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FOREIGN OWNERSHIP OF FIRMS AND THE EUROPEAN STOCK MARKETS

Jani Hursti



TEKNILLINEN KORKEAKOULU
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Jani Hursti

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ABSTRACT

This dissertation examines foreign ownership of firms on the European stock markets from four viewpoints: those of foreign investors, domestic investors, companies, and stock exchanges. The dissertation offers the academic community new data and analysis of the relatively narrowly studied topic of foreign ownership. It also studies previously researched anomalies like home bias from new directions, including companies as active agents who demonstrate home bias in listing decisions and stock exchanges as firms that must cope with the behavior and preferences of foreign investors. The findings discussed in this dissertation contribute to the literature on investor behavior, initial public offerings, and share trading as well as offering practical insights on the development of European financial market in the 1990s.

A panel data analysis is used to study the preferences of foreign investors by assessing which firms foreign investors overweight compared to domestic investors. The results show that foreign ownership is highest in large companies, share classes with high turnover, shares that have performed well in the past, and shares of firms with a low return on equity. Investor preference is also shown to have a significant impact on listing decisions. A comparative study of companies that have been listed on the national exchange of their home country and those listed in a foreign market demonstrates that ownership by foreign pre-IPO investors is strongly associated with foreign initial public offerings. The results show not only that foreign IPOs are made very seldom but also that when a foreign IPO is performed its target market is associated with the home country of the largest owners.

The challenges imposed for stock exchanges by home bias are evaluated through a case study of the now discontinued pan-European stock exchange EASDAQ. The results show that, while firm-specific factors are important for the liquidity of individual shares, the nationality of the exchange where shares are listed is a significant determinant of share turnover. Finally, the dissertation shows that publicly available monthly aggregate foreign holding percentages can be used to construct a trading strategy for domestic investors but offers no premium that would not be explained by well-known models.

Keywords: Stock exchange, initial public offerings, foreign listing, foreign ownership, panel data analysis, investment strategy, investment style, venture capital, financial resources, liquidity, exit market, tracking portfolio, factor model.

TIIVISTELMÄ

Tässä väitöskirjassa tutkitaan yritysten ulkomaalaisomistusta eurooppalaisilla osakemarkkinoilla neljästä eri näkökulmasta: ulkomaalaiset omistajat, kotimaiset omistajat, yritykset itse ja arvopaperipörssit. Väitöskirja tarjoaa akateemiselle tutkimukselle uutta tutkimustietoa ja analyysiä ulkomaalaisomistuksesta ja erityisesti omistuksen vaikutuksista yritykseen ennen pörssilistausta. Aihepiiriä on tähän mennessä tutkittu verrattain vähän. Myös aiemmin tunnettuja markkinavääristymiä kuten kotimaisten osakkeiden suosimista analysoidaan uusista näkökulmista. Näitä ovat mm. pörssilistausta tekevät yritykset aktiivisina toimijoina, joiden omistajat suosivat tiettyjä markkinoita sekä arvopaperipörssit, jotka joutuvat ottamaan ulkomaalaisomistuksen huomioon omassa toiminnassaan. Väitöskirjan löydökset lisäävät ymmärrystä sijoittajakäyttäytymisestä, pörssilistauksista ja osakekaupasta sekä selittävät osaltaan eurooppalaisen arvopaperimarkkinan kehitystä 1990-luvulla.

Ulkomaalaisten sijoittajien preferenssejä analysoidaan käyttäen paneelidataa, joka mittaa minkälaisia yrityksiä ulkomaalaisomistajat ovat ylipainottaneet kotimaisiin nähden. Tulokset osoittavat, että ulkomaalaisomistus on korkeimmillaan yrityksissä, jotka ovat markkina-arvoltaan suuria, joiden osakkeilla on hyvä likviditeetti ja joiden osakkeiden historiallinen kurssikehitys sekä oman pääoman tuotto on ollut hyvä. Julkisen yrityksen myöhemmän omistuksen lisäksi omistajien tahto näkyy jo listauspäätöksissä. Osakkeensa ulkomaisille markkinoille listanneiden yritysten vertailu kotimaisiin listauksiin osoittaa, että listausta edeltävä omistusrakenne korreloi listauspaikan kanssa. Ulkomaisia listauksia tehdään verrattain harvoin ja kun näin tapahtuu, kohteena on tyypillisesti markkina, joka on suurimpien omistajien kotimarkkina.

Kotimaisten osakkeiden suosimisen haastetta arvopaperipörssille analysoidaan tutkimalla jo suljettua, maaneutraaliksi alunperin tarkoitettua EASDAQ-pörssiä. Tulokset osoittavat, että vaikka yritysکوhtaisilla tekijöillä on pääasiallinen vaikutus yksittäisen osakkeen kaupankäyntiin, myös itse listaamismaalla on tilastollisesti merkittävä vaikutus siihen miten vilkkaasti yksittäisellä osakkeella käydään kauppaa. Lopuksi väitöskirja osoittaa, että käyttämällä julkisesti saatavilla olevia tietoja osakkeen ulkomaalaisomistuksesta voidaan kotimaiselle omistajalle luoda kaupankäyntistrategia, mutta strategia ei tarjoa tuotto-preemiota, jota ei voitaisi selittää tunnetuilla preemiomalleilla.

Asiasanat: pörssilistaus, ulkomaalaisomistus, paneelidata, sijoitusstrategia, venture capital, likviditeetti

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My year at London Business School marks an important time in my studies of finance. This was not only a fun year but also intellectually gratifying. In the course of that year, I had the privilege to study alongside some extremely talented and bright individuals who introduced me to the necessary skills and number-crunching, and also the culture of the financial world. I would like to thank the Masters in Finance Class 2001 for the inspiring atmosphere that took me to the world of finance. Special thanks go to Tony Haworth and Martijn Rats for commenting on some of the early versions of my research. I’d also like to thank the teaching staff at London Business School and especially Helena Mullins, Michael Hay, David Goldreich, Jan Mahrt-Smith, Gordon Murray, and Stephen Schaefer, all of whom guided me in the research.

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Helsinki, June 2, 2006

Jani Hursti

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1 INTRODUCTION

1.1 Foreign Ownership in the European Financial Market

Today a global and integrated financial market is a reality that molds the traditional structures of the corporate world. Apart from offering large pools of capital for investment, it increases competition between providers, lowers the cost of capital, and offers the possibility to invest in riskier projects. For investors it offers the possibility to diversify and hedge away some country-specific risks. Integration takes place not only on a global scale but also within nations and economic areas that combine the various markets. Europe is one specific economic area where integration carries the promise of such a frictionless market between the members of the European Union. The European Union is a specific area of interest in this dissertation because it actively develops and expands also on the political front, spanning new financial markets that may become integrated.

As borders open, capital seeks new investment targets and ownership structures become internationally diversified. While multinational corporations operate far beyond national borders, corporations are still considered to originate and operate from a certain country. For most of us Microsoft is American, Mercedes-Benz is German, and Sony is clearly Japanese, no matter where these companies employ the majority of their employees or who owns them. Whatever they do outside their perceived home countries is seen as “exports” and owners from other countries are “foreign” owners.

We take pride in our respective nations' successful companies and the welfare they attract in the form of foreign investment. But at the same time many are concerned especially about changes in ownership and the changes foreign owners may impose through their decisions. Globalization potentially results in reallocation of resources and jobs at a pace that may be too much to bear for some of us. The global capital market offers great leverage for wealth creation at the cost of being a faceless profit maximizer that is impossible to control.

While foreign owners are everyday stakeholders in multinational corporations, they have been studied relatively little by the academic community. It would be essential, especially for policymakers, to understand how investors and firms behave under foreign ownership. Such understanding is necessary in order to catalyze global markets whenever it is beneficial and also to steer capital movement when necessary.

Understanding the diffusion of ownership across borders is also crucial for financial theory, since many theories assume the existence of integrated markets in order for the theory to work. Core theories such as the Capital Asset Pricing Model (CAPM) (Treyner 1961, Sharpe 1964, Lintner 1965) and its predecessors expect a certain level of globalization to be present. Simple CAPM assumes that all investors are mean-variance optimizers who hold a "world market portfolio" that contains shares from all over the globe in proportion to their capitalization relative to world wealth. In reality, this is hardly the case, and later modifications such as the international CAPM (Solnik 1974) and Arbitrage Pricing Theory (APT) (Ross 1976) with its international extensions (e.g., Ross and Walsh 1983, Solnik 1983) relax these assumptions of CAPM by stating that not all investors do need to act as mean-variance optimizers in order for shares to be efficiently

priced. In these theories it is enough for some investors to be active, since trading quickly removes any opportunities for arbitrage and leads to efficient pricing.

