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Internationalisation Theory and Born Globals

Abstract

Purpose

It has been claimed that Born Globals are incompatible with the Uppsala model, which is based on the firm having a maximum tolerable risk level. This assumption was used to explain observed incremental commitments, with further commitments being made as experiential learning reduces the level of risk faced. It will be argued that adding a consideration of the role of expected value, including the effects of resource constraints, can reconcile the Born Global and internationalisation process literatures.

Design/methodology/approach

The theoretical arguments are supported by mathematical modelling of a firm pursuing expected value based on subjective beliefs.

Findings

While the effects of risk and expected value coincide when firms limit their downside risks by taking an incremental approach to commitments, other factors impacting on expected value can shift the balance of incentives towards earlier and more rapid internationalisation. For instance, some firms are specialised and have high costs of R&D, and so need to achieve early and rapid growth but face small home markets. While resource constraints can lead a firm to expand for some time in its home market before internationalising, the effect can be reversed in the case of the finance constraint for some firms.

Originality/value

Shows how Born Global and Internationalisation process literatures can be reconciled though a consideration of the effects of expected value on internationalisation decisions. Provides a novel theoretical analysis of Born Globals.

Introduction

Literature on internationalisation is split between the incremental and the so-called “Born Global” approaches. The former involves gradual step-by-step commitments whereas the latter involves internationalisation soon after firm birth which is then often rapid and tends to be regional rather than actually being global. Born Globals are therefore sometimes instead referred to as “International New Ventures”. They are also sometimes defined more specifically in terms internationalisation having been part of the plan for the firm at the time of founding. It has been claimed that they are inconsistent with (incremental) internationalisation theory (Knight and Liesch, 2016). Not only has internationalisation theory been criticised by Born Global literature but Born Global literature has itself been said to be in desperate need of theoretical development (Keupp and Gassmann, 2009; Knight and Liesch, 2016: 98). A recent review of the literature has confirmed that there are few studies on the intersection between the incremental view and born-global literature, and that this has resulted in significant knowledge gaps and conflicts (Paul and Rosado-Serrano, 2019). Nonetheless, the two literatures have a lot in common (Gulanowski et al., 2018), particularly when more recent work on the incremental view is taken into account.

The incremental view is still based on the Uppsala model (Johanson and Vahlne, 1977). Some Born Global literature has deemed it to be out of date (Oviatt and McDougall, 1994). This article seeks to show that the limited nature of the risk-based assumption of the Uppsala model is too restrictive to properly allow for Born Globals and how a straightforward consideration of wider issues involved in internationalisation can address the problem. It is intended to be broadly consistent with other recent contributions that have sought to expand on the Uppsala model, such as those concerning networking and entrepreneurship. The Uppsala model involves incremental commitments being made as market uncertainty is reduced through experiential learning. It was assumed by Johanson and Vahlne (1977: 30) that incremental commitments result from the firm having a maximum tolerable risk level (Figueira-de-Lemos et al., 2011). This was supported by the further assumption that when the firm expands it does so on the expectation of large returns (Johanson and Vahlne, 1977: 30). The firm's current risk level is reduced as experience is gained of the markets in which it operates, unless they are very unstable, so allowing further commitments. Experiential learning also helps the firm to identify opportunities for further commitments and to deepen relationships between firms (Johanson and Vahlne, 2006). The Johanson and Vahlne (1977) assumptions were designed to explain patterns of internationalisation observed at the time, where the firm internationalises gradually, entering markets at lower psychic distance first. The model is also often described as a stage model (Bell and Young, 1998). The stages had been previously identified based on case study evidence (Johanson and Wiedersheim-Paul, 1975) and are: no regular export; export via agents; establishment of foreign sales subsidiary; and overseas production. This is also known as the "establishment chain". Partly building on the Uppsala model, innovation-related internationalisation models have similarly viewed the firm as passing through stages which represent a learning sequence (Andersen, 1993).

