Available online at www.sciencedirect.com
ScienceDirect
Journal of Business Venturing 22 (2007) 833–851
JOURNAL of BUSINESS VENTURING

Acquiring financial resources from foreign equity capital markets: An examination of factors influencing foreign initial public offerings

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Received 1 March 2003; received in revised form 1 July 2006; accepted 1 September 2006

Abstract

An increasing number of firms are making initial public offerings in foreign markets to circumvent constraints in the availability of capital and to provide an exit for their investors. However, previous research on foreign initial public offerings and their determinants is very limited. In this paper, we contribute to this literature by demonstrating that international experience of the management team and pre-IPO ownership by foreign investors are positively related to foreign initial public offerings. We test our hypotheses using data on initial public offerings of European companies from 1991–2001. The results support our hypotheses. The findings have important implications for entrepreneurs, investors, and public policy.

Keywords: Foreign initial public offerings; Cross-border venture capital

1. Executive summary

In the late 1990's, the opportunities for European companies to acquire equity financing either from venture capital organizations or from public markets improved considerably. Increasing numbers of firms also made their initial public offerings in a foreign market both

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0883-9026/$ - see front matter
doi:10.1016/j.jbusvent.2006.09.001

to circumvent constraints in the availability of capital and to provide an exit for their investors. However, previous empirical research on foreign initial public offerings, and particularly their inter-relationships with pre-IPO financing, is very limited.

In this paper, we contribute to the body of research on financing strategies of entrepreneurial ventures by demonstrating that foreign venture capitalists and corporate investors as well as international experience are positively related to foreign initial public offerings. We test our hypotheses by employing data on foreign and domestic initial public offerings by European companies from 1991–2001. The results support our hypotheses.

Our findings on the increasing share of foreign listings, and our results concerning the effect of foreign pre-IPO ownership and international experience on the likelihood of foreign listing, have important implications for public policy. Prior research on venture capital markets has argued that venture capital is likely to flourish only if venture capitalists can exit from a successful portfolio company through an initial public offering (IPO), which requires an active and liquid stock market. In Europe, political action has been taken to allow the flow of funds across borders as a way to stimulate the creation of pan-European exchanges and more diverse financing sources. Our findings suggest, however, that this approach is insufficient because of home bias. Before such cross-border flows can be created, an equivalent effort must be put into stimulating more cross-border venture capital.

Despite the increased share of foreign initial public offerings, we find evidence of home bias, which limits the usability of foreign stock exchanges as exit markets. However, our research also suggests that there is an important mechanism for lowering the boundaries for foreign initial public offerings. In our empirical research of European companies' listings in foreign stock exchanges, we find that pre-IPO ownership by foreign investors increases the likelihood of listing on a foreign stock exchange when making an initial public offering. This phenomenon can be interpreted as foreign venture capital investment opening up new foreign exit opportunities in response to domestic public markets that are illiquid or inefficient. By easing the barriers to cross-border venture capital and private equity investments and by encouraging entrepreneurs to operate abroad, Europe would not only be investing in future growth but also establishing a basis for better capital flows.

The results suggest that European exit markets have developed in a positive way for entrepreneurs and venture capitalists, and that cross-border exit markets are available in different European countries. One can only hope that the drop in cross-border investment in the early 2000's and subsequent closing of newly founded alternative exchanges is only a temporary reversal to the gains made in European investment environment. For companies "born global," the positive relationship between foreign listings and foreign ownership can provide comfort. Foreign venture capital and corporate investors may help lower the boundary for going public abroad, further enhancing the globalization strategy. However, entrepreneurs planning to reside in their home country need to consider the costs and benefits of foreign ownership at the outset. Reputable foreign venture capitalists can and do add value. But the benefit comes with the risk of driving company control abroad as the exit for investors approaches.

2. Introduction

Up until the late 1990's, the availability of financing was one of the greatest obstacles for the expansion strategies of European growth companies. Compared to their American counterparts, for most of the decade institutional investors and the public market in Europe showed little interest in the majority of the region's new breed of growth companies. As a consequence, many small companies seeking a public market ended up doing their initial public offerings in the United States, mainly on the NASDAQ Stock Market (Bannock, 1994).

Throughout the 1990's, financial markets and European integration tried to abolish the barriers to investment in European growth firms (Muzyka et al., 1998). The European Union has taken an active role in this through political action to remove those barriers within the region. The Investment Services Directive and the requirement for common accounting principles across the economic area are two examples of such actions. These regulatory changes contributed to the formation of European alternatives to NASDAQ, namely AIM (1995), Nouveau Marché (1996), EASDAQ (1996), Neuer Markt (1997) and techMARK (1999), along with smaller projects by the national stock exchanges of different countries. After a few years of slower development following the collapse of the stock markets in the late 1990's, new initiatives have been started again to enhance the functioning of European stock markets for growth companies (see e.g. European Commission, 2005).

Improvement in Europe's equity culture, free capital flows across borders, a common currency, and consistent regulations could potentially alleviate the constraints of available equity capital across Europe. This is crucial, as it may not only increase the amount of foreign capital mature European companies can attract, but also reduce the inconsistencies across Europe in the availability of venture capital and other forms of financing for small firms. There is a strong relationship between the functioning of secondary markets and the availability of venture capital (e.g. Black and Gilson, 1998, 1999). Through this relationship, a well functioning exit market enables not only growth financing for small firms, but also the existence of professional services that offer support beyond just money. As the borders open, opportunities for companies to raise financing through cross-border transactions improve, including public offerings of shares.