Still, international diversification does provide benefits that for some reason are not yet fully realized by investors. In efficient markets, all firm-specific risk should be diversified away. Any return premium left should be a result of common market risk factors such as inflation, oil prices, or exchange rates. These differ across markets, meaning that diversification through international investment would offer a possibility for diversification and offer a better risk-to-return ratio. But investors at large do not do a particularly good job in international diversification. They clearly overweight domestic stocks. This phenomenon, called “home bias,” has puzzled researchers for a good 30 years (Stulz 2005).

Within the European Union, the question of foreign ownership is particularly topical. The European Union has set a bold target of creating a single economic area that leverages the strengths of the member states and creates a strong economic force. One of the key components in improving the competitiveness of the European economy is the unification of the financial market. Europe aims to offer a unified and competitive environment for firms that face rivals from North America and Asia.

The need for a unified market was acknowledged a long time ago, and its construction has been ongoing since 1973 (European Commission 1999). In the Lisbon Special European Council Meeting in Portugal in March 2000, the European Council laid out a 10-year strategy to make the EU the world’s most dynamic and competitive economy. The rationale for the strategy is clear: a stronger economy within the EU’s borders is believed

to drive job and wealth creation, which together ensure sustainable wellbeing within the borders of the union. Still, today the Lisbon targets seem far away. In reality, Europe is still a very fragmented economic area with strong nationalistic attitudes, concentrated ownership structures, small local markets, and plenty of home bias. The EU recognizes that the fragmentation of its internal financial markets remains one of the key disadvantages of EU businesses, particularly when compared to the United States (European Commission 2004). The segmented market hinders the availability of capital to enterprises, decreases access to financial institutions, and raises the cost of capital.

The 1990s offered a crucial turning point for Europe's financial market in the form of the adoption of a common currency, the creation of certain key investment directives, and the privatization of large government enterprises. Privatizations have been the door opener for share ownership by individual citizens in Europe. In the 1990s, people across Europe became shareholders in such companies as Deutsche Telekom, France Telecom, Sonera (formerly Finnish Telecom), Telia, Statoil, British Energy, Deutsche Post, and Iberia, among many others. Consequently, Europe's development from the 1990s to the 21st century offers an excellent object for research into the subject of foreign ownership from an academic point of view.

While unification has taken place in the political arena, corporate financing in Europe has moved from a very bank-centric financing culture to an open-equity culture. Stock exchanges have been given a prominent role. The ups and downs of the stock market indices are nowadays considered the "heart rate" of an economy. And these indices illustrate the fragmentation of the European financial market in a very concrete fashion. Where the state of the U. S. economy is seen in the Dow Jones and NASDAQ indices

from New York, Europe still has multiple heart rates. The “footsie” from the U. K., the DAX of Germany, the CAC from France, and many others still measure economic activity from relatively small geographical areas – even though they do move somewhat in lockstep.

The subject of this PhD thesis is to look at the changing landscape of the European financial market in the 1990s and early years of the 21st century. It offers three important viewpoints on the topic: that of firms that raise capital from the unifying market, the view of investors who look for new opportunities as borders open, and the viewpoint of stock exchanges that act as the intermediaries in this process. The research focus is on cross-border, or foreign, ownership of enterprises.

The empirical data sets come from stock exchanges in Europe. Stock-exchange-listed companies represent the largest and most powerful companies within the union with significant economic value. Stock exchanges themselves are a key ingredient in the analysis. Their importance to the financial market is undoubted, and the merging of the markets has a profound impact on their operations. It is expected that, along with the change in the market, the exchanges will transform and merge, possibly altering the dynamics of the whole market.

1.2 Research Problem and Objectives

This dissertation focuses on examining the following research problem:

How has foreign ownership of European companies affected European capital market integration and cross-border capital flows in general, and trading in stock exchanges in particular?

This larger research question is studied in four independent chapters as four individual sub-problems.

I first examine *which firms foreign investors overweight when compared to domestic investors in two national exchanges within the borders of the European Economic Area*. The Oslo Stock Exchange and Helsinki Stock Exchange (now a part of OMX) are two Nordic exchanges where foreign ownership restrictions were abolished in the same year, in 1993. Since then, foreign ownership has increased in both exchanges. In Finland, the change has been quite radical, while in Norway it has been more moderate. Both countries are part of the European Economic Area (EEA), though Norway is not a member of the EU. Differences between the exchanges and between firms in the exchanges can show whether cross-border investments build up in firms with specific characteristics. If foreign ownership becomes concentrated in only certain types of firms on the local market, some local companies have fewer opportunities to raise foreign capital. If the supply of domestic capital is limited, these companies face a financing problem that sets them in an unequal position compared to other domestic companies, and possibly also to their foreign rivals, even if they are otherwise competitive.

I then take a look at the corporations themselves by studying *what kinds of small and medium-sized European companies have sought foreign equity at the time of their initial public offering*. The borders have opened not only for investors; they have done so for

companies, too. In an open market, companies should be willing and able to raise financing from public markets virtually anywhere. As an alternative to a local stock exchange, companies can attract foreign capital either by cross-listing their shares in a foreign exchange or listing the shares solely on a foreign exchange. Small and medium-sized companies are at a disadvantage when it comes to raising financing, especially from foreign sources. Their visibility to investors is low, and they have limited resources for finding capital. Therefore, it is in their interest to have either good domestic capital availability or an easy way to raise foreign capital.

For the third sub-problem I focus on a particular stock exchange in central Europe that was set up to take advantage of the changing regulations that were created to catalyze a common market. EASDAQ was the first exchange project in the 1990s to take direct advantage of the European Union Investment Services Directive. It also claimed to be the first pan-European exchange, an exchange that was supposed to have no particular home country but served all investors as if they were foreign (or domestic, as you like). I study *how liquidity of shares was offered to foreign investors on EASDAQ and how it developed compared to other exchanges*. This exchange was the ignition to a movement that resulted in the launch of several new market initiatives, such as the German Neuer Markt, the French Nouveau Marché, and Spain's Nuevo Mercado. Most of these initiatives later suffered from low trading volumes as the stock prices declined and, along with EASDAQ itself, faced shutdown. Their short history, however, provides fertile ground for research on what the determinants of success and failure are.

Finally, the last sub-problem involves the impact of regulation on domestic investors during a time of change. I study *whether the regulatory measures taken in certain*

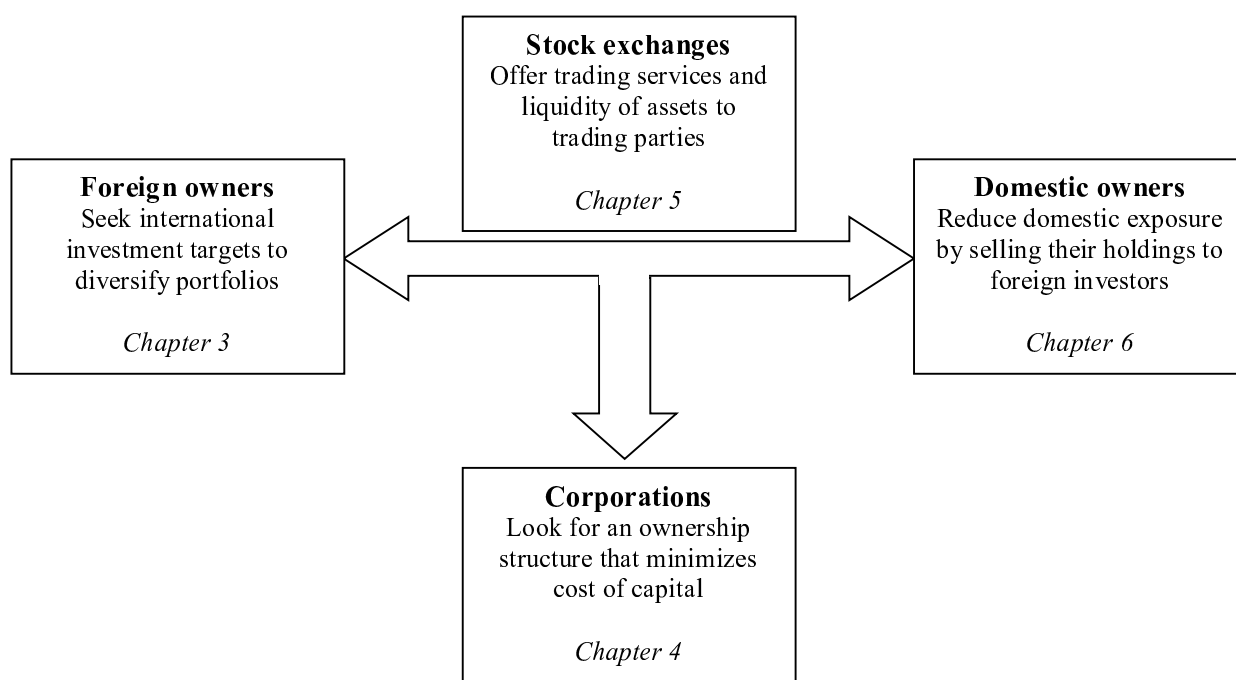
countries to control and monitor foreign ownership create a possibility for constructing a profitable trading strategy for domestic investors. Restrictions, regulations, and especially taxation can create anomalies in capital markets and may offer excess returns to certain investor groups. But monitoring of a regulation-free market may have a similar effect, since it creates extra information. While foreign ownership of domestic enterprises has become unfettered to a large extent in Europe, some countries have adopted a policy of actively monitoring how foreign ownership has developed in domestic enterprises. Such monitoring data could contain information that may be beneficial for certain investors and distort the market. Benchmarking and matching the actions of foreign professionals could offer a vehicle for increasing the interest of domestic investors in equity investment and improve the availability of domestic capital.