What is needed for the incremental view to be reconciled with Born Global literature is for the maximum tolerable risk level aspect of the Uppsala model to be broadened to consider both the forces explaining incremental internationalisation and opposing forces that can lead to earlier and faster internationalisation. In particular, the effects of expected value need to be taken into account. The balance of forces then determines the overall incentive. For instance, it will be argued that the recurrent fixed costs of R&D of small high-technology firms can give strong incentives for fast and early internationalisation despite the risks involved. The combination of high risk and potentially high returns will sometimes mean that such firms are supported by venture capital investors so that the bearing of the risk involved with each firm is diversified through portfolio investment. Although this could then give each firm a higher toleration of risk, it cannot be understood without a more detailed analysis than that currently offered by the Uppsala model.

The risk-based aspect of the Uppsala model is, however, more compatible with Born Global firms under conditions where the commitments involved do not entail a great deal of risk. Low risks can result from low costs of internationalisation, such as could be achieved through online sales. A firm can have a virtual presence in foreign countries, so at least partly avoiding the costs a physical presence. Born Globals may also face lower uncertainty in internationalising where their founders have significant international experience (Madsen and Servais, 1997) and where market requirements are relatively homogenous. Johanson and Vahlne's (2006, 2009) later writings also overlap with Born Global literature in stressing entrepreneurial opportunities, relationships between firms, and social capital. They have also pointed out that their approach does not preclude fast internationalisation where knowledge and relationships are already in place when the firm is founded (Johanson and Vahlne (2009: 1421) and have recently stressed the importance of capability creation (Vahlne and Johanson, 2017). Additionally, Hashai and Almor (2004) found that a sample of knowledge-intensive born globals with a small home market took a staged approach to rapid

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internationalisation, beginning with exporting. On the other hand, some firms do become multinational early on in their lives (Vanninen, Kuivalainen and Ciravegna, 2017).

Born Globals are of special interest as MNEs in part because they internationalise with limited resources and focus on narrower market niches than large MNEs. Their small sizes will tend to make them more flexible and dynamic (Vossen, 1998). They are also of special interest as SMEs partly because they may have a relatively high chance of being among the small proportion of them that end up both being innovative and growing significantly (Lee, 2014; Stam and Wennberg, 2009), so having a much greater economic impact than most. They can also be beneficiaries of knowledge spillovers (Acs et al., 2013), sometimes within industrial clusters (Moen, 2002), but also help to diffuse innovation internationally. Their small sizes mean that they often form alliances in order to offset their resource limitations in growing and internationalising (Mohr et al., 2013). Knowledge-intensive multinational SMEs also sometimes externalise production and focus on selling to customers that make relatively small numbers of high-value transactions (Almor and Hashai, 2004), so potentially further helping to reduce the impact of resource limitations and the costs of internationalisation.

In some cases, reduced costs of internationalisation will be essential to the viability of niche high-technology firms with small home markets. Born Globals are likely to be more dominated by high-technology firms in large countries such as the United States (Madsen and Servais, 1997). Factors such as reduced costs of international transportation and travel, reductions in state imposed barriers to internationalisation, modern information technology, technologies that have reduced the costs of lower-scale production, and an increase in the number of people with international experience may have helped to increase the number of firms exploiting niches across multiple countries (Madsen and Servais, 1997; Rialp et al., 2005). Additionally, the “fine slicing” of global supply chains (Mudambi and Venzin, 2010) means that Born Globals can sometimes act as parts of the supply chains of large MNEs (Meyer and Xia, 2012).

However, not all Born Globals are high-technology firms and nor are they an entirely new phenomenon. There is evidence of Born Globals existing outside of high-technology industries in countries with small markets, such as seafood firms in New Zealand (Knight et al., 2001). This illustrates that there are different types of Born Globals (Reuber, Dimitratos and Kuivalainen, 2017). For instance, some existed previously in traditional industries, some internationalise relatively cheaply (Hennart, 2014), sometimes with the help of internet-based sales (Gabrielsson and Gabrielsson, 2011), and some are high-technology firms relying on changed conditions to incur significant costs of R&D in order to serve niche markets that are small in individual countries, but achieving economies of scale through internationalisation.

