

THE NETWORK MODEL OF INTERNATIONALISATION AND EXPERIENTIAL KNOWLEDGE⁸⁶

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ABSTRACT

This study operationalized the network model of internationalisation (Johanson and Mattsson, 1988) to test the association between experiential knowledge, degree of internationalisation and network degree of internationalisation. Using Eriksson et al.'s three knowledge constructs (1997), the ANOVA results confirm the predicted sliding scale of experiential knowledge levels for International among Others firms. The results also confirm the higher foreign business knowledge levels of the Late Starter relative to the Lonely International due to the advantage of residing in a highly internationalised network.

INTRODUCTION

Previous research has generally treated firm knowledge as an implicit explanation of the internationalisation process (Leonidou and Katsikeas, 1996), even though it was highlighted as an important explanatory construct in the process model of internationalisation (Johanson and Vahlne, 1977; 1990). Furthermore, international decision making traditionally has been characterised as unilateral, although the second iteration of the process model of internationalisation acknowledged the need to take account of multilateral decision making influences (Johanson and Vahlne, 1990). In this paper, we refocus on firm knowledge to explain the internationalisation of the firm while extending this to take account of the knowledge residing in the firm's network of contacts.

Generally speaking, the experience gained from the foreign marketplace can translate into knowledge that can be used to resolve problems or select alternative options relating to international operations (Brockman and Anthony, 1998). However, the problem with this perspective is, how can a firm that has no international operations acquire relevant knowledge? This is where the international experiences and contacts of network members can be invaluable, if the inexperienced firm can learn from the lessons of others (Bonaccorsi, 1992). This is an important qualifier since, in order to transfer knowledge between entities, experiential knowledge is transformed into objective knowledge (Nonaka, 1994), however, it is contested that experiential knowledge is more important than objective knowledge in terms of informing the firm's decision making (Johanson and Vahlne, 1977; 1990). Thus, we set out to explore the relationship between the degree of internationalisation of the firm and the level of experiential knowledge residing with the firm and its network.

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The following section both enlarges on the literature informing the research and presents the resulting hypotheses. The method and measures employed in the study are highlighted before discussing the results of the MANOVA tests. Finally, the implications arising from both the findings and the approach comprise the conclusion to this paper.

LITERATURE REVIEW

This section firstly reviews the extant literature on experiential knowledge and internationalisation in relation to the degree of internationalisation of the firm and its network. Two models inform these perspectives, namely the process model of internationalisation (Johanson and Vahlne, 1977; 1990) and the network model of internationalisation (Johanson and Mattsson, 1988). This is further explored in terms of the three experiential knowledge constructs identified by Eriksson et al. (1997), namely internationalisation knowledge, foreign business knowledge and foreign institutional knowledge. Then, in order to aid theory development, the four typologies identified by Johanson and Mattsson (1988) become the focus of the review in relation to the predicted levels of the three experiential knowledge components.

Experiential Knowledge and the Degree of Internationalisation of the Firm (the Process Model of Internationalisation)

Based on the work of Johanson and Vahlne (1977; 1990), the process model highlights how both objective and experiential knowledge influence the degree of internationalisation of the firm. While objective knowledge, pertaining to such issues as market methods, statistical tools and the such, can be generalised across markets, experiential knowledge is much more endemic and is concerned with issues such as culture, distributive structures and customer characteristics (Badaracco, 1991; Nonaka, 1994; Inkpen, 1996).

According to the model, it is experiential knowledge that reduces the firm's perception of market uncertainty or risk, which, in turn, impacts on commitment to international markets. Experiential knowledge is considered to be more valuable than objective knowledge in such circumstances (Johanson and Vahlne, 1977) since it allows for "... direct knowing, immediate understanding, learning without conscious use of reasoning, or making a choice without formal analysis" (Brockmann and Anthony, 1998: 455). It is the need to acquire experiential knowledge that leads the firm to taking small, incremental steps to opening up new markets (Johanson and Vahlne, 1977).

Therefore, we contend that the degree of internationalization of the firm, which is one dimension of the Johanson and Mattsson (1988) network model, is directly associated with the level of experiential knowledge residing in the firm. The next subsection considers the second dimension of the network model, namely the degree of internationalization of the network.