1.3 Structure of the Dissertation and Research Methods

The thesis comprises four related studies that offer answers to the four sub-problems. The first study, covered in Chapter 3, examines the preferences of foreign investors as they seek cross-border investments in national exchanges. The findings concerning preferences help companies understand whether they can attract foreign financing. The results also provide policymakers with information on what drives cross-border ownership and offer exchanges the understanding needed in creating lucrative trading arenas in a unified market. The second study, addressed in Chapter 4, looks at how firms have taken the opportunity to proactively seek a new foreign investor base. This is, in a sense, the flip side of the first study and explains what actions companies have taken to further the integration by actively finding foreign investors. The third study, documented in Chapter

5, analyses how a stock exchange may take the opportunity to create new offerings to the integrating market. Cross-border investments play a key role here as well, because everyone is a foreigner in such an exchange, with no particular home country. Finally, the fourth study, covered in Chapter 6, analyses whether domestic investors can benefit from the actions of foreign investors by tracking the actions of foreign professionals.

Figure 1.1 Contextual structure of the dissertation



To perform the empirical work required in studying each view, I collect three research databases comprising accounting, trading, and ownership data of European companies. These databases span a decade of active investment and are unique in terms of their content. Various regression models, explained in detail later on, are then used to test the research hypotheses built on previous research findings.

In the first study, I measure foreign investor preferences by looking at which firms foreign investors overweight compared to domestic investors in two national exchanges, the Oslo Stock Exchange and Helsinki Stock Exchange. By applying a multiple regression model to eight years of unique monthly panel data, I extract the determinants of high and low foreign ownership.

In the second study, I use an extensive data set comprising ownership and firm characteristic data from multiple European initial public offerings. A regression model is then built to measure the characteristics of those firms that have pursued a foreign offering as opposed to those that have not.

The third study is a case study of the pan-European exchange EASDAQ. In the study, the liquidity of EASDAQ-listed companies is compared via a time-series regression model against the liquidity measures of similar companies in other exchanges throughout the history of EASDAQ. The results show whether differences in liquidity can be attributed to the exchange or individual characteristics of the companies.

The final study uses comparative data from the Helsinki Stock Exchange and Oslo Stock Exchange to create portfolios that track the different levels of foreign ownership. Returns of the portfolios are regressed against factors of well-known risk models. Regressions

show whether such portfolios result in excess returns that are not explained by generally accepted risk factors.

2 OVERVIEW OF PREVIOUS RESEARCH AND THEORETICAL FRAMEWORK

The general framework for the studies dealt within this dissertation can be derived from capital market theory. As the chapters of this dissertation take different views on the research topic, the dissertation also touches several different, intertwining streams of capital market research. These streams can be classified in the context of this dissertation into the following three categories.

- Investor behavior in global capital markets and especially the anomalies associated with imperfect allocation of capital in investment portfolios and the so-called home bias.
- Market microstructure and trading on stock exchanges, with emphasis on the creation of liquidity in the markets.
- Seeking listings, issuing shares, and raising capital from domestic and foreign equity markets.

Each chapter in the dissertation contains a section on research relevant to the case at hand and develops research hypotheses based thereon. The overview below offers a short summary of the most relevant research streams. Each chapter provides a more complete discussion of the theories as outlined above.

2.1 Asset Allocation and Home Bias

Allocation of assets into investment portfolios and the correlation of returns on portfolios form the basis of modern thinking about investment risk and return, the core drivers of investor behavior. The measurement of risk stems from the original ideas of Markowitz's (1952) portfolio theory, which allowed the creation of models offering tools for the calculation of cost of capital. Such models include, for example, the Capital Asset Pricing Model (CAPM) (Treynor 1961, Sharpe 1964, Lintner 1965) and Arbitrage Pricing Theory (APT) (Ross 1976). These models assume that investors optimize the risk/return profile of their investment portfolios by diversifying across firms, industries, and national economies. But, in reality, diversification – especially international diversification – is very limited, even among professional investors.

The behavior where investors do not make foreign investments in an optimal fashion but overweight domestic shares is called home bias. The original explanations of this phenomenon were made in the 1970s as extensions to the market equilibrium models (Black 1974, extensions to the model in Stulz 1981). Originally, the explanation for the phenomenon was assumed to be restrictions to international capital flows and costs associated with foreign trading such as taxes and transaction costs. Later studies on home bias have generally fallen into two categories: those focusing on institutional factors and those focusing on investor behavior (French and Poterba 1991). A potential reason could be the desire to hedge against domestic inflation due to deviations from purchasing power parity (Cooper and Kaplanis 1994). But empirical evidence casts doubt on the true impact of transaction costs, investment restrictions and inflation hedging (Uppal 1992). For instance, Tesar and Werner (1995) show that turnover rates in foreign portfolios are higher

than those of domestic portfolios, in the face of which the assumption that high transaction costs limit trade within foreign portfolios appears quite illogical. Similarly, Uppal (1993) builds a model in which investors are constrained to consume only from their domestic capital stock and have proportional costs of transferring capital across countries. Uppal argues that in such a situation investors should actually have a preference for foreign assets.

While tangible restrictions to capital flows do not seem to have more than a limited effect, the availability and quality of information clearly do. Zhou (1998) argues that information asymmetry could be an explanation. Investors are simply overweighting shares that they are better aware of and therefore focus on the local market. Keloharju and Grinblatt (2001) support this argument by showing in their study of Finnish stocks that investors are more likely to hold, buy, and sell 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. Strong and Xu (2002) offer also a modification to the information asymmetry theory by arguing that fund managers in general are more optimistic about domestic shares, which leads to an overweight.

The actual impact of home bias has also been under active scrutiny. Of particular interest has been the matter of cross-border equity flows and what happens to the cost of capital if companies can overcome the problems of segmented markets caused by home bias. This research indicates that the cost of capital for companies decreases as borders open. For instance, Miller (1999), Foerster and Karolyi (1993), Karolyi (1996), and Foerster and Karolyi (1999) measure changes in the cost of capital at cross-listings. These studies show

that after a cross-listing risk premiums have decreased and trading volume has increased. The cross-listings have created value by removing limitations to investment.

The academic community has also tried to model the expected magnitude of investment capital flows between markets. A model called the “gravity model” has been used in several studies in explaining the direction and volume of cross-border transactions (Ghosh and Wolf 1999, De Ménil 1999, Keloharju and Grinblatt 2001, Portes and Rey 2002). The gravity model, which originates from trade of goods, models flows as a function of distance and “mass” (typically GDP). Empirical data shows that the gravity model seems to hold – the greater the distance between two markets, the smaller the capital flow between them (see, e.g., Portes and Rey 2002). Empirical evidence also indicates that capital flows are affected as well by the preferences of investors for certain industries and firm characteristics. This results in a situation where some companies on a domestic market find it easy to attract foreign interest while others are fully domestically owned. For example, Kang and Stulz (1997) study foreign ownership of Japanese companies and find that foreign investors prefer shares of firms in manufacturing industries and systematically underweight the Japanese services and utilities sectors. Dahlquist and Robertsson (2001b) study the ownership of Swedish listed firms and find the data to indicate a preference for firms that have strong exports. They also argue that foreign investors prefer firms that have large cash positions and pay low dividends.

