Legal environments and location choices by Hi-Tech start-ups

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In the field of strategic management research, studies devoted to international entrepreneurship reflect a developing area that is experiencing strong growth (Bollinger, Hope and Utterback, 1983; Storey and Tether, 1998; McDougall and Oviatt, 2000; Hitt, Ireland, Camp and Sexton, 2001). This emerging interest corresponds to the arrival in the course of the past fifteen years of high-technology start-ups which integrate international operations into their development from the first years of their existence (Oviatt and McDougall, 1995; Murray, 1997). This expansion beyond national boundaries corresponds in the first instance to the constraints of the market: these companies, highly specialized in technological innovation, must often reach out to the few potential customers in foreign countries eager to exploit their product. But these start-ups also have strong incentives to develop in a way that enables them to gain access to prospective sources of innovation and to maintain their competitive position (Shrader, 2001).

The advantages of internationalization can only be achieved, however, by assuming a certain number of additional costs -- infrastructure costs, but also informational costs barely visible at a superficial level (Root, 1997; Coeurderoy, 1996). The latter costs have been most clearly demonstrated in the studies on the choice of organizational structure in the internationalization process (Buckley and Casson, 1976; Johanson and Valhne, 1997, 1990). Such information costs tend to decline substantially with the accumulation of international experience. Many studies have therefore focused on the initial entry choices because they represent a critical learning phase (Anderson, 2000; Autio, Sapienza and Almeida, 2000; Lu and Beamish, 2001).

The present study follows this line of research. The purpose is to analyze the extent to which the choice of the initial start-up measures represents a strategy for dealing with this learning curve. More specifically, we employ as a working hypothesis the proposition that high-technology start-ups can be expected to prefer to initiate their internationalization by penetrating countries whose institutional environment is close to that of the home country of the start-up. An empirical test is conducted based upon a representative sample of high-technology start-ups in the United Kingdom and Germany. The first part presents the theoretical aspects; the second part, the research

methodology; the third part, the empirical models and results; and the last part, elements for discussion.

Internationalization of Start-Ups and Institutional Environments

The implementation of a development strategy abroad represents a major strategic choice for a company (Root, 1997). Although the anticipated advantages in terms of markets constitute a strong attraction, these must be evaluated on the basis of the additional costs which such a decision entails. The costs in question can be broken down into physical costs and informational costs.

Entry into foreign markets can involve various types of productive costs. These can be for physical investments (communications facilities, translation costs, representation expenses, etc.); for human investments (travel and subsistence costs, remuneration of local staff). Such investments are directly correlated to the firm's strategy of growth and to the expansion of its resources (Penrose, 1950). It is therefore not surprising to observe that the size of the firm, viewed as a reflection of the firm's growth, is very intimately linked to the probability of the firm engaging in export activity (Bricout, 1991); Bonarcosi, 1992; Calof, 1994). It would be rash to conclude, however, that the size of the company, although correlated with its internationalization activity, in itself serves to fully explain it. For a fuller explanation, it is necessary to consider the geographic differences between the countries: for a company established in a country such as Belgium, for example, the issue of internationalization can be expected to be raised early on, without that requiring major logistic expenditures; on the other hand, in a country such as China or the United States, many companies must assume costly infrastructure costs in order to extend their activity throughout the country. Many examples could be cited to point out the limits of a purely technological approach to internationalization.

In fact, it is certainly more relevant to view internationalization not so much as a spatial phenomenon as an institutional one. For a firm to internationalize its activities means that it must in effect leave a given socio-economic space in order to adapt to different "rules of the game" (North, 1990). Davis and North (1971, p. 6-7) define the institutional environment concept in these terms:

"the set of fundamental political, social and legal ground rules that establishes the basis for production, exchange and distribution".

Entering into a new institutional environment therefore involves a certain number of transaction costs (Williamson, 1985; Teece, 1986): a different environment entails assuming search costs (finding local agents and verifying their qualifications); costs of *ex ante* negotiation (drafting and conclusion of contracts governing implementation of the mutual arrangements); and *ex post* negotiation of costs (institution of implementation follow-up and of conflict resolution procedures). The uncertainty generated by the host country thus exerts a leverage effect, increasing the transaction costs, which the firm, with its set institutional environment, must assume in order to develop its activity. Numerous studies have explained that the greater a source of uncertainty, the institutional environment of the receiving country constitutes, the higher the transaction costs for the originating firm (Teece, 1986; Gomes-Casseres, 1989; Oxley, 1999).

This institutional uncertainty for the firm can take two forms. In absolute terms, a new institutional environment can generate uncertainty when the public decision-makers fail to create the conditions for political and social stability propitious to the development of business (Shrader, Oviatt, McDougall, 2000). There is also a long line of research on the measurement of "political risk" and on its effects. In relative terms, a new institutional environment, even without risk, can produce uncertainty for a firm, depending upon the nature of its initial environment. The greater the gap between the two, the greater the uncertainty. The gap is analyzed in terms of concepts such as cultural distance (Hofstede, 1980; Kogut and Singh, 1988; Shane, 1994) or regulatory differences (Reynolds et al., 2001).

