

Drivers of Internationalization Levels: Foreign Experience or Firm Specific Knowledge?

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Abstract

This paper compares the major premises of two theoretical frameworks. The first, which is based on the "Uppsala model", attributes drivers of internationalization to foreign experience. The second is based on our interpretation of the OLI Paradigm, developed by John Dunning and his colleagues. It attributes drivers of internationalization to firm specific knowledge. The two frameworks are shown to yield conflicting hypotheses regarding the level of internationalization of firms characterized by accumulation of foreign experience and by different levels of firm specific knowledge. An empirical test conducted on a sample representing a high proportion of Israel's international firms indicates the superior predictive power of firm specific knowledge as a driver of internationalization.

Key words: Internationalization, Internalization, Firm specific knowledge, Foreign experience.

Introduction

Two theoretical frameworks have, in recent decades, come to assume a leading position in that section of International Business literature, which is concerned with the drivers of internationalization: The Uppsala framework which attributes internationalization levels to accumulation of foreign experience and Dunning's OLI Paradigm, which explains Foreign Direct Investment (FDI) in terms of ownership, location and internalization advantages. While not mutually exclusive, the two frameworks imply that internationalization is driven by different factors.

This paper posits that ownership advantage (an OLI factor) rather than foreign experience (an Uppsala factor), is the dominant driver of internationalization levels. The paper develops a model which represents our interpretation of the OLI Paradigm. Viewing internalization of the firm's cross-border value activities as an appropriate measure of internationalization, the model presents internalization and location as the dependent variables, the level of which varies with ownership advantage.

The plan of the paper is as follows: it starts with a literature review of the relevant premises of the Uppsala and OLI frameworks. In the following section we develop the Firm Specific Knowledge (FSK) model, which is based on the OLI paradigm. The model is formulated in a way which makes it possible to empirically test and compare the predictive powers of the two frameworks. Findings of the empirical analysis are discussed in the following section. Implications of the findings are considered in the concluding section.

Literature Review

The Uppsala model views internationalization as an evolutionary process, whereby firms change their level of internationalization as a function of cumulative

experience gained in foreign countries (Johanson & Vahlne, 1977, 1990). The model asserts that internationalization commences at a low level with sporadic exporting, conducted at arms length, by non-specialized units within the firm. Over time, these sporadic activities are replaced by a formally constituted export department. As foreign experience accumulates and the share of foreign sales rises, the firm increases its international resource commitment by transferring production and other value adding activities abroad, thereby increasing its level of internationalization. In parallel, internationalizing firms also increase the number and diversity of countries in which they operate, starting out in countries that are geographically and culturally close to the home country, and gradually diversifying into more distant markets. This perception of increased foreign commitment is rooted in behavioral theories of the firm that emphasize the role of managerial learning. The level of a firm's internationalization is kept initially low as a result of risk aversion. As risk declines over time with the accumulation of foreign experience, the level of internationalization increases (Johanson & Vahlne, 1977, 1990; Welch & Luostarinen, 1988).

Dunning's OLI paradigm (1988, 1993) is essentially based on economic reasoning. It lists three advantages which must occur simultaneously if firms are to engage in FDI: ownership advantages, location advantage and internalization advantage. Ownership advantage is a firm characteristic, location advantage pertains to the relationship between the economic conditions in the home and a particular host country while internalization advantages relates to the modes of capitalizing on the firm's ownership advantage.

Ownership advantage in the OLI Paradigm is achieved by the possession of firm specific assets that give the firm a competitive advantage. Firm specific assets

consist of privileged access to markets or suppliers, as well as firm specific knowledge in the form of proprietary technological, marketing or managerial knowledge. These profit generating assets are resources around which the long term profit earning potential of firms is developed (Barney, 1991) and entry barriers are created (Wernerfelt, 1984). They are characterized by the fact that they are controlled by their owner. Other parties cannot use them without their owner's consent.

Location advantage relates economic characteristics of the home country to specific foreign countries. The concept is similar to Porter's "Factor conditions" (Porter, 1986) as well as "comparative factor abundance" familiar from international trade theory. It refers to the relative costs of producing a given bundle of products in the home and foreign countries.