In this paper we study what factors influence whether companies choose to make a foreign public market listing. Listings by European companies on other European public markets are still rare, especially initial offerings. Despite the formation of the European Union and its drive for a common financial market, country barriers still matter a lot. But as the European capital market becomes more unified, the number of foreign initial public offerings should increase. The characteristics of previous foreign listed companies quite likely indicate the determinants of future listings and their success factors.

In the context of this paper, a foreign IPO is defined as an initial public offering that a company makes in a country that is not its home country. In this paper, we limit our research to initial offerings and leave out other offering types such as seasoned offerings and cross-listings. This is done for several reasons. First, we want to study exchanges as an exit vehicle for investors. Some seasoned offerings do involve the sale of existing securities, but most are used to raise capital for a listed company through new issues. Similarly, cross-listings do not necessarily involve the sale of securities, just the expansion of trading locations. Second, limiting the paper's scope to initial public offerings is justified when examining foreign stock exchanges as an exit for young entrepreneurial ventures and their investors. Blue chip companies use cross-listings and especially multi-listings to serve a large institutional investor base or raise large amounts of capital. In contrast, state-owned company undergoing privatization has been the typical profile for a multi-listing in Europe. As these issues differ quite a bit from the venture capital backed and small and medium sized firms we are interested in, such situations can be considered as outliers. Plenty of good quality research can be found on the impact of cross-listings on foreign exchanges (see e.g. Foerster and Karolyi, 1999; Karolyi, 2006; Lins et al., 2005; Pagano et al., 2002). However, research on foreign initial public offerings is much more limited, especially when considering factors relevant for entrepreneurs and their financing strategies.

In this study we focus on the determinants of foreign initial public offerings. Although there are a few recent studies sharing this general focus (Blass and Yafeh, 2001; Bruner et al., 2004), our study is unique in that it takes the perspective of entrepreneurial ventures and considers the issues such as foreign pre-IPO investors and international experience of the top management team, in addition to some of the finance-related determinants examined in earlier studies. Given this focus, we examine the ownership structure of the firms, either by entrepreneurs, corporate investors or venture capitalists, prior to the IPO. We are interested in the owners because they are the most influential stakeholders in a listing. As our interest lies in cross-border transactions, we look especially at the split of ownership between foreigners and domestic investors before the IPO. We also examine the international experience and international operations of the company as determinants of foreign IPOs given their role in improving the international entry capabilities of young ventures (George et al., 2004).

Given the focus of our paper on the determinants of foreign IPOs and related theoretical arguments, we treat “foreignness” as a binary variable. An IPO is either foreign or it is not. Although studying the determinants of selection among various foreign stock exchanges would create additional understanding of foreign IPOs, such an analysis would be quite different from our focus and would require a different type of research design. As shown later in our description of the data, foreign IPOs overall are very rare. There may be only a single specific country-to-country pair in the whole 10 years of data, which would make it hard to draw statistical conclusions. Given the “rare event” nature of foreign IPOs and our theoretical focus on international entry capability related to firm-level determinants of these offerings, we had to rely on a case-control research design and an appropriate rare events logistic regression method. The data collection from prospectuses with the case-control design would be problematic in the dyadic analysis needed to explain the choices between alternative foreign stock exchanges. Given that the focus of our analysis is on the factors influencing foreign initial public offerings rather than selecting between various foreign stock exchanges, the focus on the binary measure of foreign IPOs is justified.

Our paper contributes to the newly emerging stream of literature on foreign IPOs (e.g. Blass and Yafeh, 2001; Bruner et al., 2004; Ejara and Ghosh, 2004; Kadiyala and Subrahmanyam, 2002) by being the first one to examine firm-related determinants of foreign IPOs. In contrast to other early studies on foreign IPOs that primarily examine stock exchange related issues and post-IPO performance in foreign IPOs, we examine the role of various company characteristics. These attributes include: high-tech focus; size in increasing the need for foreign IPOs; international entry capability related to effects of international management experience; international operations; and foreign pre-IPO ownership in facilitating foreign IPOs. On the basis of our findings and prior research on international entrepreneurship and financial markets, we derive implications for entrepreneurs and investors concerning the opportunities that arise through foreign equity markets. The findings also have important implications for public policy.

The rest of the paper is structured as follows. Section 3 provides a literature review and develops the hypotheses. Section 4 discusses the data and the methods we use in the empirical analyses. Section 5 reports the results. Finally, Section 6 provides a discussion, conclusions, implications for various stakeholders, and limitations and avenues for future research.

3. Theoretical background and hypotheses

Foreign IPOs are a niche area in the finance research field. The relatively low amount of research reflects the fact that foreign IPOs themselves are quite rare. The nature of the phenomenon raises the question of why foreign IPOs are so seldomly made. The question is especially relevant in Europe, where European integration was expected to increase the flow of capital across borders and cross-border investments. The long-term effects of the process may not only determine how European companies attract foreign capital, but also how regional differences affect the development of stock exchanges and venture capital.

