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The emergence of a knowledge-based theory of internationalisation

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This paper charts the development of the knowledge-based theory of internationalisation, driven particularly by early research at the University of Uppsala, led by Sune Carlson. Information and knowledge, allied with an interest in the associated effect on risk and uncertainty, were components of a process perspective. Its essence was a focus on the restraining effects of a lack of knowledge as decision-makers contemplated international market entry or expansion requiring a commitment of resources in various forms, in different types of foreign operations (such as exporting, licensing and foreign direct investment). Lack of knowledge of a prospective foreign market (of its characteristics, culture, ways of doing business) was seen to create uncertainty so that firm decision-makers would be less prepared to commit resources. This situation was bound to change as a firm conducted operations in the foreign market and acquired experiential knowledge (learning by doing), which made the foreign market less of a mystery, in the process lowering uncertainty. As the learning process unfolded, and expanded opportunities were perceived, at some stage the firm might be prepared to undertake additional commitments to the foreign market. Empirical research at Uppsala, and in Finland, had shown a pattern of gradual expansion of foreign commitments by internationalising firms. In terms of theoretical development, a key step was relaxation of the assumption of perfect knowledge used in economics (not without critique), noted by Don Lamberton in 1974. Following the development of internationalisation theory in the 1970s, there was a range of extensions to the basic theory, such as the role of networks, the nature of inward–outward connections, and the need for knowledge to pass over language hurdles in the process of international transmission – within and outside the firm. In one sense, the internationalisation of companies was a perfect research site for an exploration of the role of information and knowledge in firm behaviour, given the additional exigencies of the diverse and demanding information environment that is the international arena.

Introduction

It can be said that the 'information revolution' to which Don Lamberton referred in 1974, and to whose emergence he contributed, has fully bloomed. That information and knowledge development have important implications for international expansion and the internationalisation of companies was part of this re-thinking. It was explored by Sune Carlson in the March 1974 issue of *The Annals of the American Academy of Political and Social Sciences,* edited by Don Lamberton and entitled 'The Information Revolution' (Lamberton, 1974). Sune Carlson had initiated research on internationalisation at the University of Uppsala which led to the development of the so-called 'Uppsala process theory of internationalisation'. At heart,

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this was a theory of information and knowledge. It gave expression to the evolving ideas around the reality of information that was less than perfect and the behavioural consequences that this imperfection evoked.

In this paper, research on internationalisation is reviewed through the lens of information and knowledge considerations, with a particular emphasis on emerging ideas around the reality of poor or insufficient, even misleading, information, rather than the assumption of perfect knowledge about foreign markets. Early empirical research on a selection of Swedish companies indicated a pattern of incremental internationalisation, in terms of foreign markets entered and foreign operation modes employed. In seeking to explain this phenomenon, the effect of poor and inadequate information about foreign markets was advanced as an important constraint on the ability of firms to build international operations. This information and knowledge gap was seen to be exacerbated by cultural differences among countries, and accentuated by the resulting communication constraints. Lack of experience in, and knowledge and understanding of, foreign markets, was seen as generating risk and uncertainty perceptions that tend to limit the extent to which firms are prepared to undertake international commitments. Thus, a theory was being forged from new thinking about information and knowledge – the information revolution – as Don Lamberton presciently observed (Lamberton, 1971).

I was a student of Don Lamberton at the University of New South Wales in the Bachelor and Master of Commerce programmes in the 1960s. Don later became my Ph.D. supervisor at the University of Queensland in the 1970s. He became the link to the work on internationalisation at the University of Uppsala in Sweden that became central to my Ph.D. thesis on the internationalisation of the firm (Welch, 1978). Don's edited book, *The Economics of Language* (Lamberton, 2002) heralded an explosion of interest in language, communication and knowledge in the international business field.

A theory emerges

Lamberton (1974, p.ix) states: 'in economic analysis … after long attempting to work with assumptions of perfect knowledge or at least rich and sure information available to all, economists have now embarked upon the development of an economics of information'. Such questioning was not new, as Hayek (1937, p.33) illustrates:

> my main contention will be that the tautologies, of which formal equilibrium analysis in economics essentially consists, can be turned into propositions which tell us anything meaningful about causation in the real world only in so far as we are able to fill those formal propositions with definite statements about how knowledge is acquired and communicated.