To analyze the entry of a firm in a new country, it is customary, in principle, to break down the costs of internationalization into three elements (Kogut and Zander, 1993):

- First, the cost of acquisition of the knowledge and experience specific to a country;
- Second, the cost of acquisition of the knowledge and experience necessary for the development of a specific activity, whatever the country in question;
- Third, the cost of acquisition of the knowledge needed to develop a specific activity in a particular country.

The first two costs take the form primarily of sunk costs: the knowledge and experience acquired for a country represent investments which cannot be redeployed to another country; the knowledge and experience acquired to develop an activity cannot be reused for other activities. On the other hand, the accumulation of such knowledge and experience does make it possible to generate a cumulative experience effect: the knowledge and experience gained in one country will substantially facilitate the initiation and development of a second activity. Similarly, the introduction of the same activity in a second country will benefit from the experience gained in the previous country. It can therefore be considered that the average cost for the firm of an nth internationalization follows the form of an experience curve (Graph 1)[i].

< insert graph 1 >

The image of the curve presented in Graph 1 clearly indicates the crucial importance of the initial foreign market entries, since it is at that point that the average costs are highest and that the slope of the curve is the steepest. By way of illustration, reading of the graph shows that at the fifth market entry the average cost of internationalization is half of that for the first market entry. The curve also shows that a firm which embarks upon a process of internationalization has an interest in developing a strategy that enables it to negotiate its experience curve on the most favorable terms.

In view of the nature of the experience curve as we have described it, mainly two development options are presented at the start of internationalization:

- Expand an activity involving a product or a service from one country to another;
- Introduce different activities in the same country.

In the case that interests us, however, i.e. high-technology start-ups, the companies involved are primarily those specialized in innovation. Such start-ups hardly fall within the second case set forth[ii]. It can thus be considered, from a theoretical standpoint, that in the process of internationalization of this type of company, cost (2) takes the form of an entrance ticket (a positive cost at the time of the first market entry, then a free pass for the subsequent foreign market entries)[iii]. Accordingly, management of the learning curve will primarily involve acting on cost (1).

This means that it can be expected that the market entry choices will incorporate, in some measure, the aim of minimization of learning costs. Following the approach developed by Williamson (1999), the firms can be expected to opt for a strategy that will enable them to minimize their transaction costs. Since costs (2) and (3) have a constant value, we are left with the conclusion that cost (1) is the only one on which the firm can exert efforts to minimize costs. In this respect, the location choice for the first market entry can be expected to focus on the search for a country whose "institutional distance" from the country of origin is small, so that the learning costs are minimized in this regard.

Whence our first hypothesis:

H1: High-technology start-ups have a greater chance of initiating their internationalization by selecting a country that is close to them from an institutional standpoint.

On the other hand, the firm which accumulates international experience with each new market entry lowers the learning curve but the marginal gain of the n+1st market entry is a declining one (at constant technological level). The transactional cost differential which vindicated the first market entry thus tends therefore to disappear in relative terms. In this regard, the firm will have less

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[i] It is considered, however, that the third element is by its nature independent of any experience and therefore can, for simplification be stated as a constant value.

[ii] The second option related instead to cases such as those of "traditional" SMEs already exploiting a diversified range at the national level and seeking new outlets (Lu and Beamish, 2001)

[iii] This hypothesis is especially credible since, as we shall see later, the first international operations are effected in a particularly brief lapse of time -- and since the internationalized activity therefore has little chance of evolving techologically in any significant way.

difficulty in penetrating institutional environments further removed from that of the firm's country of origin.

Whence our second hypothesis:

H2: The greater the increase in the number of foreign market entries, the greater chance high-technology start-ups have to penetrate different institutional environments.

Since such location choices are influenced by the institutional gap that separates country of origin from host country, it can be expected that the institutional characteristics of the receiving country are capable of affecting the direction of the start-up's strategic development path. Certain national institutional environments are strongly idiosyncratic, however, while others present great similarities. Accordingly, if we examine the distinction in legal systems drawn by La Porta et al. (1999) covering 212 countries, 34.43% of them follow the English legal tradition; 43.39%, the French legal system; 3.30%, the Germanic legal tradition; and 2.36% the Scandinavian legal tradition, with the remaining 16.51% being represented by a Socialist legal system. It can therefore be expected that start-ups whose country of origin is one whose legal tradition that is not broadly disseminated will have a greater inclination to penetrate other institutional environments rapidly and a greater aptness in doing so.