When location advantage is enjoyed by the home country, the firm locates its production activities in this country, and exploits its ownership advantage by exporting. When the home country suffers from negative location advantage ownership advantage may be exploited by either by FDI or by licensing. In either case firm specific knowledge is transferred abroad. FDI implies that firm specific knowledge is transferred to an organization owned by the firm. When licensing takes place firm specific knowledge is transferred to an independent firm.

The choice between licensing and FDI is affected by internalization advantage, OLI's third variable. When internalization advantage is present FDI is the preferred alternative. When it is absent, the firm exploits its ownership advantage by licensing. Hence, the choice between internationalization modes is determined by the relative magnitudes of the firm's specific knowledge, the foreign country's location advantage and the internalization advantage.

Ownership advantage must be large enough to compensate for Hymer's "Liability of Foreignness" (Hymer, 1976) incurred by firms operating outside their home country. Buckley & Casson (1976), Dunning (1993), Rugman (1981) and others identified the costs associated with the international transfer of firm specific knowledge as a major determinant of internalization advantage. The relationship between the cost of international knowledge transfer and the type of proprietary knowledge was further manifested by Kogut & Zander (1993), Martin & Salomon (2003) and others who showed that knowledge complexity and tacitness are positively correlated with intra-firm transfer of firm specific knowledge. The greater firm specific knowledge, the more tacit and complex such knowledge is expected to be and hence, firms with high levels of firm specific knowledge tend to internalize this ownership advantage by choosing internationalization modes that allow retaining of ownership advantages.

The costs of transferring firm specific knowledge internationally also affect the nature of interaction between internationalizing firms and their customers. Greater levels of firm specific knowledge usually imply greater complexity of the knowledge transferred to end customers (Hirsch, 1989; Almor, Hashai & Hirsch, 2006). Moreover, the transfer costs of such knowledge are expected to rise when cross border transactions are involved, creating a disadvantage for internationalizing firms with a high level of firm specific knowledge compared to their indigenous competitors. This is the result of the longer time duration which is required for international interaction (due to the need of traveling, the impact of different time zones, the relative complexity of transferring knowledge via electronic communication devices etc.) as well as of the need to communicate in different languages, and accommodate different legal and regulatory regimes. Hence, high levels of firm specific knowledge

create economic pressures to locate sales promotion, distribution, training, installation, maintenance and other operations requiring interaction with customers abroad (Hirsch, 1989; Almor et al., 2006).

In the following section we outline a framework we name the Firm Specific Knowledge (FSK) model, which enables us to formulate and empirically test predictions derived from the Uppsala and OLI frameworks.

The FSK model

Our point of departure is the OLI paradigm which, as noted earlier, lists three advantages which must occur simultaneously if firms are to engage in FDI: ownership advantages, location advantage and internalization advantage. The FSK model presented below retains the three types of advantage, while offering its own interpretation of their meaning, as well as of the manner in which they are related, both among themselves, and to the concept of internationalization.

Firm specific knowledge (FSK) constitutes the basis of the firm's competitive advantage. It is generated by investment in R&D and other elements of proprietary information whose purpose it is to enhance the creation and absorption of proprietary, firm specific knowledge which can be withheld from other firms and which creates an ownership advantage (Almor, et al., 2006).

In our model a firm's level of internationalization is represented by two factors: location of the markets for outputs (domestic vs. foreign) and the location and internalization mode of the operations of firms engaged in international business. The higher the ratio of foreign sales to total sales and the higher the level of ownership of foreign value adding activities, the higher the level of internationalization is expected to be.

We posit that ownership advantage is associated with firm specific knowledge (FSK), which, as noted earlier, constitutes the basis for firms' competitive advantage. Ownership advantage has a positive effect on the internationalization of the firm's outputs. *Ceteris paribus*, firms characterized by greater FSK should be able to sell a larger share of their output in foreign markets.

When explaining firms' location and internalization levels, ownership advantage is yet again our explanatory variable. As noted, FSK has two characteristics: it can be denied to competitors and it can be transferred internationally. When considering modes for capitalizing on their ownership advantage firms need to choose (1) whether to locate their operations outside their home countries and (2) whether to internalize these operations, i.e. to transfer their FSK to subsidiaries or to externalize operations by transferring their FSK to independent organizations¹.