Foreign initial public offerings have emerged as a new stream of research in recent years (e.g. Blass and Yafeh, 2001; Bruner et al., 2004; Ejara and Ghosh, 2004; Kadiyala and Subrahmanyam, 2002). The existing body of research on foreign IPOs primarily takes a financial perspective identifying differences in stock exchanges as drivers of foreign IPOs, and the empirics primarily focus on post-IPO differences in trading and share price performance. In contrast to prior research, we take a more strategic perspective and focus on ex ante factors explaining the decision of new ventures to become publicly listed on a foreign stock exchange. In our analysis, we focus on three main types of determinants of foreign IPOs: firm-level factors that increase the need to go abroad; international experience making it easier; and foreign pre-IPO ownership facilitating and driving foreign IPOs. Overall, the main thrust of our argumentation is that foreign top management team experience, international operations, and foreign pre-IPO ownership increase the internationalization capabilities of companies and therefore improve the opportunities to tap international capital markets.

3.1. Company characteristics increasing the need for foreign IPOs

Market segmentation is one of the reasons companies have to consider options beyond domestic IPO markets. The widely studied and used theory of market segmentation mainly comprises two hypotheses that explain the differences in investment patterns among geographical areas. These two hypotheses are the *investor recognition hypothesis* (Merton, 1987) and the *segmentation hypothesis* (Stulz, 1981). According to market segmentation theory, the financial market has barriers to investment that companies should remove by seeking markets that provide the highest awareness among a large investor base. Lower barriers result in lower required risk premia and higher valuation. These theories, however, traditionally look at the issue only from the investor and cost of capital side and ignore pathdependent decisions made by entrepreneurs in the early stages of company development, including venture capital financing.

Previous studies show that investment barriers lead to investors owning much more in local country shares than what the portfolio theory implies (Grinblatt and Keloharju, 2001; Kang and Stulz, 1997; Stulz, 1981). This investor behavior pattern is called the home bias. Several factors can cause the bias, including taxation, cross-border transaction costs, hedging, agency-related costs such as control of the company, and culture and language. However, though various costs, tax and regulatory barriers may limit cross-border investment to some extent, today many authors argue that the direct costs of foreign investing and benefits of hedging are relatively low (see e.g. Cooper and Kaplanis, 1986; Uppal, 1992). Most studies conclude that the real reason for investing primarily in the local market is unfamiliarity with foreign assets. The claim has been supported by several recent studies. For example, Grinblatt and Keloharju (2001) show in their study of Finnish stocks that investors are more likely to hold, buy, and sell the stocks of Finnish firms that are located close to the investor, that communicate in the investor's native tongue, and that have chief executives of the same cultural background.

Limited information availability is especially severe in the case of IPOs where the companies are relatively young and unknown. Subrahmanyam and Titman (1999) argue that companies prefer large markets or markets where a large number of similar companies are already listed because of the low cost of information transfer. For example, in a large market, analysts are more likely to receive serendipitous information (information acquired by luck or with no cost), thus they experience "economies of scale" that lower their overall cost of acquiring information.

The benefits of lowering the cost of information are especially pronounced when it is difficult to analyze the company. Consequently, high-tech companies are more likely to seek markets where similar companies are listed. It is therefore not surprising that seeking an investor base that "understands" the business of the IPO candidate is often cited as the reason for listing overseas. Pagano, Röell, and Zechner (2002) find that R&D intensive companies are more likely to make a cross-border listing than others possibly because they seek this understanding. Based on this, we hypothesize that the same applies for straight foreign IPOs and that operating in a high-tech industry proxies the difficulties of information transfer.

Hypothesis 1. Operating in high-tech industries increases the likelihood of a foreign initial public offering.

Although each public offering has its own balance of different motives, in most cases an IPO is primarily made to raise the financing needed to fund growth and to supply an exit vehicle for existing investors. Company size is always an important determinant in IPOs. Large companies may seek a public market rather than a private market simply because private institutions cannot provide the desired amount of cash. When capital requirements are high, the market where the IPO is made must be large enough to absorb the issue. This requirement is most clearly seen in the dual-listings of European companies. Companies that were dual-listed in the 1990's were predominantly large teleoperators and privatizations that needed to tap into several equity markets to gather the amount of money they sought. In foreign IPOs the situation is likely to be the same; large companies may be more likely to seek larger markets from abroad (Bruner et al., 2004). We therefore hypothesize as follows:

Hypothesis 2. The size of the venture is positively related to the likelihood of a foreign initial public offering.

3.2. International experience and operations facilitating foreign IPOs

Home bias may be reduced if the founders or managers of the company have international experience. Previous research on international entrepreneurship has examined the influence of the international experience of the top management team on internationalization. The research has focused on two dimensions of this: work experience and education. Research shows that past experience and contacts are likely to be major determinants of the perceptions of managers. Bloodgood et al. (1996) and Burgel and Murray (1998) found a positive and significant association between foreign work experience of the managers and the degree of a new venture's internationalization. Burgel and Murray (1998) also found that a higher percentage of managers of companies that internationalized had worked for a foreign company in their home country. We therefore hypothesize that foreign experience of the members of the management team is positively related to the likelihood of foreign IPOs.

Hypothesis 3. Foreign experience of the top management team increases the likelihood of a foreign initial public offering.

Experience from international operations makes it easier to list abroad. International operations facilitate the creation of international entry capabilities (George et al., 2004). A multinational corporation is culturally more suitable for foreign financing, and its organizational structure supports the investor base better than that of a company only operating domestically. A multinational should also have better investor appeal in multiple countries, allowing it to sell shares in the market it wishes. While there are no studies on foreign IPOs testing this argument, prior cross-listing studies show that cross-listings are done mostly by large multinationals (e.g. Foerster and Karolyi, 1999). We therefore hypothesize as follows:

Hypothesis 4. Having operations and facilities in more than one country increases the likelihood of a foreign initial public offering.