Whence our third hypothesis:

H3: The more high-technology start-ups originate in countries whose institutional principles are widely disseminated abroad, the later such companies will tend to enter other institutional environments.

Methodology

Before testing our hypotheses, we used a database dedicated to the internationalization of British and German high-technology start-ups. The database was constructed from the end of 1997 until the start of 1998 on the basis of a questionnaire sent to selected companies in each country and constitutes a representative sample, even if the rate of response is higher in the United Kingdom (24%) than in Germany (14%) (Burgel, Fier, Licht and Murray, 2001)[iv].

These two countries are substantially comparable in socio-demographic and economic terms and are among today's major economic powers. From an institutional standpoint, however, they fall within two different historic fields. For the present research, two factors merit special consideration:

- First, these two countries are historically at the heart of two separate legal systems. The United Kingdom has built a legal tradition on the system of the "Common Law" whose foundations go back to the 13th century (Glaeser and Schleifer, 2001) and which has been built in great part through case law precedents. On the other hand, Germany has developed a different body of law based on a Roman law tradition (La Porta et al., 1998) in which the legislature plays a predominant role. Even if these two countries are close geographically speaking, all national economic activities are governed by legal frameworks which have developed from different historical traditions. Start-ups can be expected to be extremely sensitive to their national environment to the extent that the conditions for the formation of a company and the first years of development come under the rules of municipal (national) law.
- Second, over the past two centuries, these two countries have known very different expansionist histories. The United Kingdom developed a strong colonial presence in the world, reaching its high point in the period between the two world wars. This presence resulted in the substitution of English law in many countries (India, Pakistan, Malaysia, Kenya and others) or in the direct implantation of English law in areas such as the United States of America, Canada, Australia and New Zealand. On the other hand, in Germany, expansionist policy was much more limited, especially after Germany's defeat

[iv] All procedures followed to develop a representative sample are presented in the study cited here. The details can also be provided by the authors.

in World War I. That explains in large part the small number of countries with a Germanic law tradition.

The other major question is that of defining (1) a start-up and (2) high-technology (Storey and Tether, 1998). On these two points, the designers of the database adopted the following criteria:

1. A start-up is a legally independent company formed within ten years preceding the survey, i.e. in the 1987-1997 period. The time criterion here is broader than in other studies. Zahra, Ireland and Hitt (2000), for example, establish the threshold at six years maximum; Shrader (2001), five years; but Storey and Tether (1998), as well as Autio, Sapienza and Almeida (2000) free themselves of the age criterion to study the emergence of high-technology firms in Europe and the international growth of Finnish entrepreneurial firms. Our aim, however, is to find a fair balance between research objectives and definition of the empirical field. Given the size of the country, it is possible to construct a substantial sample in the United States with strict age criteria, whereas the population is seriously reduced, comparatively speaking, in the European countries (in the statistical field, Europe still being a collection of countries, rarely offers a harmonized image, not to speak of uniformization).
2. To define the high-technology sector, the database designers adopted the definition proposed by Butchart (1987), i.e. "the sectors whose R&D expenses expressed as a percentage of sales exceeds the average or the sectors which employ more 'scientists and graduate engineers' than other sectors". Because of the slenderness of the borders between productive and service sectors in the field of high technology, sectors classified as service sectors have been added. In all, the sectors selected cover the following recognized industries: software; information technology and telecommunications equipment; engineering; life sciences and medical sciences; and miscellaneous (Table 1).

These methodological choices have made it possible to identify a population of 2671 start-ups in the United Kingdom and 5045 companies in Germany, on the basis of which it has been possible to compose a sample of 362 firms in the United Kingdom and of 232 companies in Germany. Since certain companies had not yet begun their internationalization process, we were left with 241 firms in England and 134 in Germany. On the other hand, in the present study, our level of analysis is not the firm as such, but the firm's decision to develop its activities beyond the country of origin. The respondent can indicate a maximum of the first five foreign market entries for the company,

providing the identity of the country concerned and the date of entry. This approach makes it possible to arrive at a sample comprised of 945 foreign market entries by the British companies and of 450 foreign market entries by the German companies, for a total of 1395 observations.

The Dependent Variable -- The Legal System of the host Country

In this study, we endeavor to ascertain the extent to which the institutional proximity between countries is a factor which determines the path of internationalization of high-technology start-ups in their initial phase. Here, we elect to utilize the institutional environment approach through the concept of the legal system as described by La Porta et al. (1997, 1998, 1999). In this series of articles, the authors showed the extent to which the legal systems of 212 countries can be traced back to five basic legal systems from a commercial law standpoint: the English, French, German, Scandinavian and Socialist legal systems. It is a purely formal institutional environment approach in that it relies on the rules of written law. It is therefore partial in certain respects, since the more informal aspects set forth in the Davis and North definition are absent. On the other hand, this legal classification matches the conclusions of other legal studies and ensures a certain extrinsic validity. Similarly, it could be considered as relatively rudimentary to reduce the diversity of institutional environments to a variable comprising five categories. Conversely, it can be considered that, if one is to produce significant results from such a rudimentary (but relevant) variable, these results are all the more sound.