Such re-thinking of the nature of information and knowledge was perhaps inevitable in the light of advances in information technology emerging at the time. While awkward for economics, imperfect knowledge began to be seen as an important part of understanding international business behaviour.

Put against the idea of perfect or sure information, when considering the reality that firms face in embarking on international operations, the position in economics seems almost surreal.

> In the traditional theory of trade and investment, we assume that the firm reacts more or less automatically to market changes. If a foreign supplier quotes a lower price or a foreign buyer is willing to pay a higher price than those prevailing on the home market, the firm is assumed to start to import or export respectively. In the real world, where knowledge of foreign markets, suppliers, customers and operating conditions is limited and the flow of information is far from perfect, we cannot assume that firms react in such a way. Foreign operations are different from domestic, and the difference is very much related to the problems of knowledge and cost of information. (Carlson, 1975, pp.19–20)

It was inevitable that a more thoughtful exploration of the role of information and knowledge in business behaviour would emerge, and hardly surprising that this should happen in the international arena: 'Knowledge is, of course, important for all business activity but it seems that it influences international actions even more than other kinds of action. In international activities, uncertainty is generally greater and the difficulties of getting information are also greater' (Carlson, 1973, p.15). In this early exploration, Carlson began to establish the elements of a theory of internationalisation based on the role of information and knowledge.

In a review of the Uppsala research, Johanson *et al*. (1976, p.27) comment that the research carried out at Uppsala on the internationalisation of business firms focused on 'knowledge' as an explanatory factor. As a constraint on the development of international activity, Carlson (1973) stresses the role of information demands, barriers and costs: including collection, transmission and interpretation costs. With Uppsala colleagues, this constraint aspect was expanded to include cultural, distance and time components. Further, this was linked to communication processes and the importance of inter-personal interaction – and thereby the need for international travel with all the costs involved (Carlson, 1974). And many of these costs have not disappeared despite major advances in communication technologies: international travel remains a vital part of international business activity (Welch *et al*., 2007). Driving such costs is the basic need for firms to learn about and understand their potential foreign customers so that they can respond appropriately to the demands of foreign market contexts, including how to interact with such customers in, perhaps, another language and across cultural divides. As Carlson (1974, p.59) notes, 'differences in language, of course, represent a barrier to the transmission of information'. The costs and difficulties associated with overcoming this barrier may be substantial in terms of both communication and collection costs (Piekkari *et al*., 2014).

In the absence of perfect knowledge, firms face uncertainty when making decisions about the commitment of resources to the penetration of foreign markets. Carlson (1974, p.56) stresses the impact of less than certain knowledge on decision-making:

> business decisions are based on opinions regarding the future. These opinions are influenced by that which businessmen know from the past, their existing stock of knowledge, and the flow of information which they continuously receive. However, the opinions are always formed under conditions of uncertainty.

Carlson (1974) and others (e.g. Burenstam-Linder, 1961) point to the difference between the knowledge that a firm possesses about the home market as against foreign markets. Carlson (1975, p.7) adds that 'we may also assume that the uncertainty increases with the degree of "foreignness"'. Carlson (1974, p.58) also refers to the learning involved in seeking to deal with this reality: 'as do many other activities of the firm, the ventures into foreign trade will follow a learning curve'. Further, Carlson (1974) sees information acquisition, transmission and application about foreign markets as a process, with all the potential exigencies and missteps of a process. In so stressing, Carlson lays one of the foundation stones of what emerged as the Uppsala process theory of internationalisation. Learning is the general process by which experience and information generated by a firm's activities are translated into relevant and useable knowledge. The accretion of foreign knowledge was seen as a critical mechanism in a firm's attempts to enter or expand activities in foreign markets by different means.

Somewhat counter-intuitively, firms learn about internationalising by internationalising. Direct involvement in foreign markets, generating practical knowledge, was viewed as a prime way of reducing uncertainty, with face-to-face relations a critical component of this process – generating what became known as 'experiential knowledge'. Arrow (1962, p.155) had earlier observed that 'learning is the product of experience. Learning can only take place through the attempt to solve a problem and therefore only takes place during activity'. In this respect, Uppsala researchers drew on Penrose's (1959) concepts of knowledge within the theory of the growth of the firm. Practical experience takes time to accumulate, and given the costs involved, helps to explain the gradualism in the internationalisation process that was beginning to be shown in empirical studies by researchers at Uppsala University (e.g. Johanson and Wiedersheim-Paul, 1975). Personnel can acquire relevant experience, but there is a limit to this means of acquiring experiential knowledge because it is non-firm specific (Penrose, 1959).