3.3. Foreign pre-IPO ownership facilitating foreign IPOs

Venture capital has traditionally been considered a local business. Venture capitalists normally invest in companies that are physically close to them (Gupta and Sapienza, 1992; Sorenson and Stuart, 2001). They also syndicate with other venture capitalists near them (Bygrave and Timmons, 1992; Sorenson and Stuart, 2001). Recently, however, this picture has started to change. Cross-border venture capital investments, i.e. venture capital investments in foreign companies, have become increasingly common (Bottazzi et al., 2004; Deloitte, 2006; Mäkelä and Maula, 2005; Wright et al., 2005).

Although there is no prior research concerning the role of foreign venture capital investors in foreign initial public offerings, we believe that the earlier findings concerning the certifying role of venture capitalists found in studies of domestic IPOs are also likely to be relevant within the context of foreign IPOs. Prior research on the role of venture capitalists in initial public offerings shows that venture capitalists work as producers of information (agents) and through this certify the company's quality to the market (Fried and Hisrich, 1994; Megginson and Weiss, 1991). Barry, Muscarella, Peavy, and Vetsuypens (1990) argue that the underpricing of venture-backed IPOs is lower as a consequence of the monitoring and certification role played by venture capitalists.

Therefore, we believe that foreign venture capital investors may help lower the boundary of going public abroad by reducing the portfolio company's liability of foreignness (Mäkelä and Maula, 2005). Furthermore, foreign ownership is likely to force the company to operate more internationally than companies with purely domestic ownership. We therefore hypothesize that foreign venture capital is positively associated with foreign public offerings.

Hypothesis 5. Ownership by foreign venture capital investors increases the likelihood of a foreign initial public offering.

Founding entrepreneurs and parent corporations, though large in terms of their ownership and control over the firm, are in many ways investors like others and are likely to have a home bias in their investments. If home bias exists, entrepreneurs and corporations may prefer to list the company in a location closer to them. For example, Pagano, Röell, and Zechner (2002) note that cross-listings are culturally dependent. Companies tend to cross-list in countries geographically or culturally close to their country of incorporation. We therefore form the following hypothesis.

Hypothesis 6. Ownership by foreign entrepreneurs and corporate investors increases the likelihood of a foreign initial public offering.

4. Data and methods

4.1. Empirical setting

The empirical setting of the present study is the foreign initial public offerings made by European companies between January 1991 and April 2001. In Europe, foreign IPOs are seldomly made. Table 1 below shows the distribution of foreign IPOs over time by European companies. Only 5.7% of all European IPOs made between January 1991 and April 2001 were foreign. Of these foreign IPOs, over 20% were done in nearby countries that are culturally similar and use the same language as the company's home country. The United States, however, is by far the most common target country for foreign issues. As the United States is known to have an efficient financial market, this indicates that foreign IPOs are often made when domestic markets are underdeveloped. The assumption is supported by the fact that the proportion of European IPOs in the United States has steadily decreased. As European IPO markets started developing in the late 1990's, they offered a viable alternative to the United States thus reducing the need to do an IPO there. As Table 1 shows, the number of foreign IPOs in Europe did not decrease but rather increased over the period, showing the increasing importance of cross-border IPOs in the region and the improved functioning of its internal exit markets.

Table 1
Foreign IPOs by European companies between 1991 and 2001

Year	Foreign IPOs by European companies	% of all European IPOs	Number of European foreign IPOs made in N-America	% of European foreign IPOs made in N-America
1991	1	2.0	1	100.0
1992	7	16.7	6	85.7
1993	10	16.7	9	90.0
1994	9	3.7	8	88.9
1995	14	7.7	13	92.9
1996	26	8.4	19	73.1
1997	23	6.1	14	60.9
1998	16	4.5	7	43.8
1999	28	6.2	9	32.1
2000	28	4.0	4	14.3
2001	1	1.2	1	100.0
Sum and mean %	163	5.7	91	55.8

4.2. Data

In our analysis explaining foreign IPOs by European companies, we built our dataset first by leveraging the SDC Platinum New Issues database and then collecting a unique database of ownership and business data from the prospectuses of individual companies. In contrast to the few existing studies on foreign IPOs that predominantly take a finance perspective and rely purely on databases, we were interested in information that is not readily available from databases, such as pre-IPO ownership and the international experience of top management. Therefore, we had to collect the needed variables manually from the prospectuses of the IPO companies. The prospectuses were downloaded from the Pioneer database of Perfect Information Ltd., the leading source of European IPO prospectuses. Stock market data was collected from Thomson Financial's Datastream database. We also corrected for some well-known problems of SDC and the possible selection bias resulting from the availability of prospectuses.

Our dataset contains basic information on all IPOs of European companies in North America and Western Europe between January 1, 1991 and April 26, 2001. From this dataset, we created detailed representative samples of foreign and domestic issues. After the cleanup, our resulting dataset of IPOs of European companies contained 2862 unique entries. Of these, 163 (5.7%) are foreign.