2.2 Stock Exchanges and Market Microstructure

While behavioral models show why capital is allocated on a macro scale, trading and market microstructure theories model how assets change ownership in practice in different

trading locations, most notably stock exchanges. The core service stock exchanges provide liquidity for tradable assets. Market microstructure is a research stream that studies how this liquidity develops in an exchange and how prices are formed through trading mechanisms. While market microstructure theories are traditionally kept separate from asset pricing research – due to the assumption that large markets are so liquid that the effect of limited liquidity can be discounted – in studies of small national markets, for an international context it may be necessary to incorporate elements of both. For an institutional investor the limited liquidity of a small national market may be a hindrance that forms a risk factor of its own and has a separate premium that is factored into the asset prices.

Some of the key elements of market microstructure are the dynamics of share prices (e.g., Cochrane 2001; Merton 1980; Sargent 1979; Ansley, Spivey, and Wroblewski 1977), the behavior of dealers and the setting of bid and ask prices in different trading arrangements (e.g., Roll 1984, Kyle 1985, Glosten and Milgrom 1985, Admati and Pfleiderer 1988, Holden and Subrahmanyam 1994, Foster and Viswanathan 1990, Huang and Stoll 1997), and the relationship between liquidity and asset prices (e.g., Amihud and Mendelson 1986; Datar, Naik, and Radcliffe 1998). For a good overview of market microstructure, see O'Hara (1995).

Questions of trading liquidity are bound to international trade not only because of differences in liquidity between national markets but also because international trade affects the dynamics of stock exchanges. If investors diversify internationally and friction in capital movement across borders eases, this creates competition between national stock exchanges. If economies of scale give an advantage to larger entities, this potentially leads

to mergers of exchanges. Whether trading should take place in one merged venue or several is a question that has been studied extensively but with limited final conclusions.

The first models for how and why trading would cluster in a single location date from the 1960s. Stigler (1961, 1964) shows how economies of scale in information processing favor large entities. Other studies of the same era show that exchange operations (Doede 1967) and market-making (Demsetz 1968) also experience economies of scale that are in the favor of large operators. A single, monopolistic exchange would be a preferred option, for economies of scale should push the trading and settlement costs down and trading parties should find each other easily from a single place. Consequently, Malkamäki and Topi (1999) predict that economies of scale, along with scope and network effects, will drive the industry towards integration on a global scale. On the other hand, in a monopolistic situation the monopolist should be able to increase trading prices and limit the attention many listed companies get. For example, Arnold et al. (1999) study mergers of regional exchanges in the United States. They find that those mergers resulted in lower trading costs for investors but attribute this effect to improved competition between the newly merged exchanges.

Further drivers of consolidation include changes in regulation and advances in technology. While it seems that a large number of factors can act as enablers of consolidation, regulatory shifts have a significant effect that gives the “final thrust” to the development (Stigler 1964, Simon 1989). When controls on capital flows are changed, capital quickly finds ways to take advantage of the change. Electronic trading over the Internet or other networks on the other hand has become an important tool for investors and has also opened new opportunities for cross-border trading. For instance, Pirrong (1999) argues

that recent advances in communications technology have served to minimize the fragmenting effect of physical distance on exchange formation. But one should not over-exaggerate the effect of electronic trading, especially when it comes to cross-border mergers. Telecommunications technology was cited as a driver for consolidation in the United States as early as 1944 (Cole 1944). But it has not created any large mergers of exchanges across national borders, despite the fact that modern telecommunications networks reach every corner of the world. From a purely technological point of view, calling a trader who sits in New York from Paris is as easy as calling him from San Francisco. Still, this has not created any cross-Atlantic mergers, even though capital flows between, for instance, Europe and the United States are nowadays significantly larger than they were 60 years ago.

If consolidation takes place, who succeeds in it? Hasan and Malkamäki (2000) show in their paper that exchanges in North America have the largest economies of scale, with European exchanges coming second and Asian exchanges trailing behind. North American exchanges should therefore be strong also in the merger game. Hasan and Malkamäki also find that economies of scale are larger in those areas with the most unified regulation. A second important factor is foreign investment flows. Pagano et al. (2000) predict that those exchanges that can attract foreign listings and can thus become more international will be strongest in the development of integration. This seems to be primarily a game of cost. Pagano, Röell, and Zechner (1999) find that in Europe the exchanges with the highest trading costs are the ones that have the largest net outflow of cross-listings.

Whether stock exchange mergers are to the benefit of economies as a whole is a separate question. The importance of stock exchanges to a national economy has been studied

extensively (see, e.g., King and Levine 1993; Levine and Zervos 1998; and Beck, Levine, and Loayza 2001). The results are quite unanimous; the existence of a stock exchange increases the growth rate of an economy. A well-functioning stock exchange provides a direct channel for financing and also creates spillover effects for other forms of financing. For instance, venture capital requires public markets with relatively predictable IPO activity in order for there to be access to an exit method (Ali-Yrkkö, Hyytinen, and Liukkonen 2003; Niemi 2003). A stock exchange is a direct source of trading for public companies and an indirect source for private companies.

2.3 Raising Capital and Listing Shares on Stock Exchanges

While the needs and preferences of investors are key in understanding how and why cross-border investments are made, one should not neglect companies themselves as active parties in the market. Companies try to actively mold their ownership structure through merger and acquisition activity and by making directed offerings and listings for foreign equity markets. The motivations behind the offerings determine when and where capital is raised and how large a part of the company becomes a freely tradable asset, and in which market. New offerings also feed the financial market and its intermediaries like stock exchanges with new tradable assets to keep the market alive and vibrant.

Raising of capital through initial public offerings has received plenty of academic attention. Traditionally of specific interest to the academic community have been the underpricing of IPOs (e.g., Rock 1986; Ritter 1987; Welch 1989; Carter and Manaster 1990; Aggarwal and Rivoli 1991; Welch 1992; Drake and Vetsuypens 1993; Keloharju 1993; Loughran, Ritter, and Rydqvist 1994; Franks and Brenna 1997; Ljungqvist,

Jenkinson, and Wilhelm 2000a; Ljungqvist, Jenkinson, and Wilhelm 2000b) and the long-run underperformance of new issues (e.g., Ritter 1991, Levis 1993, Loughran and Ritter 1995, Brav and Gompers 1997, Rajan and Servaes 1997). With these studies having revealed that IPOs experience certain phenomena, matters such as allocation and regulation, as well as control of offerings after issue (in forms such as lock-ups), have become topical (e.g., Keloharju 1993; Teoh, Welch, and Wong 1998; Brav and Gompers 1999; Field and Hanka 1999; Blass and Yafeh 2001; Ljungqvist and Wilhelm 2001; Aggarwal, Krigman, and Womack 2001). For a good summary of different selling and allocation mechanisms used in IPOs, see, for example, Biais and Faugeron-Crouzet (2000).

Initial public offerings in foreign markets can be roughly grouped into three categories: 1) direct foreign initial offerings where the foreign exchange is the first public listing for the company; 2) multi-listings where the company makes its initial offering to multiple markets, one of them typically being in its home country; and 3) cross-listings where the company has already been listed in one exchange and seeks another listing, in a foreign market. Direct foreign initial offerings have emerged as a new stream of research in recent years, and not much published research exists yet (see, e.g., Ejara, Ghosh, and Nunn 1999 and also Kadiyala and Subrahmanyam 2002). By contrast, cross-listings and multi-listings have received more attention (e.g., Saudagaran and Biddle 1992, Kadlec and MacConnell 1994, Karolyi 1996, Foerster and Karolyi 1999, Miller 1999). This may partly stem from data availability. In cross-listing situations, public data on share performance, trading, and financial status is readily available both before and after the listing so it is relatively straightforward to make pre- and post-event comparisons.

For better understanding foreign initial public offerings, general studies of IPO motivation offer one framework. Such motivational studies range from theoretical modeling of motives (e.g., Chemmanur and Fulghieri 1999) to empirical surveys (e.g., Mittoo 1992, Leleux and Muzyka 2000). Reasons for IPOs that have been cited in the previous literature can be roughly categorized into four groups of reasons, relating to:

- (1) capital availability and exit (e.g., Pagano, Panetta, and Zingales 1998);
- (2) widening of the shareholder base and obtaining and controlling of liquidity (e.g., Foerster and Karolyi 1999);
- (3) signaling of quality (e.g., Blass and Yafeh 2001); and
- (4) spillover effects such as corporate image and personnel incentive schemes (e.g., Modén and Oxelheim 1997).