This article’s analysis addresses dynamics but is consistent with the rational action modelling tradition of internalisation theory and its central focus on the exploitation of knowledge. Internalisation theorists have sometimes been criticised for being mainly focused on static analysis (Buckley and Hashai, 2005), though those focusing on dynamic capabilities have also been said to have been slow to incorporate internalisation theory into their work (Rugman and Verbeke, 2008). However, internalisation theorists have not been silent on internationalisation processes. In particular, Casson (1995: 89-121) has previously provided a model that is similar to the analysis presented here in some respects, analysing internationalisation in terms of sequential versus parallel investments. Casson’s model was, however, not aimed specifically at Born Globals, in contrast to the focus here. Note that, while the simple mathematical expressions included below are based on rational choices (given the probabilities), they are made under conditions of incomplete information. Also, the probabilities are assumed to be subjective, so involving judgement in the Knightian

(Casson, 2005) tradition of entrepreneurship theory. It should be noted, of course, that subjectivity introduces the possibility of bias. For instance, an entrepreneur may be biased towards over-optimism and so undervalue the advantages of a more incremental approach. However, it may be that others also have to be convinced, such as partners and equity investors.

First the logic for choosing either a sequential (incremental) or, alternatively, a parallel (simultaneous) approach to making investments will be considered. This is essentially equivalent to considering a slower (or later) vs. faster (or sooner) approach to internationalisation. However, there are different elements to this, particularly the timing of first internationalisation and the breadth (in terms of number of countries) and depth (in terms of the degree of commitment) in each country (Hashai, 2011). Learning will be considered as having two types of effect. Firstly, it changes expectations. Secondly, it can improve the firm's capabilities and aspects of its resources, including through the building and strengthening of network relationships and development of its technology. Then the discussion will move on to cover the two different forms of learning in more detail, both of which create incentives for a sequential approach. Factors that favour a parallel approach will also be considered, including economies of scale. The basic logic of incentives regarding the direction of sequential investments will then be examined, demonstrating that it is not always a case of lower psychic-distance first. Consideration will then be given to financing. While it might normally be expected that resource constraints will lead to a more incremental approach, it will be argued that in some cases the capital constraint can instead favour rapid internationalisation. Unlike most small firms, it will be assumed that the firm's owner-manager(s) have significant growth aspirations. It will also be assumed that internationalisation has the potential to be profitable for the firm, at least if things turn out to be on the positive side of expectations.

An Expanded View of Internationalisation

Let us say that there are two investments that can be undertaken. Each has its own expected value. Should they be undertaken sequentially (incrementally) or in parallel? So long as they are entirely separate, and each has a positive expected value that is not increased by delay, they should be undertaken in parallel in order to avoid one of their present values being discounted. However, learning can provide a logic for performing them sequentially instead (Cyert et al., 1978). This can be partly thought of as an application of real options reasoning (McGrath, 1999; Casson and Gulamhussen, 2004; Rugman and Li, 2005). Initial commitments are limited, the firm waits to see what happens, and then decides whether to exercise one or more real options. For instance, it can carry out further growth in its home country and then decide whether to internationalise to another country. Alternatively, it might commit to a limited investment in internationalisation and then decide whether to commit to further investment. Either way, the effects of risk aversion and of pursuing expected value coincide in as much as making limited earlier commitments often increases expected value through the reduction of downside risk. The predictions of the Uppsala model will therefore hold when expected value is pursued, so long as the circumstances do not override incentives to make commitments in an incremental fashion. Note that real options literature has been criticised for assuming that information is gained exogenously (Adner and Levinthal, 2004), and so a broader view combines the insights of real options thinking with endogenous aspects of information gathering (Wadeson, 2010). In other words, undertaking experiential learning is different to simply waiting and hoping for favourable conditions. It involves making decisions that determine both the timing and nature of the learning that will take place. This is clearly relevant to internationalisation where there may be many possible ways of proceeding next. Nonetheless, broader insights from real options literature concerning the value inherent in decision options, such as the potential of limited commitments, remain valid in types of decisions to which the assumptions

underlying real options, in the stricter sense of options that are similar in their informational characteristics to those traded on financial markets, are not well matched.