The interactions between the three types of advantage determine the location of value adding activities and the extent to which they are internalized. Location advantage determines where production will take place. When location advantage resides abroad, production is likewise located abroad. Ownership of foreign production is determined by internalization advantage, which is, in turn, is expected to be correlated with the level of FSK. Such correlation is expected since the higher the level of FSK, the greater the probability of internalizing foreign production activities, thus capitalizing on the superior efficiency of intra-firm knowledge transfer (Buckley & Casson, 1976; Kogut & Zander, 1993; Martin & Salomon, 2003). Similar reasoning implies a positive correlation between the levels of FSK and internalization

¹ Note, however, that foreign operations can take place only if the firm's ownership advantage is large enough to compensate it for Hymer's Liability of Foreignness (Hymer, 1976).

of foreign R&D and foreign downstream activities². Hence, we hypothesize that internalization and FSK are positively correlated, i.e. the higher the level of FSK the higher the level of internalization of foreign operations.

We further expect to find a correlation between the level of FSK and the share of foreign R&D and downstream activities. The higher a firm's FSK, the larger the share of technological knowledge assets out of total output and hence the more likely are firms to seek complementary foreign knowledge assets in foreign centers of excellence (Cantwell, 1995). Thus, we expect that the higher the level of FSK, the higher the probability of R&D activities to be located abroad. Furthermore, the higher a firm's specific knowledge the higher its frequency of interacting with foreign customers and hence the higher this firm's expected tendency to locate its downstream activities abroad (Almor et al., 2006) in order to increase the efficiency of interaction with customers. Thus, while there is no compelling reason to assume any correlation between the share of foreign production activities of firms and their level of FSK, we do expect to find that the higher the level of FSK the higher the share of a firm's foreign operations out of its total operations.

It follows that predictions suggested by the FSK and Uppsala models concerning the determinants of internationalization levels differ. The Uppsala model predicts a positive correlation between foreign experience and internationalization levels and a zero correlation between firm specific knowledge and internationalization levels. The FSK model offers different expectations. It predicts a positive correlation between firm specific knowledge and the level of internationalization and zero correlation between foreign experience and the level of internationalization.

² We refer to downstream activities as to all activities in which interaction with end customers is required including: sales promotion, distribution, training, installation and maintenance.

The conflicting expectations suggested by the two models are shown in Table 1 which summarizes the relationships between level of internationalization, FSK and foreign experience (FE) as predicted by the two models.

Table 1 – Level of Internationalization, Foreign Experience (FE) and Firm Specific Knowledge (FSK)

	<i>Low FE</i>	<i>High FE</i>
<i>Low FSK</i>	(1) Low level of internationalization (according to both models)	(2) Uppsala model– high level of internationalization FSK model- low level of internationalization
<i>High FSK</i>	(3) Uppsala model – Low level of internationalization FSK model - high level of internationalization	(4) High level of internationalization (according to both models)

Levels of FE are shown on the horizontal axis and of FSK on the vertical axis. We distinguish between four groups of firms classified on the basis of their levels of FSK and FE:

Group 1 contains firms characterized by low FSK and low FE

Group 2 contains firms characterized by low FSK and high FE

Group 3 contains firms characterized by high FSK and low FE

Group 4 contains firms characterized by high FSK and high FE

Both models predict that firms in group 4 have a higher internationalization level than firms in group 1. Predictions regarding the internationalization levels of firms in group 2 and 3 differ, however. The Uppsala model predicts that firms in group 2 (low FSK and high FE) will have a higher internationalization level than firms in group 3 (high FSK and Low FE). The FSK model predicts the opposite.

Data and Methods

The predictions of the two models were empirically tested on data obtained from Israel's largest industrial firms. The original list included Israel's one hundred and fifty largest industrial firms, whose international sales reached at least 25% of their total sales. Combined foreign sales of these 150 firms represented about 80 percent of Israel's industrial exports in 1999. The list was based on data received from Israel's Ministry of Industry and Trade and data provided by Dun & Bradstreet (2000). After eliminating foreign affiliates and firms with insufficient data, a sample of 101 firms remained.