The need for capital on the company's part and the desire of owners to sell shares are core motivations that are easy to understand. However, a listing brings benefits that may be sufficient for a listing even when raising capital or selling shares are not so much the issue. A listing brings prestige that may be beneficial for business. It indicates quality and the ability to conform to the regulations applying to public companies. It brings liquidity to shares, which is appreciated not only by the main shareholders but also by potential acquisition targets and personnel under option schemes. In a study by Holmén and Högfeldt (1999), implementing efficient personnel incentive programs was the second most frequent motive for IPOs in Sweden.

Finally, when studying IPOs with any time series, as is done in this dissertation, one must take into account the cyclical nature of IPO activity (Ritter 1984). As IPOs are inherently risky investments, they are most likely to succeed in periods when investors are willing to take risks. And this happens on a large scale only when company valuations in general are high. Ritter argues that firms tend to go to the market when there is an increase (a shock) in the productivity of a certain industry or an inflated expectation of such a shock. Lerner (1994) confirms this in his study of venture-backed biotechnology companies and shows that venture capitalists are able to systematically predict and utilize hot periods for exit. To cite another example, Pagano, Panetta, and Zingales (1998) show in their study of the Italian stock market that companies are more likely to go public when the industry in general is highly valued. As a result, IPOs happen in “waves.”

3 FOREIGN INVESTOR PREFERENCES AND INVESTMENT PATTERNS

3.1 Introduction

Some fifteen years ago, the operating environment was quite different for many European investors who sought to broaden their investment portfolio. Countries enforced strict restrictions on export of capital. Foreign ownership of shares was either totally prohibited or restricted to shares with no voting rights. Since then major changes have taken place, and investors now invest in markets near and far with the help of modern information technology.

Across Europe, the European Union and its predecessors have been a major actor in removing restrictions on foreign investment. For example, in the Nordic region, the geographic area this chapter focuses on, ownership restrictions started loosening in the early '80s. In 1993, restriction of foreign ownership was completely abolished in Sweden, Finland, and Norway (see, e.g., Oxelheim et al. 1998).

The European Union has taken important steps to unify investment protection within the union and abolished barriers to cross-border investment flows. The Financial Services Action Plan (European Commission 1999) outlines the key steps to be taken in order to unify the financial services market and open borders within Europe. These include, among others, 1) common rules for securities and derivatives markets to make provisioning of cross-border investment services more efficient; 2) unified ways to raise capital on an EU-wide basis to enable improved access to capital, including risk capital; 3) unified financial

reporting (the adoption of International Accounting Standard) to improve the availability and comparability of financial statements from companies; 4) unification of corporate governance arrangements to protect the investors; and 5) improved access to financial services across borders, including the distance selling of financial services.

If these measures are successful, Europe should see a large difference in how corporate ownership is spread across the borders of the member states. But regulatory changes are not sufficient unless cross-border investment is seen as lucrative by investors.

The preference of foreign investors is the subject of this chapter. It explores the development of two small national exchanges: the Oslo Stock Exchange in Norway and the Helsinki Stock Exchange in Finland. Both exchanges operate in the Nordic region and in similar economic settings, with a similar legal framework and an economy of quite similar size. However, Helsinki is located within the European Monetary Union and Oslo is not. Also, the drivers of the economies differ. The comparison therefore can provide important insights into how foreigners see firms within these economies and how that affects their behavior.

This study is presented as follows. Section 3.2 provides a brief introduction to the economies and the two exchanges. Then, Section 3.3 introduces previous research in the area and builds the research hypotheses. Section 3.4 describes the methodology and the data set. The results are presented in Section 3.5, and Section 3.6 summarizes the findings.

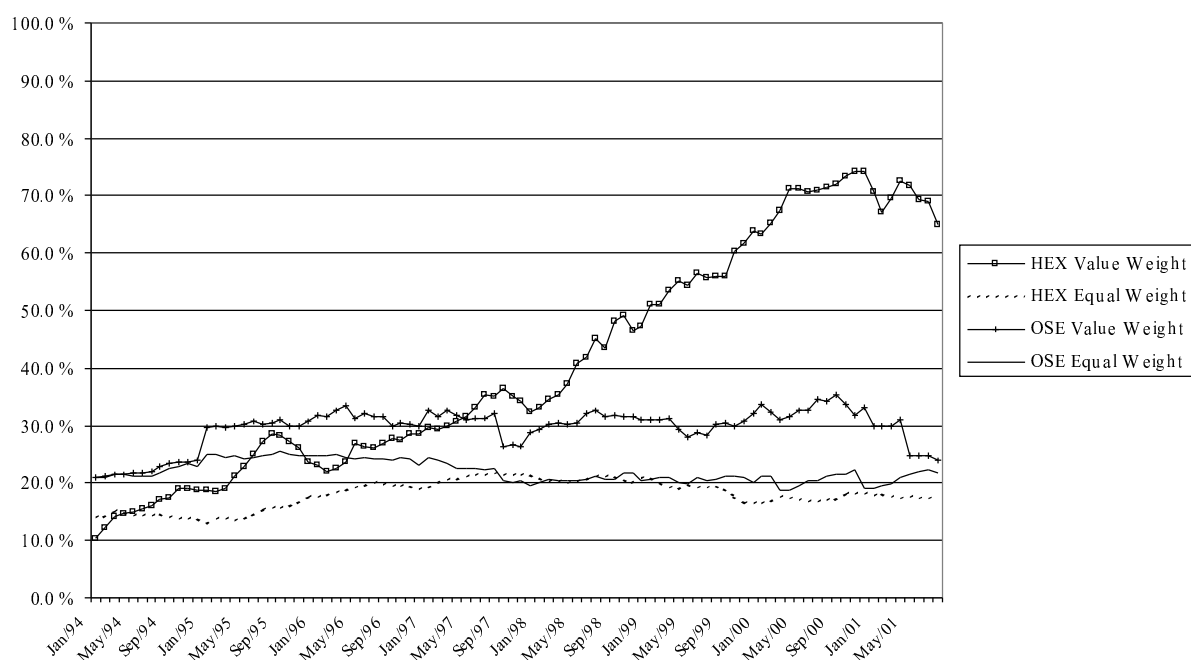
3.2 Background on the Economies and Stock Exchanges under Comparison

The two exchanges chosen offer a good comparison of foreign investor preferences for several reasons. First, the two have a very similar history in terms of regulation of foreign ownership. Both Norway and Finland loosened restriction acts that limited foreign ownership in the 1980s, and both countries removed all limitations in 1993 (Modén and Oxelheim 1998). Also, both exchanges are relatively small and specialized, and they can be considered to operate in a legally and politically similar environment. What makes the comparison interesting is that the exchanges reflect specialization in very different industries. Norway has strong oil and shipping industries, while Finland is a country of electronics and pulp and paper. The economies experience different cycles, which is likely to result in differing investor appeal over time. Oil and transportation are, most of the time, relatively stable, defensive industries, while electronics and paper are both very cyclical. Additionally, and to researchers' benefit, the two countries offer research data of similar accuracy. The data is unique; no other countries record foreign ownership as accurately as these two.

Figure 3.1 shows equal-weight and value-weighted average foreign ownership percentages for both exchanges. As can be seen, the average equal-weight foreign ownership percentage has been relatively flat: 20% in both countries, with Norway historically having somewhat higher foreign ownership. What is noteworthy, however, is the radical change in value-weighted foreign ownership in Finland. Foreigners invested heavily in telecommunications companies, especially the mobile phone maker Nokia, in the early and mid-1990s. The rapid upswing in asset valuations in this industry resulted in foreigners

owning a clear majority of the market value in Helsinki. In Oslo as well, foreigners own higher stakes in the more valuable companies, but the difference is not nearly as pronounced as in Helsinki.

Figure 3.1 *Equal-weight and value-weighted average foreign ownership in the Oslo Stock Exchange and Helsinki Stock Exchange from January 1994 to September 2001*



Norway – Oslo Stock Exchange

Norway is a constitutional monarchy that had a population of 4.5 million people on December 31, 2001. A significant share of the economy is made up of service industries, including wholesale and retail trade, banking, insurance, engineering, transport and communications, and public services. In 2001, the service sector as a whole accounted for approximately 54% of the country’s GDP. Norway’s petroleum industries, including crude oil and gas extraction, accounted for approximately 22% of GDP and about 44% of

exports in 2001. The GDP grew at a rate of approximately 4.0% each year during the '90s. The early part of the decade was a time of economic recovery. The recovery started to slow down in 1997, and the Norwegian market underperformed its Nordic neighbors in both 1998 and 1999. Inflation was 2.5 to 3.0% per annum in the 1990s, while the unemployment rate has remained low, at about 3%. The currency, the Norwegian Krone (NOK), which remained relatively stable against the euro (or ECU) during the time studied. The NOK depreciated a total of 5.5% between January 1, 1994, and November 11, 2001.

