying logistics alliance portfolios and networks can utilize the results of this study to investigate numerous other characteristics, experiences, or worldviews of small business executives as possible driving factors of logistics alliance portfolio formation decisions by applying the upper echelons theory.

Implications for Practice

Previous research found a positive link between higher degrees of EO and more extensive strategic alliance usage (Marino *et al.*, 2002). Similarly, Tokman *et al.* (2007) found that Greek SMEs proactively seek to form alliance portfolios that cultivate internal resources for the purpose of process innovation under highly unstable environmental conditions. This study suggests similar findings proposing a positive link between EO and logistics alliance usage. SME executives with increased EO may seek to investigate their alliance partners' logistics resources due to the increased need for expensive physical resources such as warehouses, supply chain technologies to control inventory, and truck fleets. By forming these types of logistics alliances, SME executives with increased EO can eliminate the requirement of larger capital investments by combining their innovativeness with the logistical and operational resources of their logistics alliance partners. Alternatively, top managers of SMEs who are low on EO utilize a defensive strategy to survive by developing a proficiency in quality control systems and efficient production. These study results were further supported with a post-hoc analysis performed to investigate the relationship between EO and SMEs' industry. The results of the post-hoc analysis suggest that SMEs with increased EO were largely members of industries that are more innovative such as computer manufacturing and electronics, whereas SMEs with low EO displayed membership in steady industries like production of wood, lumber, plastics, and rubber. Thus, the findings suggest that small business executives with higher EO function in innovative environments and look for the opportunities to exchange for the alliance partners' valuable supply chain and distribution-based resources.

The results of this study also suggest that SMEs' involvement in international operations has a moderating effect on the link between EO and logistics alliance usage. When the SMEs participate in international operations, the positive relationship between EO and logistics alliance usage becomes stronger. For SME managers, participation in international operations presents a higher risk environment where alliances are seen as a necessity for survival. More specifically, the logistics alliances provide the SME managers with the sought-after logistics resources that are necessary for the sourcing, manufacturing, and distribution of SMEs innovative solutions in international markets. Therefore, it is essential for SME managers to develop a worldview that is positive towards alliance usage in international markets. To verify this, a post-hoc analysis was performed to examine the relationship between participation in international operations and SME executive satisfaction with the performance of previous alliance relationships. The results suggest a significant relationship between participation in international operations and satisfaction with the performance of previous alliance relationships ($R = .172$, $p = 0.041$). This result supported the claim that SME executives that operate internationally have a positive view of alliances formed with supply chain network members when they participate in international operations and such positivity towards alliances adds to the strength of the relationship between EO and logistics alliance usage.

LIMITATIONS AND FUTURE RESEARCH

The use of perceptual data, a cross-sectional design, and the inability to generalize results beyond Australian firms are limitations to this study. Perceptual data on entrepreneurial orientation measures may be impacted by environmental and individual variances across SME executives. Furthermore, the cross-sectional design is a limitation as it may be more beneficial to explore longitudinal configuration of logistics alliance usage to study the evolutionary process rather than collecting data at a specific point in time. The entrepreneurial orientations of SME top managers may be connected to their most current experiences with logistics alliance partners. Thus, we may not observe the full picture using cross-sectional data. Finally, this study's findings need to be tempered due to the single-country sample of Australian SMEs. With no comparison using similar data from additional countries, we are not able to eliminate the limitation of generalizability. Nonetheless, the number of SMEs and the context are fascinating, adequate, and offer generalizable findings across several industries. Collecting data from additional countries may alter the findings to a certain degree, but we do not expect the results to diverge in a significantly different direction.

This study investigated a moderated relationship between SME entrepreneurial orientation, participation in international operations and logistics alliance usage. Forthcoming research may also

investigate the EO-logistics alliances relationship and explore additional moderators of this relationship including other types of managerial attitudes, experiences, or worldviews. For instance, we found that EO top-managers' ownership stake has a positive and significant impact on Logistics Alliance Usage when added to the model as a control variable. One may argue that holding an ownership stake as a top-manager may vary the attitudes and worldviews of SME top-managers and therefore should be tested as a moderator as well. Furthermore, forthcoming research exploring logistics alliance portfolio formations may also examine: (i) additional kinds of strategic orientations that lead to higher rates of logistics alliance usage, and (ii) whether using a larger set of logistics alliances is part of a proactively planned strategic choice or simply a reaction to market dynamics.

To examine the link between entrepreneurial orientation and logistics alliance usage, upcoming research may expand the methodology to include dyadic data gathering from SMEs and logistics alliance portfolio members. An additional rich avenue of research might include investigating how managers change their supply chain portfolio formations based on increased experience in their entrepreneurial orientation. The findings of our study are not only meant to present a model to explain the relationship between SME top manager entrepreneurial orientation and logistics alliance usage, but also to motivate others further build on the theoretical foundations related to research at the intersection of supply chain management, entrepreneurship, and strategic management (Ketchen & Craighead, 2020).

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