Learning: changing beliefs and expectations

Consider a simplified case where the pursuit of expected value means that learning can incentivise a sequential approach to investments. There are two investments to be made, *A* and *B*. Each has a one-off sunk cost. They could be carried out sequentially, with *A* being made first, or they could be carried out simultaneously (in parallel). *A* costs c_a and *B* costs c_b. If successful then investment *A* will yield a return of V_a and investment *B* will yield V_b. These returns are both net present values of future cash flows at the time when each investment is made. For simplicity, assume that the firm's cost of capital, *r*, has a given value, rather than being treated as a variable determinant of V_a and V_b. If either investment is unsuccessful then it yields a return of zero. There is a subjective probability $p(a)$ that investment *A* will be successful and a probability $p(b)$ that investment *B* will be successful. Assume, for simplicity, that the decision maker is risk neutral.

As mentioned above, the fact that the decision making is subjective means that it can also be described as entrepreneurial (Casson, 2005). The identity of the entrepreneur matters in terms of what expectations are formed, both in terms of the knowledge that is held and how it leads to the formation of beliefs about the future. The importance of the identity of the entrepreneur is also important in terms of the firm's managerial capabilities, as stressed by Born-Global literature (Madsen and Servais, 1997; Matthews and Zander, 2007).

Carrying out either investment establishes whether it is a success. However, there are believed to be common factors partly determining the successes of *A* and *B*. So, if *A* is carried out first, then the result affects beliefs about the probability of the success of *B*. The revised subjective probability that *B* will be successful if *A* has already been successful is $p(b|a)$. If the investments are carried out sequentially it is assumed that if *A* is unsuccessful then the resulting downward revision in the probability of *B* being successful means that *B*'s expected value becomes negative and so it does not then go ahead. A sequential approach can therefore have a higher expected value than a parallel approach because the information gained from investment *A* allows a more informed decision to be made over whether to undertake investment *B*. There is a discount factor of *d* (0<*d*<1), where *d*=1/(1+*r*). Assume that a sequential approach delays the decision about whether to undertake investment *B* by a single time period.

The expected value of sequential investments is therefore:

$$p(a)(V_a + d(p(b|a)V_b - c_b)) - c_a$$

While the expected value of carrying out the investments in parallel is

$$p(a)V_a + p(b)V_b - c_a - c_b$$

Therefore, a parallel approach will have a higher expected value than a sequential (incremental) one if:

$$(1 - dp(a))c_b < (p(b) - dp(a \cap b))V_b$$

The left-hand side of this inequality represents the expected cost saving of a sequential approach due to the chance of the second investment not being undertaken, while the right-hand side represents the associated loss in expected return from the second investment. A high expected value from investment *B* favours a parallel approach. High expected value includes a high probability, $p(b)$, as well as a high return, relative to cost, if successful. Conversely, significant initial

doubt over the successes of both *A* and *B*, with doubt over *B* being substantially reduced if *A* is successful means that the learning effect is strong and so favours a sequential approach. In other words, if there are perceived to be significant common factors involved in determining the successes of both *A* and *B*, and if doubts over whether they are favourable are significantly resolved if *A* is successful, then the learning involved in a sequential approach will be believed to be valuable. This is similar to key findings of the Casson (1995) model. Casson put it in terms of learning in a sequential approach to entering different markets being valuable when the markets are of the same type.

The logic of such pairwise comparisons can be applied to a wide variety of different types of investments, representing not only commitments to different markets but also different commitments to the same market. For instance, investment *A* could represent a further home-market investment and *B* a first investment in entering a foreign market. In this case, learning from previous commitments in the home market, building on relatively strong initial home-market knowledge, may mean that $p(a)$ is high. If the success of the investments *A* and *B* are thought to depend to a large extent on common factors then $p(b)$ will also be high. On the other hand, if there are thought to be significant dissimilarities between the home and foreign markets then significant doubt could remain about *B* even after *A* is successful. Either way, if further investment at home is expected to yield little useful learning in respect to investing in the foreign market then this will then favour a parallel approach, internationalising at the same time as increasing commitments in the home market. However, other factors, such as resource constraints, might still lead to a sequential approach being used instead, in which the firm continues to grow just in its home market before internationalising. One reason for demand in different countries to depend on similar factors would be a product having superior functional characteristics based on a technological advantage, rather than on tastes which vary between countries. This is consistent with the fact that some Born Globals are high-technology firms with leading technologies. It has also been argued that Born Globals are partly the result of an increased homogeneity across markets and that market uncertainties are reduced by the fact that Born Globals are often founded by people with strong international experience (Madsen and Servais, 1997).