Experiential Knowledge and the Degree of Internationalization of the Network (the Network Model of Internationalization)

According to Holm et al. (1996: 1049) "While most research on foreign market entry has focused on entry mode selection, our findings indicate that the development of cooperative relationships with customers, suppliers or other business partners may be critical." The network model of internationalisation (Johanson and Mattsson, 1988) allows for the influence of external actors or organisations on the internationalisation of the firm. Comprising two

dimensions, the degree of internationalisation of the firm and the degree of internationalisation of the market, the network model enlarges on the process model by allowing for multilateral influences on the international decision making of the firm (Johanson and Mattsson, 1988; Johanson and Vahlne, 1990).

Despite a strong theoretical relationship with the process model, experiential knowledge is not an explicit component of the network model of internationalisation. This is, perhaps, not surprising when one takes into account the original arguments of Johanson and Vahlne regarding experiential knowledge under the process model (1977). That is, the focus of the model is on the experience of the firm in the international market rather than the experience of the individual or external actors, and that the current activities of the firm are its main source of experience. Although the firm may be able to recruit people, or talk with external actors, who have experience in the target markets, until these individuals/external actors are able to generate experiential knowledge of the firm they will not have a significant impact on the firm's internationalisation efforts. Essentially, market and firm experience are both required. The delay in generating experiential knowledge, either at the firm to market level or the experienced individual/external actor to firm level, will mean that internationalisation progresses slowly (Johanson and Vahlne, 1977).

Nevertheless, Welch and Welch (1996: 12) make a compelling argument for relaxing Johanson and Vahlne's original assumptions; "The development and utilization of foreign networks is ... closely related to the learning process that underlies overall internationalization. Indeed, an important part of a company's knowledge is often created and maintained through actors in its relevant networks." Essentially, by being exposed to a greater number and variety of knowledge sources than if the firm relied solely on its internal capabilities, a firm's network offers numerous opportunities for vicarious learning (Osland and Yaprak, 1995; Inkpen, 1996). A number of empirical studies have demonstrated that a firm is able to acquire relevant international knowledge from its network (Holm et al., 1996; Chetty and Eriksson, 1998). However, whether this knowledge translates directly to learning, or experience in Johanson and Vahlne's terms, is still debatable.

Regardless, Bonaccorsi (1992) points out that, even without the direct channels of communication of a network, a firm may feel comfortable imitating other firms' internationalisation decisions. Similarly, Fiegenbaum et al. (1996) contend that decision makers use 'reference points' to assist their deliberations, especially where there is a high element of risk, and this results in a 'bandwagon effect' in strategic outcomes. While such behaviour does not constitute a direct transfer of knowledge across organisations or actors, imitation increases experiential knowledge simply by having to confront the consequences of the copycat decision (Bonaccorsi, 1992).

Thus, it is the contention of this paper that the network represents a source of knowledge, either directly or indirectly, which can be capitalised upon in terms of the internationalisation of the firm.

Experiential Knowledge Constructs

There has been little empirical work on international experiential knowledge at both the level of the firm and the network, perhaps due to the difficulty of operationalising the constructs of the process and network models. The empirical studies that have been conducted on Johanson and Vahlne's process model (1977) have tended to focus on the more testable manifestation of the model, namely the establishment chain derived from Johanson and

Wiedersheim-Paul's 1975 work (see, for example, Coviello and Munro, 1997; Sullivan and Bauerschmidt, 1990/1). The qualitative studies on the Johanson and Mattsson's network model (1988) have focused on the key strategic decisions of international market selection and choice of entry mode (Andersen, 1997). The relationship between levels of knowledge and internationalisation tends to be an implicit dimension in many of the operational studies of both the process and network models.