Given the need to collect data manually from the prospectuses of both foreign and domestic IPOs of European companies, we used the case-control design (King and Zeng, 2000) and extracted two subsets of this dataset for closer scrutiny and collected the prospectuses from the Pioneer prospectus database. The first set contains all issues by European companies to a foreign exchange where a prospectus was available. This set of 98 IPOs represents fairly well the 163 total foreign IPOs by European companies recorded by SDC. The control data set contains 106 randomly selected issues made by European companies on their home stock exchange. These were chosen from the set of 2699 entries in the SDC dataset. All of the necessary data were then collected for each IPO from individual prospectuses.

4.3. Variables

The dependent variable, a *foreign IPO*, is a dummy variable indicating whether the company made its IPO in a market that resides outside its home country. The variable was given the value of 1 if the IPO was made into a foreign stock exchange and 0 otherwise. The home country in this case is where the core of operations and the headquarters is located. If the company lists in multiple exchanges in multiple countries simultaneously, the offering is considered foreign as long as none of the target exchanges is in the home country. Electronic trading systems without an official exchange status, such as SEAQi, were not considered foreign exchanges.

High-technology focus is measured as a dummy variable capturing whether the company operates in a high-tech industry. The classification was made using the SIC codes recorded in SDC. *Size of the venture* is operationalized as the market capitalization at the time of the IPO. Market capitalization is calculated as a number of shares outstanding after the issue times the offer price per share. Market capitalization is considered to be the best proxy for size. It not only highlights the investor's impression of the size of the firm but also proxies the capital needs of the company at the time of the IPO. If there are multiple classes of shares, only those offered to the public are used in the calculations. The market capitalization is normalized using natural logarithm.

Management foreign experience is a dummy variable measuring whether the management has substantial work or educational experience from a foreign country. The data for the variable is collected from the management and board member bios found in prospectuses. Venture capitalist board members' foreign experience is not included because venture capitalist influence is measured separately. *International operations* are also measured as a dummy variable. A company is classified as having international operations if it reports having facilities and a significant proportion, i.e. 10% or more of all employees in more than one country. Sales offices are not considered foreign facilities unless they employ a majority of the company's employees.

Foreign pre-IPO ownership is measured in two categories: foreign venture capital investors and foreign entrepreneurs or corporate investors. Given the distinct nature of venture capitalists as a source of funding tapped in the venture's growth stage of development, versus individuals and corporations that often are founding partners, we wanted to highlight the distinct role of foreign VCs in comparison to other types of foreign pre-IPO owners. The information was collected from the prospectuses of the companies. For both categories, total ownership of the category is the sum of up to three of the largest owners in the category. However, if the ownership stake of an investor is below 3% before issue, it is not recorded. This limit has been set as both researchers and exchanges commonly use the 3% limit in determining whether an owner has a substantial share of ownership and an influence on corporate decisions. Measuring the ownership of the three largest owners is considered a suitable compromise between the data collection effort and rigor of the database. If it can be clearly seen that some shareholders belong to the same family or are under the same control for some other reason, ownership is aggregated into one group. As a robustness test we also run the analyses collapsing these two categories into one variable measuring all foreign pre-IPO ownership.

As control variables, we measure the timing of the IPO as dummies marking the period. We split the years into five periods when the IPOs occurred (1991–1992, 1993–1994, 1995–1996, 1997–1998 and 1999–2001). The 1991–1992 period was used as the base category.

4.4. Rare events logistic regression

Our dependent variable is a binary variable indicating the choice of the venture to go public abroad instead of its home market. Because of our comprehensive list of IPOs, we know that the share of foreign IPOs is small, only 5.7% of all European initial public offerings in our data. Therefore, our data can be classified as rare events data, binary dependent variables with significantly fewer 1's ("events") than 0's ("nonevents"). Such variables have proven difficult to explain and predict because popular statistical procedures can sharply underestimate the probability of rare events, and commonly used data collection strategies are inefficient for rare events data (King and Zeng, 2000; King and Zeng, 2001). To strike a balance between collecting a sufficient number of zeros and collecting enough explanatory variables with the given resources, we employ the "rare events logistic regression" methodology developed by King and Zeng. We correct our logistic regression by weighting the sample, as we know the proportion of events in the whole population. This results in a *weighted exogenous sampling maximum-likelihood estimator*. This computation is done with the ReLogit module for Stata. For details and discussion of the method, see King and Zeng (2000).

5. Results

5.1. Main findings

Table 2 reports the descriptive statistics and Spearman correlations for the 203 observations included in the substantive model. The correlations are low, suggesting that multicollinearity should not cause a problem in the regression analysis.

The results from our rare events logistic regressions of the determinants of foreign IPOs of European companies are presented in Table 3. Model 1 reports the results from the hypothesis tests using rare events logistic regression with a case-control design. Model 2 is a robustness test that adds a control for potential sample selection related to the availability of prospectuses.

Supporting Hypothesis 1, high-tech companies are more likely to make a foreign initial public offering. Apart from industry, firm size also increases the likelihood of a foreign IPO, providing support for Hypothesis 2.

In Hypothesis 3 we predicted that international experience of the top management team influences the likelihood of foreign IPO. The results provide support for this hypothesis. In Hypothesis 4 we predicted that international operations increase the likelihood of a foreign IPO. This hypothesis was supported. We find that corporations operating internationally have a stronger tendency to make an initial public offering abroad.