According to the hypothesis, we shall therefore use as a dependent variable:

- Either a qualitative variable with five components indicating the legal system of the target country;
- Or a binary variable, derived from the previous variable, indicating whether the company enters the market in a country with a legal system whose origin is different (coded "1") or continues to operate in a country whose legal system remains that of the country of origin (coded "0").

The Explanatory Variables

The first variable selected indicates the country of origin of the start-up which initiates entry in a foreign market. It represents, as does the dependent variable, an approximation of the institutional environment of the country of origin of the start-up, i.e. either an English legal system or a Germanic legal system. It is also by comparison of this variable with the dependent variable with five components that the dependent binary variable is formulated. The reference nationality is the nationality of the country of origin. The coefficient of the GERMAN variable indicates therefore the differential of the German companies vis-à-vis their British counterparts.

A second variable shows the rank of each market entry noted for the responding start-up (MARKET ENTRY). This variable can be assigned one of five values: "1" for an initial market entry up to "5" for a fifth market entry. A order of entry is thus established, for information, for each firm. It does not therefore carry information on the orders of entry in one country, nor, by the same token, on strategic behaviors in terms of search for an advantage for the initial entry (Chang and Rozensweig, 2001). This variable makes it possible to approach the internationalization learning process through the cumulation of market entries. The reference mode selected is the first market entry. In view of the codification of the explanatory variables, a positive coefficient generally indicates a greater inclination to emerge from the environment of the country of origin.

A third variable (YEAR) indicates the year in which the entry is effected (between 1987 and 1997). This makes it possible to control any cyclical economic effects which, for a given period, can make certain regions more attractive areas for development than others.

A fourth variable (RISK) presents a measure of "political risk" such as that incurred by the international rating agencies of the countries for the benefit of investors. It indicates the extent to which the governments in place generate uncertainty for the economic decision-makers on the future enhanced value of potential investments. Here we use the notation employed by the agency "Institutional Investor". Taking account of this variable in our analysis makes it possible to incorporate these effects of national policy on the path of internationalization, whatever the country of origin of the start-up.

A fifth variable (GDP) provides an approximation of the size of the market in the country of origin, through Gross Domestic Product expressed in billions of US dollars (calculated logarithmically). This variable provides an image of the attractiveness of the receiving country in terms of potential for growth of turnover. It would have been possible to select a criterion that indicates not the size of the economy as a whole but the industry represented by the entering firm (for example, the software industry). In addition to the purely statistical problems involving missing data, however, such a measure provides an assessment of the dynamism of the companies established in the receiving country rather than of sales potentials, since the consumers/users of what such start-ups have to offer can be spread over many economic sectors.

A sixth category variable (SOFTWARE, INFORMATION TECHNOLOGY & TELECOMMUNICATIONS EQUIPMENT, ENGINEERING, LIFE & MEDICAL SCIENCES, MISCELLANEOUS) indicates the five sectors to which the firms entering foreign markets can belong, according to the classification shown in Table 1. By incorporating these sectoral elements, it is possible to determine whether the selection of location is influenced by specific sectoral dynamics.

< insert table 1 >

Lastly, a seventh and last variable (EU) is introduced into the model in order to take account of the existence of the European Union which both the United Kingdom and Germany are members of, as are thirteen other countries.

Empirical Analysis

Descriptive Approach

Before testing our model and verifying our theoretical hypotheses, an initial descriptive approach provides interesting preliminary elements for analysis.

Table 2 presents the breakdown of the data between the country of origin of the high-technology start-ups (England or Germany) and the legal system of the host country. A chi-square test shows

that the zero hypothesis ("there is a homogeneous distribution of the cases within the units") is rejected at the 1% threshold.

< insert table 2 >

The analysis of the case distribution seems to confirm our expectations. The percentage of operations conducted by the British firms in an English legal environment is substantially greater than that of the German firms (33% versus 18%). Conversely, the percentage of operations conducted by the German firms in a German legal environment is substantially greater than that of the British firms (29% versus 19%). On the other hand, in the case of the market entries in Scandinavian and French environments, the percentages are close to one another, i.e. around 10% and 35%, respectively. While the institutional environment is different for both the British and the German firms, we find a homogeneous distribution of the entries into foreign markets. The case of entries into Socialist markets represents a separate case: over the period of our study, the majority of such countries entered into a transition phase through a rather abrupt and avowed renunciation of the Socialist model which had gained ground in the course of the twentieth century. The difficulty of this transition, moreover, means that it is still difficult to identify a new form of legal system (or to return to a legal tradition that predates the Socialist era) and, *a fortiori*, even more difficult to put a date on when it will be possible to do so. In addition, the fact that starting at the end of 1989, the former-FRG undertook the absorption of the former-GDR also contributes to creating a historical institutional closeness between Germany as a whole and the countries still classed as Socialist. All these factors taken together make it possible to understand the greater proportion of entries into Socialist markets by German firms than by British firms.