Connected with the importance of information and knowledge for the development and conduct of international operations, and of the learning imparted by involvement in international activities, the constraining effect of risk and uncertainty was a key part of the evolving Uppsala theory of internationalisation. Lack of foreign information and knowledge was viewed as constraining the ability and preparedness of firms to act. But this lack was also constraining in the way it fed into perceptions of risk and uncertainty. Over time, as information flows and understanding about foreign markets increased, this barrier declined, enabling and supporting advances in foreign commitments – within the firm and externally in relation to foreign markets. In general, the position was that decision-makers in firms would seek to reduce levels of risk and uncertainty to tolerable levels, but that tolerance and perception of risk and uncertainty would vary from decision to decision, affected by the experience flowing from continuing international involvement.

While more information was seen as playing a positive role in reducing risk and uncertainty, and this is the general position within the Uppsala process model, questions were raised in the early stages of theory development about whether this was an unalloyed blessing. For example, Nyström (1974) argues that more information may not remove uncertainty, that more information could even result in an increase in uncertainty when the information is confusing, contradictory, or simply wrong. Nevertheless, the argument within internationalisation theory was that the learning process within a firm was focused on the practical demands of international operations. Ensuring outcomes would be relevant, although it could be argued that there is no necessary assurance about the quality and appropriateness of the information generated. And, as Carlson points out (1973), decision-makers will hardly be disturbed by the lack of a specific piece of information if they are unaware of its existence.

So, lack of information is not necessarily a barrier to advances in commitment to internationalisation – the ignorance is bliss phenomenon (Liesch *et al*., 2011).

Internationalisation process model

Emerging ideas about information and knowledge and internationalisation benefited from the empirical and theoretical research being undertaken by a number of researchers at Uppsala (see Johanson and Wiedersheim-Paul, 1975; Johanson *et al.,* 1976). This evolution resulted in a definitive presentation of the Uppsala model by Johanson and Vahlne (1977), which contained many of the elements of a knowledge and learning perspective on internationalisation. It is notable that this paper has become the most cited in the international business field. While the authors have made adjustments to this first version of the model (Johanson and Vahlne, 2009) – for example, an explicit, enhanced position on the role of networks – its core has remained basically unchanged. Johanson and Vahlne (2009) themselves state that the change mechanisms in the revised model are essentially the same as those in the original version and that the basic structure of the model is the same as the one built in 1977. In their first version (1977, p.23), they state:

> we develop a model of the internationalization process of the firm that focuses on the development of the individual firm, and particularly on its gradual acquisition, integration, and use of knowledge about foreign markets and operations, and on its successively increasing commitment to foreign markets.

In essence, the growth of knowledge about foreign markets allowed firms to contemplate increased commitments. The model reflects the critical role of all facets of knowledge acquisition and use as an important explanatory force behind international expansion. It also made clear an emerging departure from the mainstream economics. The model was put forward as an explanation for the pattern of gradual internationalisation exposed in empirical research, particularly longitudinal studies of Swedish multinationals and their internationalisation over extended periods of time.

In its original form, Johanson and Vahlne (1977) postulate that the basic mechanism of internationalisation includes state (market knowledge and market commitment – the extent of resources committed to the foreign market) and change aspects (commitment decisions and current activities). While the existing state of knowledge, including experience in and understanding of a foreign market, and associated uncertainty might constrain preparedness to commit resources to a foreign market, this would change to the extent that there is change in knowledge – particularly as a result of experience from activities in the foreign market. At some point, because of increased market knowledge and reduced uncertainty, a firm may be prepared to commit additional resources, particularly by changing how it operates in a particular market, such as changing from the use of an intermediary to the establishment of a subsidiary operation.