A notable exception is the study by Eriksson et al. (1997) who operationalised knowledge at a firm and market level. The authors developed three constructs to measure international experiential knowledge. Market knowledge is broken down into two aspects; foreign business knowledge and foreign institutional knowledge. The foreign business knowledge component seeks to capture experiential knowledge pertaining to clients, competitors and the market. On the other hand, foreign institution knowledge is concerned with knowledge of government, culture, and institutional frameworks and norms. These two types of knowledge allow a firm to become aware of opportunities and problems in the foreign market. The third knowledge construct is termed internationalisation knowledge. Whereas foreign business and foreign institutional knowledge pertain to the 'know-why' aspect of experiential knowledge, it is asserted that internationalisation knowledge captures the 'know-how' or procedural element of experiential knowledge. Internationalisation knowledge is related to the firm's requirement for experiential knowledge that will facilitate its international operations, for example, adapting resources and capabilities to the international environment. The procedural role of internationalisation knowledge was supported by Eriksson et al.'s empirical tests (1997). They found that the internationalisation knowledge construct had a strong causal relationship with foreign business and foreign institutional knowledge. That is, firm-specific knowledge permits the firm to understand what knowledge it requires regardless of the market.

The knowledge constructs developed by Eriksson et al. (1977) were refined for this study and became our dependent variables (see Methodology Section). The independent variables, namely the level of internationalisation of the firm and its network, were derived from operationalising the two dimensions comprising the network model of internationalisation (Johanson and Mattsson, 1988) (see Methodology Section). Meanwhile, the following section develops hypotheses concerning the relationships between the dependent and independent variables in the context of the 4 firm typology developed by Johanson and Mattsson, 1988).

THEORY DEVELOPMENT

The network model draws attention to a firm's changing internationalisation situation as a result of its position in a network of firms and associated relationships. Johanson and Mattsson (1988) contend that a highly internationalised firm is positioned within a foreign network and, thus, enjoys direct relationships with foreign actors. Having a network orientation and, consequently, identifying the roles and strengths of the actors within it provides the firm with an understanding of possible constraints and opportunities for its operations (Axelsson and Johanson, 1992; Johanson and Vahlne, 1992). Furthermore, being positioned within a foreign network allows the internationalised firm to develop relationships that, in turn, can lead to further linkages with other actors (Axelsson and Johanson, 1992; Johanson and Vahlne, 1992). Case study research has shown that the development and termination of network relationships can explain the internationalisation patterns of many firms, especially with regard to market selection and entry mode (Axelsson and Johanson, 1992; Johanson and Vahlne, 1992; Coviello and Munro, 1997).

Johanson and Mattsson (1988) use the network framework to suggest an internationalisation typology. They describe how the degree of internationalisation at both micro and macro levels can be conceptualised as four broad firm level international situations; namely, the Early Starter, the Late Starter, the Lonely International and the International among Others. These typologies form the basis of our theory development efforts.

The Early Starter

The Early Starter firm possesses a low degree of internationalisation, with its network sharing this characteristic (Johanson and Mattsson, 1988). The process model describes how the firm's internationalisation situation can influence its level of experiential knowledge in two ways. First, the extent to which a firm is committed to a market, that is, the scale and scope of its operations, can affect the level of information feedback from the foreign market (Johanson and Vahlne, 1977; 1990). In other words, the greater the commitment to the market, the stronger the information channels (Johanson and Weidersheim-Paul, 1975). The firm level internationalisation status of the Early Starter suggests that it possesses only weak channels with foreign networks. Second, the process model contends that knowledge can be acquired through the firm increasing its interaction with the market or, in other words, intensifying its current activities (Johanson and Vahlne, 1977; 1990). Not only can the firm increase its knowledge levels through the process of 'learning by doing', but Johanson and Mattsson (1988) also remind us that an underlying tenet of industrial network theory is that the knowledge of other actors in the network can influence a firm's decision-making (Axelsson and Johanson, 1992; McKiernan, 1992). Consequently, the relationships that the international firm has with its network are considered important for the accumulation of knowledge. The Early Starter's lack of current activities involving foreign actors, directly or indirectly, hinders the acquisition of knowledge. In addition, the lowly internationalised position of the network further limits the available knowledge resources. Overall, with the Early Starter firm having little or no experience of operating in a foreign market and possessing few and relatively weak relationships with international firms, knowledge feedback direct from the foreign market to the firm is limited

Eriksson et al. (1997: 345) remind us that “[i]t can be expected that the less experience a firm has of international business, the less knowledge it will have to organise international operations.” That is, internationalisation knowledge permits the firm to understand what foreign business knowledge and foreign institutional knowledge it requires. Therefore, it is expected that the Early Starter's lack of international exposure would be reflected by a low level of internationalisation knowledge, which in turn is expected to translate into low levels of foreign business and foreign institutional knowledge. Thus, we can hypothesise that:

H1: the Early Starter will exhibit low levels of internationalisation knowledge, foreign institutional knowledge and foreign business knowledge relative to the other 3 firm types.