Table 3 presents the same data, but only for the first market entry, i.e. when the start-ups have yet to build up a store of experience in the internationalization process. As expected, the observations made on all the data are borne out even more strongly when it is the first operation that is under examination. The only qualification is that the presence of British firms in the Scandinavian environment is greater whereas the German firms are proportionately more present in the French environment. It must be noted, however, that the Scandinavian environment is that which is closest to the British environment. The French environment, on the other hand, has no privileged link with the German environment. Even so, of the fifteen countries of the European Union, eight out of the possible fourteen have links to the French environment. Here too, however, for historical reasons,

Germany has for fifty years espoused a voluntarist policy of European economic integration (from the CECA European Coal and Steel Community Treaty until the current monetary union, including an extensive period during which Germany was a net contributor to the European budget). That translates into figures with a particularly significant weight for Germany in intra-Community trade.

< insert table 3 >

Statistical Analysis

In order to test the hypotheses we have formulated, we run here a complete model, i.e. including all the variables previously presented. Successively, we shall pursue the following two stages:

◊ First, we analyze the factors which influence the firms to enter into an international environment different from that of the country of origin. We use a binary variable here (Staying in the same legal environment: "0"; Confronting a new legal environment: "1") and a logistic regression model. This is tested on all the entries into foreign markets (Model 1). The coefficient linked to the GERMAN variable indicates the differential if the entry is operated by a German company (the default being entry by a British firm). The following two regressions make it possible to compare the behavior of the British (2) and German (3) companies. These regressions allow us in particular to verify hypotheses 1 and 2.

◊ Second, we return to the analysis with the variable with five elements on the legal environments (Table 5). We use a multivariate logistics model for this purpose. This enables us to compare the choices of localization in the form of alternatives. Here, we remove the variable on the rank of entry in order to simplify the analysis. This model makes it possible to analyze the relevance of hypothesis 3. In this model, we remove the EU variable since, as today there is no European Union country with a Socialist legal system, this situation poses an evaluation problem.

Analysis of the results of the logistic regressions makes it possible to provide a response to the first hypothesis (table 4). All inputs taken together (Regression 1), the coefficients are all positive, indicating a higher probability of entering a different institutional space compared to the initial entry. On the other hand, this coefficient is truly significant only as from the third entry. It appears that it is not so much on the first entry, but rather on the first two entries into foreign markets, that firms accumulate sufficient experience to assume the cost of entry into a different environment.

This phenomenon applies equally to German firms and to British firms (GERMAN non-significant) and confirms that the "cost of emerging" from one institutional environment to another is relative and not absolute: there is nothing intrinsic in either of the two environments which would make it more difficult to emerge. The analysis by British cases (2) and German cases (3) does show certain significant differences, however. Primarily, it seems that the order of entry is less significant for the German companies than for the British companies[v].

< insert table 4 >

Similarly, we obtain confirmation of hypothesis 2. As stated above, it seems that there is a threshold effect after the second entry and not the first. The probability increases up to the fourth entry and then declines for the fifth. This can indicate that after the fourth entry, the firm has assimilated the effects of institutional diversity into its international management experience.

The multinomial model makes it possible to verify hypothesis 3 more accurately than with the logistic model (Table 5). The first conclusions drawn from the single descriptive analysis are confirmed: the firms based in Germany demonstrate a greater inclination to break out of their institutional environment than the British firms. This is seen on a reading of the coefficients of the GERMAN variable.

< insert table 5 >

Discussion

Examining the Results

The empirical results of the tests proceed therefore in the direction of the hypotheses formulated in the first part of the study. They show that high-technology start-ups take into account the institutional characteristics of the host countries in their choice of location. This is seen in our sample, whether the firms are British or German. On the other hand, we note a difference in behavior between the British firms and the German firms. After the very first entries (the first two

[v] It is pointed out, however, that, in tests using not a raw sample but a sample weighted based on the actual population, the coefficents appear much more significant for the German companies.

here), the German firms penetrate a greater diversity of institutional environments than the British firms. In fact, there is in large measure a constraint on growth, at least for the German firms which have an "institutional space" that is much more narrow than that of their British counterparts. This situation tends to generate a higher learning cost for German firms, but the experience gained is expected to be richer. It would be interesting to see the extent to which this different path influences the results of these companies over the long term. The work conducted by Burgel, Fier, Licht and Murray (2001) on the same database has indicated, moreover, more moderate international growth by the German than by the British firms. It would be premature to draw the conclusion that the reason stems from the institutional difference; it is possible, however, to note the combination of factors and to interpret that as an indicium in favor of our thesis.