Johanson and Vahlne (1977, p.29) argue that as activities in a foreign market increase, perceived opportunities to raise commitment might arise not only within the entrant firm, but also through what is 'seen by individuals in organizations with which the firm is interacting' in the foreign market. One of the ways in which gradual internationalisation was identified in early Swedish and Finnish empirical research was through following the pattern and timing of methods of foreign operation

(Johanson and Wiedersheim-Paul, 1975; Luostarinen, 1979). The general pattern identified was one of movement over time from lower commitment, lower involvement forms of operation (e.g. licensing and exporting via intermediaries) to higher commitment and higher involvement forms (e.g. sales subsidiaries and eventually production subsidiaries).

A behavioural perspective

Carlson (1975) stresses that development of Uppsala ideas about internationalisation were influenced by the behavioural theory associated with Herbert Simon and the Carnegie School. This perspective is stressed by Johanson and Vahlne (1977), which points to the importance of the behavioural theory of the firm in the theoretical development of their model (Cyert and March, 1963). Nevertheless, Johanson and Vahlne (1977, p.23) specifically exclude decision-makers and their role from their model: 'because we, for the time being, disregard the decision style of the decision-maker himself, and, to a certain extent, the specific properties of the various decision situations, our model has only limited predictive value'. Theirs can be considered a learning theory that deliberately excluded the nature, characteristics and influence of decision-makers. They assume that knowledge of opportunities or problems initiates decisions, and that the key knowledge is experiential knowledge gained from participation in international activities – both general international knowledge and foreign market-specific knowledge. As Shackle (1970, p.341) comments, 'action can be suggested by, and respond to, events outside the mind, only if these events are perceived. But action can itself bring into view what was hitherto latent'. Johanson and Vahlne (1977, p.28) note that experiential market knowledge allowed firms to formulate 'concrete' market opportunities. Experiential knowledge flowing from foreign operations also affected the perceived level of uncertainty, lowering this barrier to increased commitments:

> … the uncertainty effect concerns the market uncertainty [felt by decision-makers] … market uncertainty is reduced through increases in interaction and integration with the market environment – steps such as increases in communication with customers, establishment of new service activities or, in the extreme case, the take-over of customers.

The behavioural perspective associated with expanding ideas about knowledge inevitably drew attention to the role of decision-makers: they were not in possession of perfect information, but instead confronted a world of imperfect and unreliable information. This is what Mintzberg *et al*. (1976, p.251) describe as 'decision-making under ambiguity where almost nothing is given or easily determined' and what drives Shackle (1974, p.1) to see decision as the human predicament. The behaviour of decision-makers matters and is based on what they think, feel, value and have experienced in the business world. Decision-makers become players, not simply agents, the role given to them in the economics of the time. As Cyert and Hedrick (1972, p.399) note: 'the theory of the firm [in economics] is *a priori* in the sense that its behaviour can be deduced from assumptions that describe the environment'.

While not proposing another Uppsala model, some researchers linked to the Uppsala group began to explore the effect on internationalisation decisions of putting decision-makers into a more substantial and purposive role, and considering their background in terms of education, experience knowledge, skills and value system

(Wiedersheim-Paul *et al*., 1978). A behavioural model was used to explain pre-export activity, the step into exporting and the early stages of exporting (Wiedersheim-Paul *et al*., 1978; Welch and Wiedersheim-Paul, 1980a). In emphasising the backgrounds of individual decision-makers as drivers of the export entry process, the model aligned with evolving work in other areas in which the background of decision-makers was a central consideration (for example, Simmonds and Smith, 1968).

In exporting research, there was interest in how decision-makers uncovered and responded to export leads (Olson and Wiedersheim-Paul, 1974). Export behaviour was related to information collection and transmission activity. According to Simpson and Kujawa (1974, p.108), 'this study challenges the assumption of *homo economicus* and seeks to profile the export decision-maker by inquiring (1) into his perceptions of risks and cost/benefit relationships associated with exporting and (2) into his reactions to various hypothesized export stimuli' – arising from, for example, trade missions, trade fairs and customer action. An important aspect of the information available to decision-makers is their limited search behaviour. They rely on readily available sources, often friends and colleagues, and those who can be readily contacted. Such findings emerged from research in the early 1970s, and included research in the field of geography (Törnqvist, 1970; Pred, 1974).