The Late Starter

Like the Early Starter, the Late Starter has a low degree of internationalisation, but is positioned in a highly internationalised market. Consequently, the Late Starter is characterised by a low level of commitment and activity in international markets, low levels of international experience and few direct international relationships (Johanson and Mattsson, 1995). However, it is argued that the Late Starter will enjoy a knowledge advantage relative to the Early Starter.

Supporting this, industrial network theory contends that the knowledge of other actors in the network can influence a firm's decision-making (Johanson and Mattsson, 1988; Axelsson and Johanson, 1992; McKiernan, 1992). Bonaccorsi (1992) maintains that, especially for small firms, decisions related to committing resources to the internationalisation process are generally made on the basis of the collective experience of the firm's business network. These communication networks are important in the gathering of knowledge from the markets and are often shared through a strong interpersonal network (Denis and Depelteau 1985; Welch and Luostarinen, 1988; Bonaccorsi, 1992). Bonaccorsi (1992) also points out that, even without direct channels of inter-firm communication, firms may feel comfortable imitating other firms' internationalisation decisions. For example, a member of the network may decide to increase its commitment to its international operations. Upon observing these actions, other firms in the network may imitate the initiating firm. While this might not constitute a direct transfer of knowledge between actors, Bonaccorsi (1992) adds that imitation may improve experiential knowledge levels because the firm becomes more familiar with the foreign market through imitating others. However, support for this proposition is mixed, with a study of Finnish small- and medium-sized firms providing evidence contrary to the bandwagon effect (Holmlund and Kock, 1998). Nevertheless, numerous empirical studies offer support for the assertion that the firm acquires knowledge from the wider network (Holm et al., 1996; Chetty and Eriksson, 1998).

The Late Starter also stands to further enhance its overall experiential knowledge levels through participation in its highly internationalised network. Notwithstanding the observation that the Late Starter only has indirect contact with international networks, cultivating these relationships is still contended to furnish the firm with valuable experience regarding the ability to develop and co-ordinate a position within a foreign market. Consequently, this should have a positive influence on its foreign business knowledge and foreign institutional knowledge levels.

Therefore, a highly internationalised macro position should provide an inexperienced firm with greater experiential knowledge levels, relative to an inexperienced firm in an internationally inexperienced network. In other words, the level of experiential knowledge residing in the firm's network should have a positive influence on the firm's own level of experiential knowledge. This is perhaps why the Late Starter is often described as internationalising at a faster rate compared to the more incremental process of the Early Starter (Oviatt and McDougall, 1994), the contention of which is outside the scope of this research. Therefore, we hypothesise that:

H2: the Late Starter will exhibit higher levels of internationalisation knowledge, foreign institutional knowledge and foreign business knowledge relative to the Early Starter (due to the advantage of residing in a highly internationalised network).

The Lonely International

Although the Lonely International firm resides in an internationally inexperienced network, its greater degree of commitment to the internationalisation process, as reflected by its relatively high degree of internationalisation, is contended to provide with the firm with greater levels of experiential knowledge relative to the Early Starter and Late Starter.

Although it is suggested that the Late Starter could benefit from the knowledge of its more experienced peers, it is contested that this advantage is not considered enough to offset the experience of the Lonely International. This is attributed to the Lonely International's

acquisition of knowledge from first hand experience. The reasoning behind this involves the argument that experiential knowledge is only useful once it becomes firm specific, with first hand experience allowing the firm to more ably blend the new experiences with its existing knowledge base and organisational procedures (Johanson and Vahlne, 1977). Thus, the direct or exchange specific relationship of the Lonely International firm with its foreign market will allow for a greater level of internationalisation knowledge to be tailored to the firm's requirements when compared with the indirect channels of the Late Starter (Johanson and Vahlne, 1992). Although, some involvement with its network is asserted to furnish the Late Starter firm with some understanding of the international environment, it is contended that the level of internationalisation knowledge required to manage and co-ordinate an increase in the level of operations and relationships has not yet been accumulated. Therefore, the greater level of internationalisation knowledge should also contribute to the Lonely International possessing an advantage in foreign institutional knowledge in relation to the Late Starter:

H3a: the Lonely International will exhibit higher levels of internationalisation knowledge and foreign institutional knowledge relative to the Late Starter (due to the advantage of being a more highly internationalised firm).