This "institutional distance" effect that we are describing here is in addition to the other factors traditionally mentioned in the study of internationalization. The political risk, in particular, exerts an especially significant influence on the two dependent variables tested. In fact, whatever the institutional environment, the start-ups remain particularly sensitive to this factor. Nevertheless, these two elements -- the definition of the "rules of the game" and the uncertainty concerning governmental policy matters -- remain relatively independent[vi]. The same observation can be made as regards the variables on the size of the country of entry (GDP) and geographic proximity (EU). Here too, it is not a question of alternatives but of complementarity. It is possible, moreover, to advance the hypothesis that the firms would be inclined, consciously or not, to initiate their internationalization in a two-stage decisional process in the following form:

1. Choice of institutional space (same origin or not);
2. Choice of receiving country on the basis of the prevailing economic and political conditions.

To pursue the point further, it would be necessary to test a more complete polynomial model, making it possible to incorporate this aspect of stages. Similar approaches have already been developed on entry models for multinational firms on the basis of:

1. Entering solely or in partnership and

[vi] It is significant, moreover, that in the statistical models tested, the quality of evaluation of these two variables is better when they are present together and that the residuum is thus reduced.

2. The share to be granted in the cooperative effort to the prospective partner (Gatignon and Anderson, 1988).

To our knowledge, the approach that we are proposing on entry costs generated by the institutional environments, and the strategies of localization in managing the learning curve, is new. It supports other work which has studied the impact of the environment on the process of internationalization of firms through more competitive notions specific to the firm (Hymer, 1972); more competitive behavior by the nations (Porter, 1990); notions of political risk (Reeb, Kwok and Baek, 1998) and of cultural difference (Hofstede, 1980; Shane, 1994). In our opinion, the high-technology start-up, in its initial internationalization process, is especially sensitive to the parameters related to the institutional environment for at least two reasons:

◊ On the one hand, being at the start of a learning process, it does not yet have the internal capability that enables it to deal effectively with the increase in uncertainty and in environmental complexity which internationalization generates. Whatever its potential in more competitive terms, it may prefer an "interpretable" market, for its "house rules", to a market with stronger sales potential but rules difficult to understand. Of course, the two factors can come together and that surely explains why the British entrepreneurs have a stronger inclination than the German entrepreneurs to launch the US phase of their internationalization campaign. Even in that case, however, it would be interesting to see if, with the USA label, the entrepreneurs do not in fact concentrate their strategy on only one State or on only a few States.

◊ On the other hand, it is known that one of the major problems in internationalization is that of protection from the risks of appropriation (Buckley and Casson, 1976; Oxley, 1997). These risks are especially great, however, if the business is in an innovative sector, one involving rapid growth and mobilizing rare assets and capabilities, and if the risks concerning the definition and control of property rights are substantial (Oxley, 1999). The high-technology start-up will therefore have an interest in initiating its development abroad by minimizing such risks of appropriation in order to be able to concentrate on its economic activity as such and the problems of technology transfer (Teece, 1986).

Limits of the Study

Although we have until now endeavored to point out the aspirations of the present study, we are not unmindful of a certain number of limitations. We describe three of them below.

First, it can be pointed out that among the variables we possess, a certain amount of information which would make it possible to enhance our analysis is unfortunately lacking. We do not actually possess information on the characteristics of the entrepreneur, especially its nationality and/or the countries in which it may have worked previously (Anderson, 2000). Nor do we know what mode of governance (recourse to an intermediary or direct investment, for example) is employed in conjunction with the company's entrance into the country (Burgel and Murray, 2001). Lastly, we lack information that would enable us to know whether or not the growth of the start-up forms part of a business network, an element which can strongly guide the developmental path of the entrepreneurship (Martin, Swaminathan and Mitchell, 1999).

Second, it is certain that our empirical institutional environment approach is relatively rudimentary. As we have pointed out earlier, what we are examining is a complex, multi-faceted concept. It is therefore very simplistic to limit the inquiry to a variable which concentrates on formal legislative aspects. It is even more simplistic to lump 212 countries together under these five criteria.

Lastly, even if we include a YEAR variable, we do not really take into account the time dimension, i.e. the effect of possible institutional changes. But such changes have been significant during the period under examination. Many countries of the former Socialist bloc have undertaken the difficult process of institutional reform and are therefore in "transition", to employ the stock expression.

In addition, fifteen countries, including the United Kingdom and Germany, form the European Union. The influence of this factor is taken into account in our model (and appears very significant) but only statically.

Prospective Research Paths

The present study aims primarily to explore the still unknown links between international expansion and institutional diversity, for this population of business entities (high-technology start-ups), which plays a key role in a country's growth dynamic. The aim accordingly is more one of posing questions than of resolving widely discussed problems. We can therefore, in conclusion, outline certain prospective paths for research that this study has been able to identify.