The ferment of new ideas about internationalisation which emerged in the 1970s around a new approach to the treatment of information and knowledge was particularly evident in the Uppsala studies, but not only there. A similar interest had been developing in Finland, with a similar emphasis on knowledge considerations and risk and uncertainty (Luostarinen, 1970, 1979). At the heart of Luostarinen's (1979) model of internationalisation was a 'behavioural decision-making framework'. In this framework, the behavioural factors of limited perception, restrictive reaction, selective search and confined choice (driven by risk and uncertainty avoidance) were presented as generating 'lateral rigidity' in decision-making processes. Organisational learning was viewed as the key to a reduction in lateral rigidity, facilitating new steps in foreign market operations. Importantly, it was stressed that the learning process might raise rigidity – for instance, by generating negative information about foreign market possibilities. Not surprisingly, there was early recognition of the implications of these ideas: negative feedback might lead to de-internationalisation and re-internationalisation.

Extension from early ideas

Putting aside the assumption of perfect knowledge clearly provided the basis for new theories of internationalisation, and for new thinking in other spheres. Following the early theories, there was considerable refinement as studies examined different aspects of the nature of knowledge and its influence on international business behaviour, such as knowledge transfer between parts of the multinational. One clear outcome of this later work was a better understanding of friction in such transfers. It might be important, but transfer could be expensive, as evidenced by the cost of overcoming language boundaries (Welch and Welch, 2008). One aspect which gained increasing attention was networks, of companies and individuals, and the effect they had on the manner and rate at which firms were able to internationalise. For information to be useful, it had to be transmitted, and networks were an important, even critical, element of the process (Ford, 1980). This was recognised in the early work on internationalisation: 'The export start can be categorized as an orientation process and is therefore especially dependent on face-to-face contacts and other types of informal contacts' (Wiedersheim-Paul *et al.*, 1978, p.49). Further, Welch and Wiedersheim-Paul (1980b, p.9) noted, in the Australian context, that 'as the firm's communication network expands interstate, there is a greater likelihood of it being exposed to export market contacts'. The early thinking about the role of networks was influenced by research in economic geography on contact systems, information flows, search behaviour and their links to the spatial aspects of industrial patterns (Törnqvist, 1970; Pred, 1974).

It soon became clear that networks provide access to knowledge about foreign markets, assisting foreign market entry, but that relationships had to be developed for access to relevant and assured knowledge. Sellers must provide information to potential buyers, particularly when dealing in complex products and services. It is not always clear just how much information to provide. Information has to be exchanged, and more than one party may be involved in the exchange process. Both buyers and sellers use exchange relationships to access useful knowledge, and a degree of dependence may develop through social bonding. Companies may deliberately seek relationships with particular firms because they see the benefits of tapping into their specific knowledge and skill systems (Ford *et al.*, 1986). The exploration of the nature of networks and the transfer of knowledge through them took research even further from the ideal of perfect information and costless access.

In extreme cases, such as those involving the sale of intellectual property rights, providing full information about a product and its workings may render the need to buy superfluous. However, restricting information to the point of hampering evaluation of a product may lead to the termination of negotiations (Welch, 1985). In many industrial marketing situations, sellers have to reduce uncertainty on the potential buyer's part in the attempt to win a sale, but without any assurance of a sale (Håkansson *et al.*, 1976). The industrial marketing research in Uppsala, which developed in concert with the work on internationalisation, focused on the relationship processes in which communication and information transfer were embedded (Ford, 1980). Such relationships typically took time to develop and often endured. Beyond engendering a process perspective on marketing and internationalisation, they provided an important context for understanding why empirical studies about firm internationalisation indicated gradualism in the development of international operations.

Role of personal networks

While much of the early research on networks is concerned with connections among firms, there was an inevitable interest in personal networks, particularly given the focus on decision-makers and their influence on decision-making. According to Arrow (1969, pp.33–34), 'all the sociological work on diffusion [of knowledge] has put great stress on personal contact … personal contacts across nations are obviously much less than within'. Turnbull (1979) points to the critical importance of personal contacts in interaction between buyers and sellers in industrial markets, finding these to be the primary mode of communication, accentuated in the international arena with many distance constraints and raised levels of risk and uncertainty. Based on his knowledge of Italian exporters, Bonaccorsi (1992) concludes that decision-makers strongly prefer personal and direct sources of information. For Italian entrepreneurs, personal networks and friendly relations with entrepreneurs in other exporting firms in their industrial districts are critical in reducing risk perception because of the 'first-hand information [which] is available about opportunities in foreign markets' (Bonaccorsi, 1992, p.629). Further, as Ambler and Styles (2000, p.501) point out, 'the apparent paradox is that under conditions of greater uncertainty associated with an international market (*vs.* the domestic market), particularly upon first entry … managers rely (more) on socially generated subjective knowledge'. But while networks can be a source of uncertainty-reducing knowledge (Nyström, 1974), this is not their inevitable role. Networks can deliver information which is confusing, disquieting and unhelpful, resulting in a perception of increased risk and uncertainty attached to a foreign venture (Welch *et al*., 1996; Liesch *et al*., 2011).