However, it is argued that the less internationalised macro-position of the Lonely International negates its advantage with regard to its foreign business knowledge levels relative to the Late Starter. Given that foreign business knowledge is concerned with the understanding of, *inter alia*, other firms comprising the international network (Eriksson et al., 1997), it is expected to reflect the influence of the firm's network. Furthermore, it is surmised that the usefulness of the knowledge resources present in the network is dependent on the experiences of its members because, as expounded earlier, experiential knowledge is gained from a process of 'learning by doing' (Johanson and Vahlne, 1977). Therefore, it is postulated that a highly internationalised network would be a greater source of experiential knowledge for an internationalising firm, relative to the knowledge resources present in a network characterised by lowly internationalised actors. Consequently, this would expose firms to a greater number and variety of knowledge sources than they might expect if they relied solely on their internal capabilities for learning (Osland and Yaprak, 1995; Inkpen, 1996). While the Late Starter might have only indirect relationships with the international marketplace, Granovetter (1982) conjectures that weaker ties are useful for increasing the firm's awareness of its business environment. This is attributed to the ability to maintain weaker connections to different clusters of strongly associated firms, whereby the firm can keep abreast of a range of developments that may result in opportunities for business (Granovetter, 1982). Therefore, we hypothesise that:

H3b: the Lonely International will exhibit a lower level of foreign business knowledge relative to the Late Starter (due to the disadvantage of not residing in a highly internationalised network).

The International among Others

Johanson and Mattsson (1988) describe the International among Others firm as enjoying a high degree of internationalisation. Like the Lonely International, the International among Others has established and developed positions and resources in foreign markets. However, the International among Others also has a highly internationalised macro-position, which is argued to provide it with higher levels of experiential knowledge when compared with the Lonely International. This, in part, stems from the assertion that "... the diversity of

environments in which a firm operates may be a 'key asset of the multinational firm' since it provides the firm with a superior knowledge base" (Ghoshal, 1987: 431, as cited in Madhok, 1997: 42). This superior knowledge base arises not only from the firm acquiring skills that pertain to a particular country (Porter, 1990), but also from the greater interdependency of an internationalised network. Consequently, the highly internationalised macro-position of the International among Others firm might transpire to provide it with greater experience in integrating and co-ordinating its network positions (Johanson and Mattsson, 1988), thus, improving its level of internationalisation knowledge. In addition, the need to co-ordinate and integrate market positions in a highly internationalised environment is argued to hasten the firm's need to learn in order to sustain and improve its network positions (Lei, 1993; Osland and Yaprak, 1995; Bartlett and Ghoshal, 1991), again encouraging the development of internationalisation knowledge and, by implication, its foreign business and foreign institutional knowledge (Eriksson et al., 1997). Therefore, we can hypothesise that:

H4: the International among Others will exhibit high levels of foreign institutional knowledge, internationalisation knowledge and foreign business knowledge relative to the other 3 firm types.

In sum, it is hypothesised that a sliding scale of experiential knowledge levels will exist amongst the four firm typology of Johanson and Mattsson (1988) based on the following three arguments. One, acknowledging Johanson and Vahlne's position that international knowledge is only valuable when absorbed, or experienced, at the level of the firm (1977), subtle differences should be observable in knowledge levels based on the firm's degree of internationalisation. Two, the experiential knowledge residing in the firm's international network is expected to combine with the experiential knowledge of the firm to create an added knowledge advantage, either directly, through network interactions, or indirectly, through imitation (Bonaccorsi, 1992). Three, of the three knowledge constructs, foreign business knowledge is expected to reflect the strongest influence of the firm's network given that it is concerned with the understanding of, *inter alia*, other firms comprising the international network (Eriksson et al., 1997).