The first would consist of examining start-up companies whose country of origin represents not only English and German legal environments, but French and Scandinavian systems as well. As indicated earlier, the case of the Socialist and former Socialist countries must be dealt with separately. Because of their respective paths of geographic expansion, it would be especially rewarding to see whether we find behavioral similarities between firms rooted in an English legal environment and those rooted in a French legal environment. These are the two most widespread legal environments. Conversely, the same question could be posed as regards firms rooted in the German legal environment and those rooted in the Scandinavian legal environment, two less widespread legal environments.

In the same perspective of extension of exploration, one could ask whether the firms of "small countries" react the same as those of the "large countries" (Great Britain and Germany falling within the latter category). In effect, numerous countries geographically small in size are often very open to exchanges and develop a more intense international culture (or a culture of internationalization). It could be asked whether that culture translates into entrepreneurial behavior and provides them a greater ability to manage their learning curve.

Lastly, as pointed out in the previous section, we should develop our knowledge of the networks formed by the entrepreneurs who internationalize their activities. The entrepreneurs are at a stage where equity capital is scarce and where their reputations are still being built. The network which supports this phase therefore plays a decisive role in the orientation taken by the new campaign (Yli-Renko, Autio and Sapienza, 2000).

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Graph 1
The learning curve of international experience

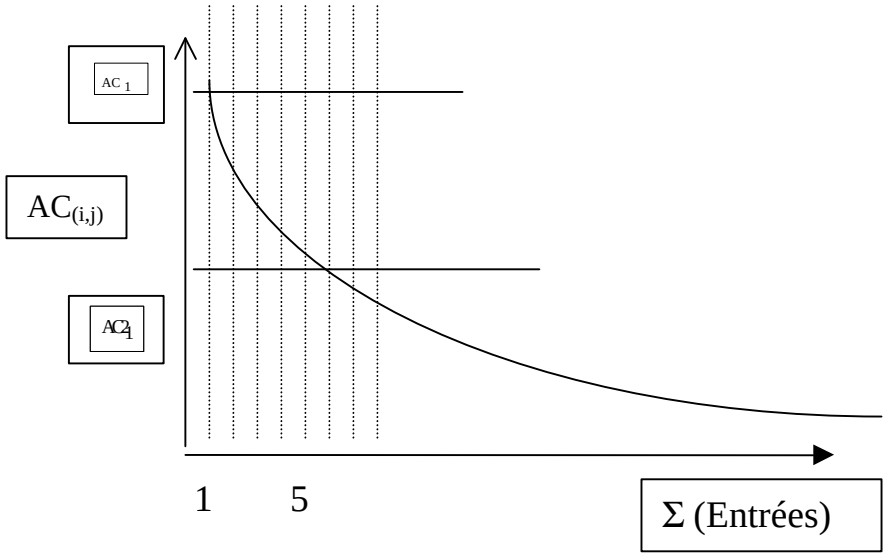

Table 1
Industrial cklassification of high-tech firms

Industries	Sigles	European classification (NACE)
Software	SOFTWARES	7220, 7260
IT and communications hardware	IT & COMM HARD.	3001, 3002, 3220, 3230
Engineering	ENGINEERING	3320, 3330, 3340
Life Science and Medical Technology	LIFE SC. & MED	2441, 2442, 3310
Other (mainly electronics components)	OTHER	3110, 3120, 3210, 3530, 2416, 2417

Source : Burgel et Murray (2000)

Table 2
Breakdown by legal environment of entries

	Nb of entries operated by UK firms	Nb of entries operated by German firms	Total
Into a Scandinavian legal environment	104	43	147
In %	11,0%	9,6%	10,5%
Into a Socialist legal environment	25	42	67
In %	2,6%	9,3%	4,8%
Into a French legal environment	338	153	491
In %	35,8%	34,0%	35,2%
Into a German legal environment	163	129	292
In %	17,2%	28,7%	20,9%
Into a English legal environment	315	83	398
In %	33,3%	18,4%	28,5%
Total	945	450	1395
In %	100,0%	100,0%	100,0%

Note : The percentage indicate the share of entries by legal environment for both UK and German start-ups.

Table 3
Breakdown by legal environment of first entries

	First entry of UK start-ups	First entry of German start-ups	Total
Into a Scandinavian legal environment	26	5	31
In %	10,8%	3,7%	8,3%
Into a Socialist legal environment	3	11	14
In %	1,2%	8,2%	3,7%
Into a French legal environment	68	47	115
In %	28,2%	35,1%	30,7%
Into a German legal environment	39	48	87
In %	16,2%	35,8%	23,2%
Into a English legal environment	105	23	128
In %	43,6%	17,2%	34,1%
Total	241	134	375
In %	100,0%	100,0%	100,0%

Note : The percentage indicate the share of entries by legal environment for both UK and German start-ups.