The incentives for taking a sequential approach, in order to learn more about the likely success of entering a further market, are also reduced where there are forms of internationalisation available that are of low cost, such as exporting based on sales generated on the Internet. There is then simply less to lose from a parallel approach. Use of the Internet can also be a means for firms to gain knowledge related to internationalisation (Glavas at al., 2019). Economies of scale, such as those resulting from recurrent fixed costs of R&D, can also favour a parallel approach, as will be considered below. However, note that real-life approaches will actually often involve a mixture of sequential and parallel elements. For instance, a firm may enter more than one new market in parallel but follow a sequential approach in each one, and then expand into further markets later.

Note that a sequential approach to commitments to a market will sometimes make it attractive to make an investment where otherwise none would be made, for instance where *A* is a cheap initial entry into a foreign market and *B* represents a more expensive commitment. Investment *A* can then act as a cheap experiment to test the water. A single large investment may have a negative expected value whereas a sequential approach may have a positive expected value, even where the initial investment is believed to have a low probability of success. So an incremental approach can allow the firm to avoid the error of failing to make profitable investments just as it can also allow it to limit the amounts spent on unprofitable investments.

Learning: improving capabilities and resources

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It is also necessary to take account of the fact that experiential learning can reduce the costs and increase the potential returns of subsequent investments, rather than just yielding information about likely success. Consider an example. Again, there are investments *A* and *B*. However, if *A* is carried out first then at least some of the cost of undertaking *B* is avoided. Say that the cost is reduced by the amount c'. This is because the experience of carrying out *A* then allows investment *B* to be carried out more efficiently. Assume also that, due to learning, the returns to investment *B*, if it is successful, will be increased by *v'* if *A* is carried out first. So now a parallel approach will have a higher expected value if:

$$(1 - dp(a))c_b + dp(a)c' < (p(b) - dp(a \cap b))V_b - dp(a \cap b)v'$$

One aspect of this is learning how to operate on a larger scale and with greater complexity. This illustrates that, in considering the internationalisation of SMEs, it is important to take account of the fact that learning goes beyond gaining knowledge about markets, even in the case of purely market-seeking internationalisation. An SME goes through substantial changes as it grows (Penrose, 1959). At a very small size its workers may be directly managed by its owner-manager(s) through close and frequent interactions. However, as the firm grows there is more need for delegation. The first employed manager may well have been taken on by the 20 worker firm size and a team of employed managers tends to be in place by the 100 worker firm size (Atkinson and Meager, 1994). As it grows it will also need to make a transition from informal arrangements to a greater use of formal procedures and planning. Stage models of growth recognise how the nature of the internal organisation of the firm fundamentally changes as it grows (Churchill and Lewis, 1983), although they have been criticised as being overly linear. However, some SME owner-managers do not have the skills or inclination to run a firm of increased size or to effectively manage firm growth. Another view, expressed in the Born Global literature, is that there are advantages to internationalising early as otherwise the firm may develop learning impediments, becoming less flexible. This was suggested by Autio et al. (2000: 919-920) in order to attempt to explain their finding that firms that internationalised earlier also grew faster internationally. In terms of the approach taken here, another explanation is that factors that encourage early internationalisation can also encourage faster international growth.

Learning may also concern how to better serve a particular market. Costs of foreign marketing in any particular country may fall as the firm gains experience of the market and becomes more embedded in its networks. It is also possible that serving customers in different countries and other networking abroad will help the firm to develop its technology (Coviello and Munro, 1997). SME internationalisation can also centre on resource-seeking motivations (Hewerdine et al., 2014). A firm, for instance, may invest in forming and developing a relationship with a foreign partner firm, sometimes further developing its product, before then building on its improved position to widen the scope of its internationalisation.

Parallel investments and greater returns

Consider now cases where, under a sequential approach, the return to carrying out investment *B* in the second time period is again changed by the value *v'* but is now reduced (*v'*<0) rather than increased. The effect may be quite substantial, potentially impacting cash flows over many future time periods. Firstly, consider the issue of market foreclosure. The firm's competitive position may be damaged by delays in entering foreign markets if it has innovated and has a lead on competitors that will decline rapidly if it is slow to build market presence, because they will catch up whether through their own innovations or through imitation. For some products, there will be network externalities (Shy, 2011), where the firm can be in a race to establish critical mass in each market.