The final sample consisted of 75 firms which provided useable information. Comparisons between the 75 participating firms and the 26 non-participating firms did not show evidence of any response bias in terms of firm sales, number of employees, year of establishment, industrial classification and percentage of foreign sales. The firms belonged to the following industries: electronics, software, telecoms, pharmaceuticals and biotechnology, chemicals, food & drink, metal & steel, rubber, plastics, wood, paper, textiles and apparel industries. In this paper we use the data relevant for the year 1999.

Export experience was used as a proxy for FE. The ratio of R&D expenses to sales was used as a proxy for the level of FSK. We divided the firms in the sample into "low FE" and "high FE" firms as well as into "low FSK" and "high FSK" firms. The grouping was based on the median length of export experience (11 years) and median level of FSK (0.06). Firms' level of internalization is proxied by the familiar Transnationality Index (TNI), employed by the United Nations (UNCTAD, 2005) which is the simple average of three ratios: foreign sales to total sales, foreign assets to total assets and foreign employment to the total employment. The share of value

added originating abroad would be a superior measure of internationalization. In view of the fact few firms have information on the geographic distribution of their value added we concluded that the TNI index is a reasonable substitute.

Results

Table 2 shows the average TNI indices calculated for the different groups.

Table 2 – Level of internationalization, Foreign Experience and Firm Specific Knowledge – empirical findings

	<i>Low FE</i>	<i>High FE</i>	<i>Average</i>
<i>Low FSK</i>	(1) TNI Index =0.17 N=10	(2) TNI Index =0.38 N=27	TNI Index =0.32 N=37
<i>High FSK</i>	(3) TNI Index =0.85 N=27	(4) TNI Index =0.81 N=11	TNI Index =0.84 N=38
<i>Average</i>	TNI Index =0.66 N=37	TNI Index =0.50 N=38	TNI Index =0.58 N=75

Firms with high levels of FSK are clearly more internationalized than those with low FSK levels ($T=3.501$, $p<.001$) showing support for the predictions of the FSK model. The differences in the TNI index between firms with low FE and high FE are insignificant ($T=0.938$, $p<.35$), in contrast to the expectations derived from the Uppsala model. In addition, the difference in the TNI index between firms with high and low FE is significant only for firms with low FSK levels ($T=1.968$, $p<0.1$) albeit only at the 10% significance level, indicating that foreign experience appears to increase the internationalization level of firms with low FSK levels but not of those

with high FSK levels. Furthermore, group (2) firms are significantly less internationalized than group (3) firms ($T=2.433$, $p<.05$), thus providing initial support for the superior explanatory power of the FSK model compared to the Uppsala model.

Next, we test the impact of FSK and FE on the firms' levels of internationalization by means of Ordinary Least Squares (OLS) regressions. The three components composing the TNI index and the full index were chosen as our dependent variables. The level of FSK and FE were our independent variables. We controlled for possible effects of firm size (measured as sales volumes in millions of US dollars) and industry affiliation and added interaction effects between FSK, FE and firm size.

Table 3 details the standardized coefficients of the explanatory variables and the significance of these coefficients for the different dependent variables. Table 3 shows that the models used have reasonable adjusted R squared values and significant values of the F statistic (ANOVA). Multicollinearity in the regression analyses is excluded since the maximal Variance Inflation Factors (VIF) reported are sufficiently small. Heteroskedasticity is excluded since the plots of the residuals against the dependent variables show a random distribution of the residuals. This was further verified by running regressions of the residuals against the dependent variables. As expected, the regression coefficients turned out to be insignificant, indicating that the residuals did not contribute to the dependent variables.