In Hypotheses 5 and 6 we predicted that foreign pre-IPO ownership increases the likelihood of a foreign IPO. Providing support for these hypotheses, our results show that foreign ownership plays an important role in driving firms to foreign equity markets or allowing them to make a foreign initial public offering. Both foreign corporate or

Table 2
Descriptive statistics and Spearman correlations

Variable		Mean	S.D.	1	2	3	4	5	6	7	8	9	10
1	Foreign IPO	.48	.50										
2	High-tech industry	.48	.50	.13									
3	Size of the venture	18.67	1.62	.30	.07								
4	International experience of the top management team	.53	.50	.24	−.03	.22							
5	International operations	.35	.48	.33	.07	.13	.17						
6	Pre-IPO ownership by foreign venture capital investors	.08	.18	.39	.19	.21	.17	.24					
7	Pre-IPO ownership by foreign entrepreneurs or corporate investors	.15	.30	.39	.01	.32	.28	.17	.17				
8	Timing of the IPO, years 1993–1994	.07	.26	.03	−.08	.06	−.03	−.05	−.14	.08			
9	Timing of the IPO, years 1995–1996	.13	.34	.03	−.06	−.09	−.06	−.02	.10	.06	−.11		
10	Timing of the IPO, years 1997–1998	.25	.43	.09	−.07	−.15	−.10	.08	−.10	−.11	−.16	−.22	
11	Timing of the IPO, years 1999–2001	.52	.50	−.09	.14	.18	.13	−.01	.13	−.01	−.29	−.41	−.59

N=203, includes all observations with prospectus info (98/163 foreign IPOs and 105/2699 domestic IPOs).

entrepreneurial ownership and foreign venture capital are positively related to a foreign IPO, providing support for Hypotheses 5 and 6. The strength of the effect is higher for corporate and entrepreneurial ownership. New ventures founded by foreign entrepreneurs or subsidiaries of large foreign companies are more likely to make a listing closer to their owners than venture-backed companies.

Our control variables show that time has no significant effect on the tendency to make a foreign IPO.

5.2. Robustness tests

In addition to the main analyses, we ran several additional tests to ensure the robustness of results. These robustness tests are explained in the following sections.

5.2.1. Control for potential selection biases

The availability of prospectuses in the Pioneer database should be close to random. There is, however, a potential selection bias in the availability of prospectuses as it is more likely that prospectuses from certain countries, from larger IPOs and from IPOs happening closer to the end of the 1990's can be found. The random sampling used to obtain the control dataset corrects some but not all of these problems. The number of IPOs in early years is so small that random sampling results in too small of a control sample for those years. Therefore, manual selection was used also for the control sample in the years 1991 to 1993.

Table 3
Rare event logistic regression tests of the determinants of foreign IPOs by European companies

	Hypothesized direction	Dependent variable: Foreign IPO?	
		Model 1	Model 2
Independent variables			
Hypothesis 1: High-tech industry	+	.893 **	.805 *
		(.378)	(.388)
Hypothesis 2: Size of the venture	+	.220 *	.204 *
		(.109)	(.112)
Hypothesis 3: International experience of the top management team	+	.723 *	.677 *
		(.384)	(.378)
Hypothesis 4: International operations	+	.670 *	.708 *
		(.406)	(.421)
Hypothesis 5: Pre-IPO ownership by foreign venture capital investors	+	1.815 +	1.717 +
		(1.184)	(1.218)
Hypothesis 6: Pre-IPO ownership by foreign entrepreneurs or corporate investors	+	2.105 ***	2.161 ***
		(.644)	(.602)
Control variables			
Timing of the IPO, years 1993–1994	+/−	.757	1.013
		(1.239)	(1.289)
Timing of the IPO, years 1995–1996	+/−	1.160	1.303
		(1.096)	(1.120)
Timing of the IPO, years 1997–1998	+/−	1.415	1.388
		(1.076)	(1.094)
Timing of the IPO, years 1999–2001	+/−	.500	.162
		(1.046)	(1.114)
Lambda (sample selection correction factor based on inverse Mill's ratio)	+/−		−2.807
			(2.842)
Constant	+/−	−9.216 ***	−3.394
		(2.204)	(6.079)
N		203	203

*** $p<.001$, ** $p<.01$, * $p<.05$,+ $p<.10$, one-sided tests for hypothesized variables, two-sided tests for control variables. Unstandardized coefficients and robust standard errors are reported.

As a robustness test to control for the potential selection biases in the sample, we applied the Heckman (1979) two-stage selection model to obtain unbiased estimates. In the Heckman model, a correction factor lambda is included in the main regression equation to count for potentially biased selection. We estimated the lambda correction factors regressing the probability of finding an accessible prospectus over issue period (dummies for all age periods except for the base category) and issue target exchange (dummies for the most common target markets having more than five observations within the set of included IPOs and both foreign and domestic IPOs). In Model 2 we added a control for potential sample selection bias related to the availability of prospectus information. The control is insignificant, suggesting that sample selection should not be a problem. Furthermore, the coefficients are very similar to those in Model 1. The results of the procedure indicate that the possible unavailability of prospectuses did not significantly change our results.