Parallel internationalisation in order to achieve pre-emptive market entry was stressed by Casson (1995). However, in the case of Born Globals, it can be argued that it may not always be the driving force. High-technology Born Globals will often have significant leads in their specialised fields, partly the result of knowledge spillovers, while large firms will tend not to find it worthwhile directing their R&D efforts to addressing small market niches. Early internationalisation by some high-technology Born Globals may be driven more by other concerns, such as those resulting from high fixed costs of R&D or the need to access foreign resources. On the other hand, some other Born Globals will be more focussed on building market presence and brands, including high-technology firms whose technological leads are less secure. Successfully gaining a greater market presence then also helps them to invest more in R&D, as costs become spread over larger sales.

There are also further possibilities for there to be a temporary opportunity to make relatively large returns, so that the stream of cash flows that can be realised from the investment is then damaged by a failure to take advantage of the opportunity quickly. An example would be where a particular foreign market is currently booming and so it is temporarily relatively easy to win business. Such a case would also involve a relatively high probability of successful entry.

Parallel investments and economies of scale

Assume now that there are firm-level economies of scale, such as those resulting from recurrent fixed costs of R&D. This can result in high returns to successful entry into new markets, particularly where it results in pricing with a high mark-up over the marginal cost of production, meaning that V_b above can be large. So it can favour a parallel approach to market entry. Pricing partly depends on the costs of any competitors, the degree of internationalisation of their sales, their home-market sales, and the degree to which the firm's product is differentiated. If offering a particular type of product inherently involves high costs of R&D and there are existing competitors with large sales then they will have achieved substantial economies of scale. A firm operating on a significantly smaller scale will therefore need a differentiated product, such as one based on a technological advantage. Those entrepreneurs who launch ventures despite being faced with both high costs of R&D and small home markets will often need to attempt early and rapid internationalisation. This is consistent with evidence from SME literature on firm growth. For instance, Audretsch (1991) found lower survival rates among start-ups in industries with significant economies of scale, suggesting that growing to a size closer to the minimum efficient scale was a key factor in firm survival. Computer software is an example of high mark-ups of prices over marginal costs of production, where the cost of supplying an extra customer can be simply that of allowing an extra download, whereas the price reflects the costs of development and the protection afforded by intellectual property rights. However, the wider costs faced vary between firms depending on factors such as what support services are offered and the sales and marketing efforts required to sell into the new market (Hennart, 2014).

Path of internationalisation

Johanson and Vahlne (1977) noted that firms tend to internationalise first to countries with which they have a low psychic distance. From an expected value perspective, it is easy to show that this need not always be the case. Say now that investments *A* and *B* are in internationalisation to two different countries and that either may be carried out first. Then, when investing sequentially, investment *A* first is preferred to *B* first if:

$$p(a)(V_a + d(p(b \mid a)V_b - c_b)) - c_a > p(b)(V_b + d(p(a|b)V_a - c_a)) - c_b$$

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In other words, the choice of the path of investment is a matter of expected benefits as well as costs (Wadeson, 2004). For instance, Moen (2002) found many Norwegian Born Globals considered their most important foreign market to be a non-Nordic country. Such countries included geographically distant ones such as the United States, Brazil, and Saudi Arabia. For a specialised firm closer markets may be significantly less profitable than some more distant ones. For instance, only particular countries may have concentrations of the relevant types of potential customers. Existing network connections and reduced costs of internationalisation may well, however, also be important in decisions to pursue potentially lucrative distant markets. Johanson and Vahlne (2009: 1421) have argued that psychic distance applies at the level of the decision maker who may have contacts and experience far from the home country.