METHODOLOGY

As a starting point, the two dimensions of the network model, the degree of internationalisation of the firm and the degree of internationalisation of the market, were operationalised. The degree of internationalisation of the firm comprised a number of measures that served as the input to a clustering solution to distinguish highly internationalised versus lowly internationalised firms. This approach was employed because there appears to be no widely accepted method for determining the degree of internationalisation of a firm (Sullivan, 1994; Ramaswamy et al., 1996). Using a single criterion, such as foreign sales relative to total sales or the number of markets served, has traditionally been a common means of undertaking this task. Yet, using such simple constructs to measure a phenomenon as complex as the internationalisation process fails to provide much insight in terms of a firm's ability to operate in the international marketplace (Cavusgil, 1984; Turnbull, 1987; Welch and Luostarinen, 1988; Sullivan, 1994). In other words, it can misrepresent the construct and, consequently, risk distorting the validity of the results (Sullivan, 1994). As Sullivan (1994) points out, the arbitrary use of measures may be the underlying reason for the contradictory findings regarding the development of the internationalisation process. Consequently, numerous researchers (for example, Reid, 1981; Welch and Luostarinen, 1988; Dalli, 1994; Sullivan, 1994) assert that, in order to increase the

understanding of the internationalisation process, a multidimensional framework or composite measure is required to determine a particular firm's state of internationalisation. This study employed three broad internationalisation measures, following Sullivan (1994), concerned with performance, structure and attitude. However, due to some of the shortcomings of generating composite measures of internationalisation (for example, see Ramaswamy et al., 1996) the study employed the cluster analysis technique to allocate the respondents to two groups: highly internationalised and lowly internationalised.

Secondary industry-based data were employed to measure the degree of internationalisation of the network. The ratio of exported goods to total amount produced served as a proxy variable, with a 10 per cent threshold distinguishing between lowly internationalised and highly internationalised networks (Turnbull, 1987). When combined, the firm level and industry level data permitted the identification of the four categories of international firms in accordance with Johanson and Mattsson's 1988 typology.

Although there are methodological difficulties in measuring knowledge, Holtshouse (1998) proposes examining the effect that knowledge can have on an organisation and its activities. This is the avenue that Eriksson et al. (1997) pursued when operationalising their constructs during their investigation of the impact of experiential knowledge on the cost of the internationalisation process, with respondents asked if a lack of knowledge would hinder a possible expansion in their international operations. As discussed earlier, Eriksson et al. (1997) developed three constructs to measure international experiential knowledge, and our experiential knowledge measures were derived from these and were measured on 7-point Likert scales, with a summated scale used to consolidate the items.

The postal survey and fax survey follow-up generated 79 observations from five industries within the Australian and New Zealand secondary industry sectors; electronics, food and beverages, printing and publishing, non-metallics and furniture. This represented a total response rate of 16% that, although low by international standards, is not low by New Zealand and Australian standards. No significant country or industry effects were detected. Assuming the responses from the follow-up fax sample were representative of non-respondents (as per Datta, 1991; Eriksson et al., 1997), tests indicated that non-response bias was not a problem. Additionally, it was considered appropriate to aggregate the responses from the mail and fax surveys.

In addition to the above noted control variables, the questionnaire also sought information to account for the possible influence of organisational resources on the firm's degree of internationalisation: firm age, size and international experience. The average age for the sample was 33, while the mean size was 137 employees. However, the median for the latter measure is 34 employees, thus, suggesting that at least half the sample can be categorised as small- to medium-sized businesses. With 14 years being the average number of years since respondents first ventured into the international marketplace, the sample appears, at least on face value, to enjoy a reasonable level of experience. The study also controlled for ownership. According to Buckley and Casson (1979), subsidiaries can often benefit from a 'branch effect', whereby the parent's knowledge is utilised by the subsidiary in competing against host-country firms. Parent organisations constituted 81% of the sample.

RESULTS

Organisational size was the only control variable found to differ amongst the four categories of internationalisation and, thus, is included in subsequent analyses. Firms were divided along the median number of employees; those firms with 34 employees or less were categorised as smaller firms and the remaining firms classified as larger firms. The MANOVA results are summarised in Figure 1 in terms of the three knowledge variables.