5.2.2. Control for differences between foreign IPOs in the United States versus other markets

A relatively large share of the foreign IPOs was concentrated in the United States. It is possible that the drivers could be different for foreign IPOs in the United States versus those made in other countries.[2] To test for the potential differences between the two types, we ran a robustness test employing multinomial logit regression model, in which we specified the dependent variable as a categorical variable with three categories: (1) domestic IPO, (2) foreign IPO (US), and (3) foreign IPO (other). The results indicate that the drivers of foreign IPOs in the United States and in other countries are largely similar. For instance, the effects of both types of foreign pre-IPO owners were positive for both types of foreign IPOs (significant in all cases except for pre-IPO foreign VCs in non-US IPOs, which was only weakly significant) and the differences between the coefficients were statistically insignificant. However, we found two statistically significant differences in the drivers of US versus non-US foreign IPOs. First, the size of the company was a more important determinant of the ones made in the US than elsewhere. This seems quite intuitive because the NASDAQ, and the US in general, clearly enables larger offerings than most other markets. Second, international operations were less important in foreign IPOs in the US. However, although it is interesting to see that there are some subtle differences between some of the drivers of foreign IPOs in the US and elsewhere, broadly speaking the key drivers are quite similar.

5.2.3. Potential interrelationships between the independent variables

Finally, we addressed the potential interrelationships between the independent variables. In particular, we tested whether high-tech industry leads to higher pre-IPO foreign ownership or whether size is associated with international operations, which subsequently lead to a higher probability of a foreign IPO.[3] To test these mediation effects, we followed the procedure suggested by Baron and Kenny (1986) and found no support for such mediation effects.

6. Discussion and conclusions

We set out in this paper to analyze factors influencing the decision of ventures to become public in a foreign exchange instead of their domestic stock exchange. We found that European companies have increasingly made direct cross-border listings within Europe as European secondary markets have developed. At the same time the importance of North America has lessened. The strategic options for financing young European ventures have clearly improved within Europe. When examining the determinants of foreign IPOs, we found support for our hypotheses related to high-tech firms and large firms having a higher propensity for foreign IPOs. In line with our arguments related to international entry capability, we found that international experience of the top management team and international operations are important determinants of foreign IPOs. We also found that both foreign corporate or entrepreneurial ownership and foreign venture capital are associated with a foreign listing. To summarize, we received support for all of our hypotheses.

[2] We thank an autonomous reviewer for suggesting this possibility.
[3] We want to thank an autonomous reviewer for suggesting these two mediation effects.

Our paper makes several contributions to the literature. First, the paper is among the first studies to examine the determinants of foreign IPOs. To our knowledge, the study is unique in that it examines the role of foreign pre-IPO foreign ownership, the existence of international operations, and the international experience of the top management team in encouraging foreign IPOs. The few existing previous studies have primarily focused on financial variables available in various databases (Blass and Yafeh, 2001; Bruner et al., 2004). To enable our more strategic approach and to test for the impact of pre-IPO foreign ownership and international experience of the top management team, we had to create a unique data set by manually collecting the needed variables from the prospectuses of foreign and domestic IPOs of European companies. The rich, hand-collected data enabled an examination of these several new determinants of foreign IPOs.

Secondly, the paper contributes to the emerging understanding of international entry capabilities (George et al., 2004) by showing that international experience of the top management team and international operations increase the likelihood of foreign IPOs. While prior research has shown the importance of the track record of top management in IPOs (see e.g. Higgins and Gulati, 2006), our study is the first one to show that top management team experience influences foreign IPOs.

Thirdly, our paper contributes to the emerging literature on cross-border venture capital (Mäkelä and Maula, 2005; Wright et al., 2005) as the first paper to measure the impact of cross-border venture capital in encouraging foreign IPOs. Fourthly, the paper contributes to the research on venture capital policy, which has argued for the importance of liquid IPO markets in attracting financing for innovation-focused ventures (Black and Gilson, 1998, 1999). Supporting some earlier arguments (e.g. Rock, 2001), our findings suggest that companies can partially circumvent the limitations of their domestic stock markets by making an initial public offering abroad. Our findings show that this strategy can be supported by foreign venture capital and other foreign pre-IPO ownership.

6.1. Implications for public policy

Since the original Investment Services Directive, Europe has seen the rise and partial fall of challengers to NASDAQ, the exchange where the majority of foreign IPOs has traditionally been made. Of these, EASDAQ was the most straightforward copy of NASDAQ. EASDAQ positioned itself as a pan-European exchange, as the founders anticipated that only capital flows from the whole European economic area could support the growth exchange in the long term. However, EASDAQ was unable to break the home bias inherent in Europe as shown clearly in this study. The resulting low number of traded firms failed to attract trade, and EASDAQ was forced to discontinue operations as an independent exchange. The same happened to German Neuer Markt. Despite its active attempts to source companies from Scandinavia and elsewhere, German companies and investors dominated the exchange. As the interest of German investors faded, spurred by the poor and interdependent performance of the listed firms, so did trading on Neuer Markt. It fell into exactly the same trap EASDAQ founders witnessed years before.

For public policy, this development and the results in this study have important implications. The demise of both EASDAQ and Neuer Markt show in a harsh way that investors' interest in single European economies has been insufficient to support market liquidity in volatile, high-risk industries such as IT and biotechnology. European companies must be willing and able to find capital outside the borders of single European countries. Public policy must support this activity but without favoring large blue chip companies or endangering local exchanges.

Capital already flows quite freely within Europe when it comes to trade between large investors and when trade also tends to happen with blue chip shares. The problem is that trade in such large-cap stocks may be detrimental to the growth of small firms in Europe. If trading in Europe is concentrated in only a few exchanges, and if cross-border trading occurs primarily on blue chip shares, national exchanges that depend on trade revenue from a few select blue chips may be endangered. As shown in several studies, growth financing, such as venture capital, needs a well-functioning local exchange. It is unlikely that entrepreneurs and financiers will show decreased home bias before they truly feel "European." This would require a cultural change that takes time. Unless encouraged to do otherwise, investors will continue to favor local alternatives and suffer from decreasing liquidity in local markets. As a result, the flow of capital to new ventures and the long-term growth of small economies may decrease.