A further point is that the path of internationalisation will often be dynamically determined. Indeed, some have criticised the Uppsala model as being overly linear (Santangelo and Meyer, 2017). The path will be dynamic because learning and the forming of network connections influence the choice of the subsequent path of commitments. For instance, poor performance in a distant market can lead subsequent internationalisation commitments to be focused closer to home. Strong performance in a particular location, on the other hand, can lead to further commitments in that location and to other locations in which success is believed to depend on similar factors. Additionally, sometimes investments will be triggered unexpectedly by outside actors, including by chance encounters (Crick and Spence, 2005). One example of this would be a significant customer unexpectedly requiring supply overseas. The firm might equally be approached by a new foreign customer or sales agent. While such outside influences change the nature of the internationalisation process, making it still less pre-defined, they are not incompatible with the approach discussed above. For instance, serving an existing customer abroad or responding when approached by a foreign firm can both reduce the costs internationalisation and increase its probability of success.

Financing

It might be expected that resource constraints will often tip the overall balance of incentives towards a sequential approach. However, it will be argued that for some firms the effect is reversed so that the relative attractiveness of a parallel approach is increased instead. It has been explained above that the effects of risk aversion and of the pursuit of expected value are often similar. A further reason for this is that there may be a risk of insolvency if the firm grows quickly. It may not be able to raise enough extra finance (Bonnet et al., 2016) to continue if it faces setbacks while trying to grow quickly because running out of funds is seen as a signal of underlying weakness by financiers operating under capital market imperfections and concerned by the relatively high failure rates of small and young firms (Acs and Audretsch, 1990; Block et al., 2018). High-technology SMEs, specifically, often require significant amounts of finance and may take some time to achieve profitability.

The firm may be much safer from insolvency if it is able to grow to a sufficient size to achieve overall profitability based on home-market sales alone before subjecting itself to the additional uncertainties and costs involved in internationalisation. Even if it needs new finance following the failure of an attempt at internationalisation, it may be much more likely to be able to raise it if it is a viable ongoing business based on its home sales. However, this depends on the home market being large enough for this to be achieved given the level of the firm's fixed costs. If the home market alone is too small to allow the firm to be profitable then insolvency may be more likely if it is slow to internationalise.

Say that *f* represents the per-period fixed costs of the firm, such as costs of R&D. Assume that the situation is such that overall cash flow becomes positive once both investments *A* and *B* have been successful. So with a parallel approach, if they are both successful then there is a lower cash requirement thereafter, while if either is unsuccessful then assume that the firm shuts down. The firm's maximum cash requirement for a parallel approach to the two investments is therefore $f + c_a + c_b$.

For a sequential approach, the maximum cash requirement is: $(2 + r)f + (1 + r)c_a - v_{a1} + c_b$. This is the cash requirement at the start of the second time period when the first investment has been successful so that investment *B* is then made. The costs *f* and c_a are both incurred at the outset. The cost of capital is *r*. A further fixed cost, *f*, is then incurred at the start of the second time period, together with the cost of investment *B*. It is assumed here that the investments, if successful, result in positive cash flows that are received at the beginning of subsequent time periods. Specifically, if *A* is successful then the cash flow v_{a1} is received at the start of the second time period. So the additional maximum cash requirement of a sequential approach, over and above that of a parallel one, is then:

$$(1 + r)f + rc_a - v_{a1}$$

This illustrates that a situation involving high fixed costs may require a parallel approach on cash flow grounds, in addition to other possible reasons. Nonetheless, a significant level of financing may be required. Firms facing such conditions often combine the potential for high-growth and high-profits, and so may be well placed to attract equity finance. Formal venture capitalists (Gleason et al., 2006) specialise in backing portfolios of potentially high-growth firms and can also bring important knowledge and network connections. They can therefore reduce both resource constraints and the effects of risk aversion; firm-specific risk being made less relevant by the diversification of investments across portfolios of firms. Partner firms and government can also be significant investors (Gabrielsson et al., 2004).