Inward–outward connections in internationalisation

In the development of ideas about internationalisation, inward processes have received relatively limited attention. Nevertheless, there was interest in this aspect from the earliest stages, although it has recently been re-discovered, viewed from the perspective of connections between the inward and outward sides (Luostarinen, 1970; Håkansson and Wootz, 1975; Welch and Luostarinen, 1993). A large study of Finnish SMEs revealed that more than half internationalised first on the inward side (Korhonen *et al*., 1996). The processes leading from inward to outward operations can be subtle and removed in time within the firm, with limited awareness of their operation (Korhonen, 1999). Nevertheless, information flows (e.g. from potential foreign suppliers), learning about foreign markets, and experience in undertaking international operations (through importing or inward technology licensing, for example) proved to be relevant to outward internationalisation. Finding appropriate suppliers in a foreign market may provide knowledge (market and cultural) that can be readily used in a later exporting exercise. Inward–outward processes reveal something of the complexity of information and knowledge development processes in internationalisation.

De-internationalisation/re-internationalisation

Internationalisation does not inevitably move in one direction – reversal is feasible and even common, sometimes to the point of complete withdrawal from international involvement (Benito and Welch, 1997). Early research noted cases of withdrawal by firms in pre- and early-exporting stages (Welch and Wiedersheim-Paul, 1980a). The reversal process may take some time and be subject to factors not experienced in internationalisation. Problems encountered early in internationalisation may limit commitment to international involvement (both psychologically and in terms of resources committed) so that withdrawal can be more readily contemplated. Should problems occur in later stages, after commitment of resources, withdrawal will not be as readily undertaken. And there may be a high level of management commitment to the point where additional resources are committed as an alternative to starting the reversal process (Drummond, 1995; Benito and Welch, 1997).

De-internationalisation to full international withdrawal may not be the end of the story. At some stage, re-internationalisation might occur, in the same or different form. It is not an uncommon occurrence (Welch and Welch, 2009). This might involve the same firm, moving out from a retained domestic base. Knowledge, networks and staff retained from previous international activity will provide support for renewed foreign operations, and faster market entry than otherwise should be feasible. Italian small firms display serial foreign entry and exit behaviour, as do project firms (Bonaccorsi, 1992; Welch *et al*., 2007). Project firms in particular seem to recognise the value of retained networks for future business.

Time

As Johanson and Vahlne (2009) point out in the network version of their Uppsala model, entry to some networks facilitates rapid expansion in certain foreign markets. But firms start as outsiders and finding, penetrating and utilising some foreign networks may take considerable time. This is what Johanson and Vahlne call the 'liability of outsidership'. The learning process takes place on many levels (learning which networks have useful information, learning how to extract relevant information, and ensuring its reliability) and is made the more difficult in the international arena by distance and differences in culture, language, and political and business systems. Acquired information then has to be transferred to the relevant individual or department within a firm – a challenge in itself – to ensure its usefulness (Korhonen, 1999).

Time is also needed to create trust, and trust is important in internationalisation. As Johanson and Vahlne (2009) point out, trust is a prerequisite for commitment and can substitute for knowledge. The substitution of trust for knowledge is a common aspect of international business operations: if others are trusted in the foreign market, then they can be left to handle various marketing and operational tasks. Johanson and Vahlne (2009, p.1421) maintain that: 'There is nothing in our model that indicates that international expansion cannot be done quickly … as long as there is sufficient time for learning and relationship building'. Trust creation is also part of the process of risk and uncertainty reduction that facilitates extended commitments to international operations. Many of the elements described above as part of the internationalisation learning process can be short-circuited by relevant experience and contacts acquired by individuals in other firms.