Insert Figure 1 about here

Generally, the predicted relationships surrounding foreign institutional knowledge were supported at the 1 per cent level ($F=8.77$, $p=0.005$). Thus, knowledge pertaining to government, institutional frameworks, norms and culture increased alongside international commitment at both the firm and network level. In addition, at the 10 per cent level ($F=3.13$, $p=0.081$), the larger firms in the sample were found to exhibit significantly higher levels of foreign institutional knowledge compared with their smaller counterparts.

No direct effects were detected for foreign business knowledge, however, there was a significant interaction effect at the 5 per cent level ($F=3.44$, $p=0.021$). In terms of the larger firms, the results were close to predictions with the Lonely International firms exhibiting a low level of foreign business knowledge relative to the Late Starter and International among Others firms. The anomaly was that the Early Starter also exhibited higher foreign business knowledge than the Lonely International. For the smaller firms, the rankings for foreign business knowledge were, more or less, opposite to predictions. The International among Others firms possessed the lowest level of foreign business knowledge, followed by the Lonely International, then the Late Starter, with the Early Starter recording the highest level of this knowledge.

Likewise, no direct effects were detected for internationalisation knowledge although, at the 10 per cent level ($F=2.19$, $p=0.097$), there was a significant interaction effect. The predicted relationships failed to materialise for the smaller firms in the sample and only held partially for the larger firms. Basically, amongst the larger firms, The Late Starter and Lonely International firm rankings were reversed.

In sum, Hypothesis 1 is rejected at the aggregate level and when accounting for firm size effects. The Early Starter did not exhibit the lowest levels of the three knowledge constructs. Hypothesis 2 is also rejected at the aggregate level, however, it cannot be rejected for the large firm sample. The larger Late Starter firms exhibited higher levels of internationalisation knowledge, foreign business knowledge and foreign international knowledge relative to the larger Early Starter firms. Hypothesis 3a is partially accepted, both in aggregate and when controlling for firm size, since the Lonely International exhibited higher levels of foreign institutional knowledge than the Late Starter. However, the Late Starter consistently recorded higher levels of internationalisation knowledge than the Lonely International. Hypothesis 3b cannot be rejected at all levels, thus, the Lonely International exhibited a lower level of foreign business knowledge relative to the Late Starter. Hypothesis 4 is rejected at the aggregate level, but cannot be rejected for the large firm sample. The larger International among Others firms recorded the highest levels of all three knowledge constructs.

DISCUSSION AND IMPLICATIONS

The operationalisation of the network model represents a contribution to the field. It provides a foundation from which to explore the interaction between the internationalisation of the firm, the internationalisation of its network and international knowledge. Employing a quantitative approach, the findings suggest that not only is there a link between experiential knowledge levels and the degree of internationalisation of the firm, but that the degree of internationalisation of the network is also influential. This finding may imply that the network acts as some sort of multiplier on the experiential knowledge levels residing in the firm and future research could determine the nature of this impact.

The operationalisation of the network model also provides an avenue with which to improve the development and targeting of export assistance programmes, especially as knowledge is contended to be a key determinant of the internationalisation process. Previous means of classifying firms have generally focused on what problems are associated with a different stage of internationalisation. However, examining the network dimension has permitted this research to identify differences in experiential knowledge levels within groups of similarly internationalised firms.

However, future research may wish to address some of the limitations of this current study. First, a static cross-sectional research design was enlisted to test the association of experiential knowledge amongst the typology of the network model. However, causality cannot be determined from this approach and a longitudinal study would help to identify patterns of knowledge accumulation during the firm's internationalisation process. Second, the measure used to account for the influence of the network may also represent another limitation. Employing product industries as a proxy for a network might be methodologically parsimonious, but it comes at the expense of being able to garner the nuances of the inter-relationships that make a network unique. In addition, the use of a single measure to determine the degree of internationalisation of the network is open to the same criticisms as for single firm level measures of internationalisation. Improvements in the quality of available industry level secondary data may aid future research when operationalising this dimension of the network model. Another limitation is that, by using a the high/low categories of the network model, the internationalisation measures of the firm and its network could be an oversimplification of reality. Future research could employ continuous measures and avoid using the typology classifications.

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FIGURE 1