The national, and only, stock exchange is the Oslo Stock Exchange (OSE). This is a non-profit institution, financed through fees from listed companies and broker members. The exchange is supervised by the Norwegian Ministry of Finance but governed by the Stock Exchange Council. The OSE was founded in 1819 and operated solely as a foreign exchange market until commodities trading was introduced in 1850. The market for share and bond trading did not begin until 1881. Norway's three stock exchanges (Bergen, Trondheim, and Oslo) formally merged on January 1, 1991. From that date, the exchanges in Bergen and Trondheim were branches of the OSE. Today the OSE comprises an equity, bond, and derivatives market. It is a member of the Norex alliance of Nordic exchanges and has adopted the same trading system as exchanges in Stockholm (Sweden) and Copenhagen (Denmark) have.

There are no rules restricting foreigners from acquiring shares in Norwegian companies. Governmental approval is, however, required for buying more than one third of the voting share capital when the target company has annual turnover in excess of NOK 50 million, employs more than 50 people, or has received state aid of NOK 5 million for at least one

specific research and development project in the previous eight years. Dividends paid to non-resident shareholders in Norwegian companies are subject to a withholding tax of 25%. This rate may be reduced under the terms of a tax treaty between Norway and the shareholder's country of residence.

Finland – Helsinki Stock Exchange

In terms of population, Finland is very similar to Norway. The population of Finland was 5.1 million on December 31, 2001. Legislative power in Finland is exercised by a 200-member parliament and by the President of the Republic. Finland is a member of the European Union and the European Monetary Union. Monetary policy decisions are made at the European Central Bank, and the currency is the euro.

After a recession hit hard at the beginning of the 1990s, the Finnish economy grew at an average rate of 4.5% a year. Unemployment peaked at 20% in 1994, after which the employment situation improved, although the unemployment rate remained at over 10% throughout the 1990s. Finland is strong in the forest industry and regarded as one of the main areas of innovation in wireless communications. Like Norway, Finland is a very open economy, with exports accounting for 40% of GDP. Inflation remained below 2.0% for most of the '90s.

The Helsinki Stock Exchange (HEX) is the national, and only, stock exchange. It operated as a free-form association from its establishment in 1912 up until 1984, when it was turned into a non-profit cooperative. In 1995, the cooperative was converted into a limited company. On April 1, 1999, following a reorganization, the new consolidated HEX Group was established. From then on, HEX expanded aggressively in the Baltic countries. In

February 2001, HEX bought the majority of Estonia's Tallinn Stock Exchange, and HEX also bought the majority of the Riga Stock Exchange in Latvia, in 2002. In 2003, HEX merged with OM, the Swedish company that runs the Stockholm Stock Exchange. Despite the organizational merger, the Finnish, Swedish, and Baltic markets still operate in a very nationally oriented manner within the new OMHEX entity.

The Helsinki Stock Exchange is an extreme example of foreign ownership; foreign ownership is not as high in any other European exchange as it is in Helsinki (Puttonen 2004). The shift from domestically owned to internationally owned market has been rapid. Once Finland lifted restrictions on foreign ownership in 1993, total foreign ownership surged from a bit less than 10% to the current level, which averages at 70%¹. In other European exchanges, corresponding numbers are much smaller: 15% for Milan, 20% for Frankfurt, 33% for London, 34% for Oslo, 35% for Madrid, 37% for Paris, and 38% for Stockholm (FESE 2002). There are no limitations for foreigners owning Finnish shares. For non-resident investors, the 29% withholding tax applied to dividend income is, in most cases, reduced by the bilateral tax conventions signed by Finland. As a rule, non-residents are individuals who do not engage in business or trade through a permanent establishment of fixed base in Finland.

¹ Source: Research Institute of the Finnish Economy.

3.3 Theoretical Background and Hypotheses

There is a fairly limited amount of published research on cross-border equity ownership and its determinants, probably because accurate data is difficult to obtain. The existing research can be divided into roughly three interlinked streams: 1) international diversification and home bias, 2) investment preferences and determinants of foreign ownership, and 3) trading behavior of foreign investors. This section of the dissertation reviews the existing literature and builds hypotheses based on previous relevant theories and findings.

All of the streams of existing research have ties to the so-called behavioral finance (see e.g. Shefrin 2002). Behavioral finance is primarily concerned with the rationality, or lack thereof, of economic agents. Thus by design, behavioral finance seeks deviations from generally accepted econometric models, which has sometimes led to the criticism of behavioral finance being not much more than a result of data mining. While taking the risk of falling under the same criticism as all studies in this field, this paper honors the approach of behavioral finance and similar previous studies and takes as a starting point the findings of previous anomalies rather than econometric modeling. It builds hypotheses primarily based on the findings.

Preferences relating to information asymmetry and knowledge of shares

Of the three streams, home bias – i.e., the reasons for which investors diversify internationally less than is expected under most financial theories – has the longest history and largest number of published papers (see, e.g., French and Poterba 1991, Cooper and Kaplanis 1994, Tesar and Werner 1995, and Kang and Stulz 1997). Researchers attribute

home bias to four main factors (Kang and Stulz 1997), these being 1) explicit barriers to international investment, such as taxation (mainly loss of tax benefits) or direct restrictions on foreign holdings; 2) implicit barriers such as political differences between countries and information asymmetry; 3) departures from mean-variance optimization of a pure share portfolio (i.e., investors might want to hold a portfolio that is hedged against unanticipated changes in the purchasing power of their currency); and 4) information asymmetry (i.e., investors not knowing enough about investment opportunities abroad and thus avoiding them). No one has so far succeeded in providing one generally accepted explanation for home bias (Dahlquist et al. 2003). Still, most researchers support information asymmetry as the main reason for home bias. Foreign investments simply do not flow into companies that investors do not know very well.

If information asymmetry is a major hindrance to foreign investment, foreign investors should prefer large firms when making investments. This is because large firms are more likely to be better known abroad, due to their business activities and because there are more analysts that cover them, improving availability of investment reports. Most explicit barriers to investment (e.g., global fund rules) are also mostly tied to market capitalization. Funds may typically invest in only companies above a certain threshold in size or firms that are part of a major index. Being part of the index improves visibility. In some cases, it makes the tracking of asset manager actions easier because the comparative index is easy to define. Only large enough firms are therefore qualified for investment by foreign funds. Cardwell (1997) finds in his study of foreign investor preference in Finland in 1993–1996 that foreign ownership is correlated with size (sales, book value, number of personnel) but that this connection has decreased over time. I, therefore, hypothesize as follows.

Hypothesis H1 All else equal, foreign investors prefer large companies.

Apart from pure size, other factors may affect investor knowledge. General knowledge of the operations of a specific company can also be derived from the industry a company is engaged in. If a certain industry forms a large part of the economy of the country, this is generally known abroad. Foreigners should know Finnish telecom companies and Norwegian shipping companies better than other companies in these countries. Foreign investors have been found to overweight certain industries because of “cherry-picking” behavior – i.e., they can diversify a global portfolio just by picking companies from certain industries. Previous empirical evidence supports this reasoning. For instance, Kang and Stulz (1997) study foreign ownership of Japanese companies between 1975 and 1991. They find that foreign investors prefer shares of firms in manufacturing industries and systematically underweight Japanese services and utilities sectors. This forms the basis for the next hypothesis.

Hypothesis H2 All else equal, foreign investors prefer those shares for which the national exchange is known.

If investors exhibit home bias, most of their attention is on local exchanges. If a foreign firm has taken a proactive role and cross-listed its shares on such a local exchange for these foreign investors, the firm should then be better known. Through cross-listing, the firm should also avoid the explicit limitations of investing in financial instruments on foreign markets because local exchange regulations must be obeyed. Again, there is previous empirical evidence on the phenomenon. Kang and Stulz (1997) find that Japanese

firms that have an ADR program have higher foreign ownership. This leads to the following hypothesis.

Hypothesis H3 All else equal, foreign investors prefer companies that have cross-listed their shares abroad.