Table 4

Likelihood of entering a country with a legal system different from the home country (logistic regression)

	All cases (1)		United Kingdom cases (2)		German cases (3)	
	β	Std dev	β	Std dev	β	Std dev
GERMAN	-,016	0,147	-	-	-	-
Reference: 1st entry						
ENTRY(2)	0,198	0,188	0,107	0,236	0,327	0,338
ENTRY(3)	0,452*	0,200	0,421°	0,252	0,360°	0,357
ENTRY(4)	1,008***	0,228	1,059***	0,280	0,720	0,426
ENTRY(5)	0,369°	0,222	0,459°	0,277	-0,192	0,412
POLITICAL RISK	0,083***	0,007	0,062***	0,008	0,148***	0,018
GDP(lg)	0,016	0,058	-0,115	0,073	0,259*	0,117
YEAR	- ,027	0,029	-0,036	0,034	0,046	0,060
Reference: SOFTWARES						
IT & COMM HARD.	0,092	0,203	0,150	0,244	-0,285	0,405
ENGINEERING	0,015	0,213	0,066	0,254	-0,251	0,431
LIFE SC. & MED	-0,312	0,247	-0,108	0,302	-0,874°	0,466
OTHER	0,218	0,206	0,168	0,258	0,224	0,378
EU COUNTRY	3,435***	0,204	3,542***	0,243	3,400***	0,447
Constant	-1,369	2,760	0,462	3,230	-10,289	5,759
- 2 Log Likelihood	1340,778		888,392		398,504	
R2 (Nagelkerke)	46 %		48 %		52 %	
Taux de bon classement	76 %		78 %		71 %	

Coefficient (β) significant at 1‰ (***) ; 1% (**) ; 5% (*) ; 10% (°).

Table 5
Influence of Internationalization Variables by Institutional Environment

		β	Std dev		β	Std dev
Ref country:	UK			Ref country:	GER	
SCAND	Constant	20,854***	4,300	SCAND	6,530	4,456
	YEAR	-0,136**	0,045		-0,066	0,047
	POLITICAL RISK	-0,076***	0,011		0,175***	0,020
	GDP(lg)	-1,327***	0,104		-0,414***	0,103
	GERMAN	0,125	0,243		-0,563*	0,241
	SOFTWARES	-0,470	0,318		-0,175	0,327
	IT&COMM HARD.	-0,318	0,303		-0,147	0,318
	ENGINEERING	-0,285	0,332		-0,398	0,339
	LIFE SC. & MED	-0,490	0,388		-0,670°	0,398
SOC	Constant	-28,528**	8,657	SOC	-42,853***	9,039
	YEAR	0,249**	0,090		0,319***	0,094
	POLITICAL RISK	0,088***	0,011		0,339***	0,022
	GDP(lg)	0,044	0,131		0,957***	0,145
	GERMAN	2,128***	0,358		1,440***	0,382
	SOFTWARES	-0,538	0,485		-0,243	0,522
	IT&COMM HARD.	-0,698	0,440		-0,528	0,480
	ENGINEERING	-0,710	0,497		-0,823	0,529
	LIFE SC. & MED	-1,782*	0,840		-1,961*	0,868
FR	Constant	7,815**	2,779	FR	-6,510*	3,311
	YEAR	-0,054°	0,029		0,016	0,035
	POLITICAL RISK	-0,023***	0,006		0,227***	0,019
	GDP(lg)	-0,339***	0,059		0,575***	0,072
	GERMAN	0,452**	0,161		-0,236	0,177
	SOFTWARES	-0,279	0,212		0,016	0,252
	IT&COMM HARD.	-0,046	0,205		0,125	0,246
	ENGINEERING	-0,021	0,214		-0,134	0,246
	LIFE SC. & MED	-0,288	0,249		-0,468	0,288
GER	Constant	14,325***	3,537	EN	-14,325***	3,537
	YEAR	-0,070°	0,037		0,070*	0,037
	POLITICAL RISK	-0,251***	0,019		0,251***	0,019
	GDP(lg)	-0,913***	0,078		0,913***	0,078
	GERMAN	0,688***	0,197		-0,688***	0,197
	SOFTWARES	-0,295	0,268		0,295	0,268
	IT&COMM HARD.	-0,171	0,267		0,171	0,267
	ENGINEERING	0,113	0,266		-0,113	0,266
	LIFE SC. & MED	0,180	0,305		-0,180	0,305
- 2 Log	Likelihood	3180, 912				
R2	(Nagelkerke)	47,30 %				

Coefficient (β) significant à 1‰ (***) ; 1% (**) ; 5% (*) ; 10% (°).
Sector of reference : OTHER.