Language differences

One of the factors constraining foreign market entry, and the communication process between the internationalising firm and the foreign market, is language. The impact of language differences has not been readily removed by technological advances in machine translation, the rise in English as an international business language, or the use of an official corporate language by multinational companies for inter-unit communication (Welch *et al*., 2001; Piekkari *et al*., 2014). Language was one of the variables included in the early work on the composite psychic distance in the first Uppsala internationalisation model (Johanson and Vahlne, 1977), in Luostarinen's (1979) lateral rigidity theory of internationalisation (referred to as 'cultural distance'), and also alluded to by Arrow (1969) as a restrictive factor in international knowledge transfer.

Over the last two decades, there has been a resurgence of interest in the effect of language on internationalisation. The positive role of networks in internationalisation was stressed above, but without a common language, networks will not form or will be constrained (Piekkari *et al*., 2014). Perhaps more surprising has been the research on the effect of language on the internal communication and management processes of multinationals. The ability to control and bind together the many parts of the multinational's disparate empire is weakened to the extent that it has to operate as a multilingual entity. Take a single illustration: in order to transmit its corporate values statement to its 330,000 global employees in 2010, Nestle first had to have the statement translated into over 50 languages (Welch and Welch, 2015). The potential for mistranslation and misinterpretation in daily communication is considerable.

Individuals with multiple language skills may be able to control communication, acquiring considerable personal power in the process. Internationalisation decisions are sometimes made on the basis of the availability or transferability of such individuals. Subsidiaries can become isolated by inability to cope with communications in the corporate language. Language differences can result in knowledge being blocked, distorted, filtered and re-arranged before it ever reaches decision-makers (Welch and Welch, 2008). In general, language still plays a part in ensuring that psychic distance remains a constraining influence on internationalisation.

Knowledge transfer

To be useful to others, knowledge has to be transferred in a form readily understandable by recipients, within or beyond the firm. It then has to be implanted in the recipient organisation and used for commercial benefit. There are many aspects to this process, particularly when the transfer is between independent parties in different nations. Steps may include searching for new knowledge, obtaining it via negotiating and paying for access, transferring knowledge to the recipient organisation, implanting it and transferring it to the various parts of an international business network. There are many hurdles along the way. Personal and company influences merge in the process – sometimes positively, sometimes negatively (Szulanski, 1996). For example, there is no certainty that individuals will apply their language skills to ensure timely transfer of knowledge across language barriers (Piekkari *et al.*, 2013). Thus, although the Uppsala internationalisation model stresses knowledge as a positive force in enabling and supporting increasing international commitments, there is much that can go wrong in the knowledge transfer process.

Conclusion

As one looks back on the emergence and flowering of a knowledge-based perspective on internationalisation, one wonders whether the theory would have the same impact had it emerged in the current age of 'information abundance'. In some respects, we seem to have come closer to the original economic assumptions of 'perfect knowledge or at least rich and sure information' (Lamberton, 1974, p.ix). Through the Internet, it is possible to obtain a treasure trove of information about foreign markets and potential customers, foreign government regulations and the like. Has the knowledge constraint on internationalisation been, if not removed, at least substantially reduced? What can be said is that an avalanche of information is not the same as knowledge or understanding. Information overload ensures that the significant information tasks of evaluation and interpretation of concern to Sune Carlson (1974) have become even more demanding. Useful information has to be separated from the mass of dross. False information abounds, as does that which is deliberately misleading. Market leads may be about criminal, nefarious or corrupt endeavour. The information treasure trove may actually be valueless.

Risk and uncertainty remain and it is difficult to say whether firms and individuals embarking on international business operations are more assured today than they were five decades ago. For example, despite all the developments in machine translation, transmitting information across language barriers is still awkward and costly (Piekkari *et al*., 2014). It is little wonder that international business travel remains so important, and has been increasing, despite the use of the Internet (Welch *et al*., 2007; *Economist*, 2015). In some respects, it is even more important in the Internet age as face-to-face interaction provides a level of assurance that is difficult to obtain otherwise. As was noted in the early Uppsala work on internationalisation, obtaining reliable information in the international arena, by whatever means, is more costly, slower and demanding of staff time than obtaining reliable information in domestic markets (Johanson and Vahlne, 1977). Despite all the technological developments associated with the information revolution, there is still no information nirvana.

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