As shown in this study, pre-IPO ownership structure has an impact on where and how companies are listed and how ownership is spread between investors later on. Therefore, rather than putting regulatory effort solely on the trade of companies already listed, more focus should be put on the financing of pre-IPO companies. The results of this study show that this has the potential of breaking home bias and facilitating cross-border trade. Easing cross-border venture capital and private equity investments would not only increase the likelihood of more available growth financing but also pave the way to an integrated market since the capital would increase the likelihood of cross-border listings later on.

The implications are actually surprisingly well in line with the experience from Israel. Rock (2001) argues that the core reason for Israeli companies to list on NASDAQ is strong venture capital flows from the United States, driven by cultural ties between the countries. The success of Israeli companies in listing on NASDAQ also creates a virtuous circle that brings capital to the country. This capital, backed by appropriate political action, has enabled the strong growth of the relatively small national economy.

6.2. Implications for entrepreneurs and venture capitalists

For entrepreneurs and venture capitalists, the results show that European exit markets have developed in a positive way and cross-border exit markets are available in different European countries. For companies "born global," the positive relationship between foreign pre-IPO ownership and foreign IPOs can be comforting. Foreign venture capital investors and corporate investors may help lower the boundary for going public abroad, further enhancing the globalization strategy. However, entrepreneurs planning to reside in their home country need to consider the costs and benefits of foreign ownership from the outset. Reputable foreign venture capitalists can and do add value (Mäkelä and Maula, 2005). But, the benefit comes with a risk of driving company control abroad as the exit for investors approaches. After the IPO, foreign ownership in small and medium sized companies is typically very limited (e.g. Dahlquist and Robertsson, 2001; Kang and Stulz, 1997), and the public owners mostly consist of the citizens of the country where the listing takes place. The quite considerable resources required in servicing a foreign investor base may drive several other factors such as the location of the firm headquarters, which severely affects the composition of personnel and the contact base of management and further influences the whole strategy of the firm.

Overall, the opening of borders in Europe offers both opportunities and threats for small firms. On one hand, open borders allow companies to tap into financial resources from multiple countries and decrease dependency on the domestic market. On the other hand, free capital flows drive the consolidation game between stock exchanges and related entities. Like in the United States, where several stock exchanges disappeared or merged with the New York Stock Exchange or the NASDAQ, a similar development can be expected in Europe. The best way for entrepreneurs to make sure this consolidation is not only for the benefit of blue chips is to boldly and openly look for cross-border opportunities. These create cross-border capital flows, bring knowledge to investors about foreign investment opportunities, and allow small exchanges in different countries to remain viable businesses.

6.3. Limitations and future research

In our research we faced several tradeoffs that led to limitations and potential avenues for future research. Most importantly, in contrast to other early papers on foreign initial public offerings, which primarily focus on financial aspects related to the benefits of listing in foreign stock exchanges, we focused primarily on factors related to international entry capability that enable companies to list on foreign stock exchanges. To analyze foreign pre-IPO ownership and international experience, we needed in-depth information from the listing companies that could only be obtained from the prospectuses, which made it impossible to collect information on all the companies. Therefore, we employed a case-control research design and appropriate rare events logistic regression method (King and Zeng, 2000) to test the hypotheses. Although difficult at the moment, improving data sources and methods could at some point make it feasible to combine the demand-based determinants of target stock exchanges from finance research with our international entry capability-based arguments, which require rich company data. Such data for all potential focal company target stock exchange dyads would enable an analysis of the determinants of the choice between alternative target stock exchanges. Concerning geographical limitations, we focused on foreign IPOs by European companies, a context that had not been studied extensively in prior research. Future research could replicate and expand the research in other contexts and geographical areas.

To conclude, this is one of the first studies examining the determinants of foreign IPOs. In our analysis, we contribute to the existing research by showing the impact of capability-related factors such as foreign pre-IPO ownership and foreign management experience, in addition to factors related to the benefits of the target market shown in early papers. To test our hypotheses, we collected unique, rich data from firm prospectuses and employed a case-control design and novel statistical methods to estimate the determinants of foreign IPOs. The findings show that foreign pre-IPO ownership and foreign management experience, among the other hypothesized factors, increase the likelihood of a foreign IPO. We hope this paper inspires new research to examine similar factors and mechanisms that support the integration of the financial markets and thereby open new avenues for entrepreneurs to raise funding to grow their companies.

Acknowledgements

We are grateful to Michael Hay, David Goldreich, Jan Mahrt-Smith, Gordon Murray and Stephen Schaefer from London Business School, Erkko Autio, Mikko Jääskeläinen and Tomi Laamanen from Helsinki University of Technology (affiliations as they were at the time of writing), as well as two anonymous reviewers for their assistance and comments during the authoring process. We would also like to acknowledge the generous support of the Jenny and Antti Wihuri Foundation, the Finnish Foundation for Share Promotion, as well as the Academy of Finland (grant 112129). An earlier version of the paper was selected as a runner-up of the Booz Allen Hamilton/SMS PhD Fellowship at the 22nd annual international conference of Strategic Management Society in 2002.

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