Preferences related to firm quality

According to financial theories, the main driver behind foreign financial investment should be international diversification. However, diversification, by nature, requires larger portfolios, which in turn leads to less time spent analyzing each individual company. If so, foreigners should be less likely to “speculate” on shares and prefer to avoid risk by investing in firms that are considered “safe,” compensating for the possible lack of local knowledge. The old asset manager’s principle “you cannot get fired for investing in IBM” could also guide foreign investments. Safe firms should be those that are large, those whose accounting figures do not look risky, and those that produce a good return on equity. Alongside industry preferences, foreigners should be aware of basic accounting ratios of investment targets prior to investment. Previous findings seem to support this logic. For instance, Kang and Stulz (1997) report foreign investor preference for firms with good accounting performance. In this study, return on equity should offer a good general proxy for accounting performance.

Hypothesis H4 All else equal, foreign investors prefer companies with high book return (i.e., return on equity).

Following the logic of making investments in safe firms, a second basic accounting figure is cash. The investment target should not be in a situation where it runs into risk because

of lack of cash. Indications of this can be found in the work of, e.g., Dahlquist and Robertsson (2001a). Dahlquist and Robertsson study ownership of Swedish publicly listed firms between 1991 and 1997 and find that foreign investors prefer firms that have large cash positions and that pay low dividends. Cash as such is a difficult measurement to employ, since firms of different sizes and risk profiles have different cash needs. However, relative measurements such as quick ratio and current ratio should give a more accurate picture of the risk level of the firm. Quick ratio and current ratio are linked and correlated by definition, so one cannot use both. In terms of operations, it is easier to obtain a good current ratio than a good quick ratio (quick ratio requires receivables to be converted into actual cash) and cash has previously been found to be a preference. Therefore, quick ratio is used in this study as the chosen variable.

Hypothesis H5 All else equal, foreign investors prefer companies that have a high quick ratio.

Preferences related to liquidity and share price performance

Finally, trading issues such as liquidity, trading strategy, and share price performance should affect investor behavior. Dahlquist and Robertsson (2001a) report that foreign investors prefer liquid firms and avoid those with high concentrated ownership. Measuring the effect of both liquidity and ownership concentration simultaneously may be difficult because ownership concentration correlates strongly with liquidity (see Chapter 5). However, liquidity (measured via turnover of shares) does have a meaning for foreign fund managers. Foreign investors are typically large funds (Grinblatt and Keloharju 2000). In order to be able to invest large sums, they need a certain amount of trading activity to

be present; otherwise, making the investment without adversely disturbing the market may be difficult. Investment protection is another reason, The funds may from time to time need to transform the shares into cash, which requires constant turnover. Therefore, I hypothesize as follows.

Hypothesis H6 All else equal, foreign investors prefer companies with high liquidity.

Several studies (Karolyi 1999; Kim and Wei 2002; Froot, O'Connell, and Seasholes 2001; Grinblatt and Keloharju 2000; Seasholes 2000; Dahlquist and Robertsson 2001b) have shown that international flows are strongly affected by past returns. Thus, foreign investors act mostly like non-informed momentum traders. Kim and Wei (2002) study how foreign investors behaved in Korea during a currency crisis. They find strong evidence of herd behavior among foreign investors. However, those institutions that had a local presence in Korea during a crisis show less such behavior. If information is limited, the easiest way to make investments is to do less analysis and allocate money to markets that are performing well, in hopes that they continue to do so. "Herding" may also be caused by the nature of the investors. Money flows into mutual funds with a delay, causing a flow of capital that increases share prices if the demand/supply imbalance replaces the fundamentals of the market in pricing. Past performance of industries or general indices may therefore also be a determinant of foreign investor preference.

Hypothesis H7 All else equal, foreign investors prefer shares that have performed well in the past.

Alongside size, liquidity, industry, momentum, and accounting performance, there may also be further preferences of foreign investors related to well-known trading strategies such as value investing or growth investing (see, e.g., Fama and French 1993). However, there is no dominant logic explaining why one investment strategy should prevail over another. Some foreign investors may be growth investors, others value investors, and the data shows the proportions of these styles. If the majority of foreign investors are value investors, they would buy low book-to-market shares. If the majority of foreign investors are “bargain hunters,” they should overweight, for instance, low PE shares. To check whether such variables could have an effect, descriptive data related to these phenomena, such as PE ratios and book-to-market ratios, is collected, summarized, and shown below. Since there is no clear logic indicating what the preference may be, the variables are omitted from regression equations, however. There is also known correlation between the variables. For instance, companies with good returns also tend to have a high PE.

3.4 Methods and Data

3.4.1 Data Sources

In contrast to previous studies of direct foreign ownership that are limited to annual data for a single exchange (Kang and Stulz 1997, Dahlquist and Robertsson 2001a), this study uses monthly comparative data on foreign ownership from two exchanges. Monthly data provides a chance to see in higher granularity how foreign ownership may change over time depending on firm and market performance. High granularity may be especially useful if there have been large changes in either the exchange and its performance or

regulatory controls. The years studied include some exciting times for the stock markets, especially in Helsinki, mainly due to the “technology bubble” in 1998, 1999, and 2000. In 1999, the Helsinki Stock Exchange was the best performing exchange in the world, when measured in terms of the market index return. In 2000, it was the worst performing. These radical changes in market values, and perhaps even an irrational flow of capital to the market, allows one to study how foreign investors reacted to the volatility in the market. The Oslo Stock Exchange allows for good comparison since the OSE index was much less volatile during the bubble years but has experienced almost exactly the same changes in the regulatory environment.

Ownership data is obtained from the central securities depositories in Norway and Finland. In Norway, this is the Norwegian Central Securities Depository (VPS), and it is the Finnish Central Securities Depository (APK) in Finland. These depositories operate in a similar manner in terms of recording ownership. All domestic owners must register at the depository and be identifiable, even if shares are held in a custody account. Because of this procedure, all shares whose owners are not identifiable in this manner must be held by foreign investors. Market values, trading volume, returns (including dividends), and index performance numbers are obtained from Thomson Financial’s Datastream. Accounting data for Finnish companies is from Suomen Asiakastieto Oy, while Oslo Børs Informasjon (OBI) supplied the Norwegian accounting data. All monetary values are converted to euros at the rate prevailing on the date the information is from. A synthetic rate supplied by Thomson Financial is used for the time when the euro was not yet a denoted official currency.

Banks, insurance companies, and real-estate funds or investment firms have been removed from the database material. This is because their operations and accounting policies differ fundamentally from those of other listed companies. Also, there was plenty of consolidation in the banking sector in the Nordic countries during the 1990s, involving companies from Finland, Denmark, Norway, and Sweden. The intertwining of ownership in this sector may not afford an accurate picture of the issues studied in this paper. Finally, all companies that are foreign but listed and traded on these exchanges are removed (these are those companies whose ISIN code does not begin with “FI” or “NO”).

In general, the data is of very high quality. Virtually all listed companies are included in the data set. Data accuracy is slightly worse for the beginning of the time studied because Datastream seems to retain the entries for some smaller delisted companies for a limited time. If a company has two or more share classes, the total market value of the company is the sum of the market values of different share classes. If the company has issued Depository Receipts on a foreign market, this does not cause bias, since Depository Receipts do not add to the market value.

The correctness of the listing period is double-checked by obtaining listing dates from Datastream and removing data possibly from before this date. Delisting dates are obtained by picking the last date for which Datastream has recorded trading for share classes. Any data beyond this date is again removed to eliminate possible survival bias.

The Norwegian ownership data contains ISIN codes that can be used to combine data. Therefore, the combining process is efficient and can be considered error-free even in special situations such as mergers. Slight error is, however, caused by the process of

inclusion of companies in the received ownership database. In extraction of data from VPS records, it was noted that companies are included only if subject to public trading in January of the year in question. Therefore, companies starting trading in the middle of a year are only included in the next year's statistics. Delisting, however, is handled consistently and correctly. Official aggregate statistics from the Bank of Norway show somewhat higher foreign ownership than what is recorded in the research database. This is probably because the Bank of Norway includes all companies listed on OSE, including foreign companies that trade there, whereas only originally Norwegian companies are included in the research database.