Overall, Table 3 shows a consistent and significant positive correlation between the level of FSK and the level of internationalization, thus supporting the proposed FSK model. Foreign experience, on the other hand, shows inconsistent results, as its coefficients are negative for the TNI index and the share of foreign

Table 3 - OLS Estimations of internationalization level
(1999 data, standardized coefficients)

	TNI index and its components			
	Share of foreign assets	Share of foreign employees	Share of foreign sales	TNI index
FSK level	.407***	.417***	.200**	.514***
Foreign Experience	-.025*	-.029*	.024*	.033*
Sales	.166*	.059*	.046*	.033*
Food & Beverage	-.192	-.158	.013*	-.173
Metal	.055	.031*	-.003**	.070
Rubber, Plastic, Wood & Paper	-.062	.029*	.020*	.041*
Textile & Clothing	.078	.141	.186	.118
Computer hardware	-.137	-.090	-.045*	-.148
Software	.072	.063	.122	.122
Telecommunication	.004**	-.062	-.039*	-.103
Pharmaceuticals	-.106	.025*	-.163	-.037*
Other	.059	.046*	-.140	.009*
FSK * Sales	.208	-.026*	.415***	-.003**
Foreign Experience * Sales	.037*	.030*	.046*	.024*
FSK * Foreign Experience	-.022*	-.014*	.142	-.080
Adjusted R-square	0.15	0.16	0.16	0.25
F-statistic	14.53***	15.34***	15.18***	26.21***
N	75	75	75	75
Max VIF	1.63	1.61	1.56	1.61

*** - Significant at $p < 0.001$; ** - Significant at $p < 0.01$; * - Significant at $p < 0.05$.

VIF= Variance Inflation Factor. Reference industry = chemicals.

employees and foreign assets, but positive for the share of foreign sales. These findings do not lend support to the predictions of the Uppsala model. Taken together these results show that FSK is a stronger driver of internationalization than FE. In addition to the level of FSK and FE, firm size is also significantly positively related to the level of internationalization, indicating that in Israel, and possibly elsewhere, large firms are more internationalized than small firms.

Some of the industry controls are also significant, reflecting inter-industry variance in levels of internationalization. As for the interaction terms, the interaction of FSK and size has a negative correlation with most dependent variables, but a strong and positive moderation effect on the percentage of foreign sales. This result might imply that the complexity of internalizing foreign operations for large firms is more pronounced at high levels of firm specific knowledge, due to the increased costs of transferring such knowledge within the organization. FE positively moderates the effect of firm size on the TNI index and the share of foreign sales. On the other hand, FE negatively moderates the main effect of FSK on the share of foreign assets and employees, indicating that in our sample more experienced firms with high levels of FSK internationalize their operations less than firms with lesser foreign experience. This result might suggest that foreign experience may enable high knowledge intensive firms to externalize at least some of their operations, since foreign experience increases the ability to transfer knowledge to foreign partners more efficiently. In order to further establish the robustness of our results, we also ran the regressions on 1995 data that we had for the firms in our sample. In all cases results were robust.

Discussion

The FSK model proposed in this paper advances internationalization theory in several respects. The model expands the scope of the OLI paradigm to predict firms' level of internationalization by offering a framework which specifies the relationships between the three types of advantages on which the paradigm is based. Ownership, location and internalization advantages are presented as continuous variables that are functionally related. The rationale of the model is that ownership advantage is based on firm specific knowledge which serves as a catalyst for successful competition in foreign markets in an internalized manner.

While being withheld from competitors, firm specific knowledge can be more efficiently transferred to foreign based subsidiaries or branches, where it is employed to develop, produce and deliver competitive goods and services. Firms characterized by high levels of firm specific knowledge, prefer internalization of foreign production, R&D and downstream activities to licensing and other externalized relationships due to the need to economize on intra-firm interactions costs, enhance their technological knowledge base and improve the efficiency of interactions with customers.

The formulation of the FSK model presented in this paper makes it possible to empirically test hypotheses derived from the seemingly unrelated OLI and the Uppsala frameworks. The first, which attributes internationalization to firm specific knowledge, is shown to have superior predictive power over that of the second, which attributes internationalization levels to foreign experience. Moreover, we show that the predictions of the Uppsala model hold mainly for the internationalization of outputs, but not for that of foreign operations. We show that the impact of foreign

experience holds for firms with low firm specific knowledge, hence confining the prediction scope of the Uppsala model.

Given the main effects identified in this paper, the complex interaction effects observed and the fact that our empirical tests relate to a relatively small sample of internationalizing firms from a single country, additional evidence is needed on the interrelationship of firm specific knowledge and foreign experience as drivers of internationalization, before these findings can be regarded as conclusive.

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