Conclusion

The Uppsala model is based on the assumption of a maximum tolerable risk level. However, in reality there is also an essential accompanying factor to risk: expected value. The fact that the maximum tolerable risk level aspect of the Uppsala model has persisted for a long time without being given more attention can perhaps be partly explained by the fact that incentives based on risk are often similar to those based on expected value. A sequential (incremental) approach to commitments can both reduce risk and increase expected value by reducing downside risk while still allowing the capture of upside risk. This is achieved through the undertaking of further commitments when learning from earlier commitments leads to the belief that conditions are favourable for them. However, a sequential approach is not always the best choice. The risk-based aspect of Uppsala model is, in fact, compatible with Born Globals where the risk involved in faster internationalisation is low, due to low costs and factors such as relatively homogeneous international preferences and founders' pre-existing network connections. Expected value considerations can work in the opposite direction, however. A firm may then face incentives to internationalise much earlier and to increase its sales relatively quickly across multiple countries. It has been argued above that economies of scale can play a key role. High fixed costs of R&D can mean that the firm will not be profitable, or experience a positive overall cash flow, until it has internationalised. They can lead to a high mark-up of price over marginal production cost, which can

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make additional sales in new markets very rewarding. A more rapid approach to internationalisation may then significantly increase expected value, particularly if the firm faces a small home market. The firm may also need to build its market presence quickly across different markets in order to achieve market pre-emption.

The learning-based advantages of a sequential approach can help to reduce losses through mistaken investments, where the failure of a relatively small initial investment can lead the firm not to undertake a larger subsequent investment. They can also lead the firm to avoid failing to invest in profitable opportunities, where a successful small initial investment causes the firm to invest further where it would not have been willing to make a larger investment at the outset. Learning through sequential investment can also increase expected value where small early investments allow the firm to enhance its resources and capabilities, including forming relevant relationships, such that the returns to subsequent investments are increased and their costs decreased. For the smaller firm, this includes learning how to operate on a larger scale and with added complexity. The firm needs to fundamentally change in nature as it grows from a very small size. It is important to recognise that learning by Born Globals goes beyond gaining knowledge about markets, even where their internationalisation is dominated by market-seeking.

Some firms internationalise early before exhausting home-market growth. The learning effects from further home growth may have little relevance to investments in internationalisation, except in terms of learning how to operate on a larger scale. However, there are other factors that will lead many firms to pursue further home-market expansion before internationalising. These include various factors relating to resource constraints. As is recognised by Born Global literature, these are less relevant to firms that are well financed and that have managers with international experience. In some cases, however, the scope for further home-market growth rapidly recedes where that market is small. Market size should not necessarily be equated with country size, of course. In some cases, even a large country can have a relatively small market where the product in question is highly specialised. A firm may also only have a small niche in a wider market. Additionally, resource constraints are less pronounced for certain forms of internationalisation, such as selling abroad through a website. These may be followed up later on with more resource-intensive investments.

A specialised firm with high recurrent fixed costs of R&D and a limited home market can have incentives to internationalise quickly partly based on its capital constraint. For many firms, insolvency risks would encourage gradual growth and internationalisation. However, large economies of scale can negate such a strategy, as relatively fast growth and internationalisation may then be required to avoid insolvency. Significant growth may be required for the firm to be able to cover its costs of R&D and the home market may be too small to achieve this. The mode of financing is also relevant. Because Born Globals can be potentially high-growth firms, capable of generating high returns if things go well, they can be apt for equity financing. Hands-on venture capitalists can also help to reduce managerial resource constraints. Partner firms may also take equity stakes and be important in easing resource constraints. Risk can be diversified through portfolios held by equity investors, making risk aversion less relevant in relation to each individual firm.

The psychic distance part of the Uppsala model is similarly often still correct when the effects of expected value are explored, but again not always. Sometimes it will make sense to internationalise to a more distant market first if doing so carries a relatively high expected value. This is more likely to happen due to the costs involved having fallen. It may also be demanded by an important customer. Reduced costs of internationalisation have helped to lead to many more Born Global firms (Cavusgil and Knight, 2015). This partly represents an increased specialisation where firms with high costs of R&D can be profitable based on international sales where they would not have been viable

based on home sales alone. It also means that specialised firms within industry clusters will sometimes have a significant international reach where before their impact would have been more focussed within the home cluster.

By more fully recognising the role of expected value, including taking account of the impacts of resource constraints facing smaller firms, the theoretical basis of internationalisation theory is improved and the incremental view is better reconciled with Born Global literature. This article has employed the general approach to internationalisation taken by Casson (1995), representing it in terms of parallel versus sequential investment, in order to address the links between Born Globals and internationalisation theory.

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