The Finnish ownership data is accurate on the monthly level and includes ownership data from the exact month a firm starts trading. It does not, however, contain ISIN codes, which makes database construction somewhat more cumbersome, especially when mergers, acquisitions, or name changes take place. Additionally, the data records foreign ownership for the company as a whole, not by share class. Combining and correcting of the records is therefore done manually. Each share class is tracked and compared with trading history information from Datastream. In mergers and acquisitions, foreign ownership percentages for the share classes are kept separate until the acquisition date. After the acquisition, the reported foreign ownership percentage applies to the acquirer. If the company has two classes of shares, it is assumed that foreigners own the given percentage of both classes if the share classes have approximately equal market value and are traded equally. If one class has a clearly higher market value or liquidity, foreign ownership applies to that class only. This procedure is consistent with previous findings on investor preference and the logic behind dual share schemes. In essentially all

companies where two or more share classes exist, the non-liquid shares have greater voting rights and are held by original founders of the company or a similar insider group, not foreigners. The ownership of these shares is very concentrated, total value low, and liquidity limited. The method yields a very accurate database of foreign ownership. When the database is compared month on month with the official aggregate statistics published by the Bank of Finland, the results differ by only small fractions of a percent.

The accounting data for both Finland and Norway is annual in nature. Actual reported accounting figures are used. Corrections such as conversion of leases or removal of bias caused by different depreciation methods are not made, as notes to financial statements are not available. If the listed entity is a group, consolidated statements are used. In cases where the listed entity is part of another private or public group, group-internal debt is considered part of long-term debt if it has been classified as such. Group-internal short-term debt is removed from the calculation of current ratios and quick ratios. For Finnish data, voluntary accruals are considered part of equity and mandatory accruals are left out of the analysis. For Norwegian accounts, where such classification of accruals is not mandated, accruals are simply left out.

Finally, figures that result from abnormal activity are removed. For instance, an acquisition and the resulting share trading are considered abnormal. However, prices and market values are always considered “normal.” Therefore, all companies are included in the database, irrespective of their size. Also, when ratios are calculated from official accounting figures only or when market values are analyzed, these are considered “actual,” since they are values seen in the market on a particular day and there should be an investment rationale behind them.

The data collection results in an unbalanced data panel with 423 companies and a total of 21,772 observations. Of the companies, 172 are from the Helsinki Stock Exchange and 251 from the Oslo Stock Exchange. The data set starts from February 1994 and runs until September 2001. There are 93 companies with a full trading history throughout this span of time.

Market capitalization among the firms varies considerably in the sample. The highest market capitalization is recorded at 295 billion euros and the lowest at nearly zero. The largest companies are from telecommunications (Nokia, Sonera, Telenor), oil and energy (Statoil, Norsk Hydro, Fortum), and pulp and paper (UPM, Stora Enso) industries. Shares of the analyzed companies have produced a return of about 14% annually. The average PE of the companies is 14.3. Average foreign ownership percentage is 20%.

3.4.2 Statistical Model

First, to illustrate simple binary relationships between different firms or share class characteristics, I create portfolios from the data set and plot these over time. This analysis gives a general impression of the effects of different variables on foreign ownership.

Each portfolio is created by ordering shares from small to large on the basis of each variable studied. Following the methodology of Dahlquist and Robertsson (2001a), shares are allocated into quintiles and each quintile forms a portfolio. Portfolios are rebalanced each month by applying the same allocation method. New firms are included in portfolios immediately when they appear in the data set. This produces a time series of average values of each variable studied. The time series includes both equal-weighted and value-weighted foreign ownership for each portfolio. Portfolio values for each month and each

variable are plotted graphically to see how the effect has changed over time. An average of the monthly numbers is then taken, to provide summary statistics.

To further explore the relative importance of different variables, certain selected variables are chosen as pairs to generate two-dimensional portfolios. In a similar approach to that for basic portfolios, companies are assigned to portfolios of equal size in terms of number of companies. Portfolios are formed by dividing the shares into quartiles in two independent sorts, one for each variable. For there to be a sufficient number of shares in each portfolio, quintiles cannot be used. Again, portfolios are rebalanced each month on both variables to form time series that are then averaged over time to produce summary statistics.

Finally, panel regression is used to test the joint effect of the full set of variables studied. Following the approach used by Kang and Stulz (1997), a panel data regression with random-effects model is used. The model is tobit since the dependent variable, foreign ownership percentage, is always limited so as to be between 0% and 100%. The distribution of foreign ownership is transformed into restricted normal with Box-Cox transformation. Box-Cox transforms the variable so that the minimum value is about -3.14 (0% ownership) while the maximum is 0 (100% ownership). This does not change the assumptions of tobit regression, nor the sign of variables.

There is, unfortunately, no way to calculate a fixed-effects model for panel data tobit because there does not exist a sufficient statistical base allowing the fixed effects to be conditioned out of the likelihood (Stata 2006). Because there is no method to employ the model here, tests such as the Hausman test or Breuch–Pagan test that rely on comparing

the estimates from both models cannot be performed to determine whether the fixed-effects model might have been more appropriate, if it had been possible to perform the necessary calculations.

The theoretical assumptions of the random-effects model still do seem to fit the situation well and better than those of a fixed-effects model. One can easily imagine omitted variables that are constant over time but vary between cases, such as communication policy. Some companies have a fixed and consistent policy of producing all financial reports in multiple languages to please international owners, while other companies use only one language. Similarly, issues such as stock exchange rules, general market climate, and legislation are fixed between cases but vary over time. These would justify the use of a random-effects model.

The base equation for the regression is therefore

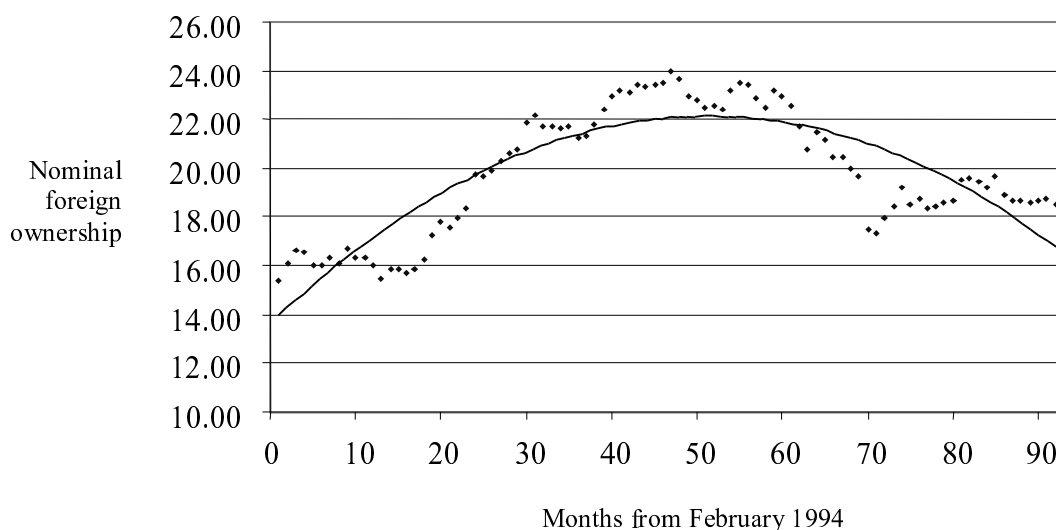
$$y_{it} = \alpha + \sum_{k=1}^b \beta_k x_{kit} + v_i + u_{it} ,$$

where y_{it} is the nominal foreign ownership percentage, α is the regression constant, $v_i + u_{it}$ is the residual, β_k are the regression coefficients for k independent variables, and x_{kit} are k independent variables measured for each firm i over each time period t and shown in Table 1. The model assumes that v_i and $E(x_{ki})$ are non-correlated – i.e., that there is a separate random independent effect for each company that represents the effects of the omitted variables and is constant over time. Finally, u_{it} is the error term that is peculiar to both individual units and time periods. All statistical methods used are robust for missing or unequally spaced values in the unbalanced panel.

Though investor appeal cannot be considered completely fixed, many of the factors are not completely random if investor appeal changes in trends. There are potentially two problems in the data set studied. First, the data starts one year after limitations on foreign ownership were removed in the countries studied. Foreigners may have had an untapped interest in investing in equities in the two countries, and acquiring large stakes in companies takes time. Thus, there should be a time variant component in the general flow of capital to the country in question. This trend of untapped interest is probably strongest at the beginning of the time range considered. Second, the “technology bubble” has probably caused herd behavior with a distinct trend. If foreigners are generally momentum traders, as has been shown by previous research (see, e.g., Grinblatt and Keloharju 2000), their capital flows should be affected by this time of hype and weights in investment patterns may not be explained by the variables for which data has been collected. Since this is a behavioral effect that attracts capital to the market, it is reasonable to assume that the trend is affected by the performance of the total stock index, not individual firms’ performance.

A closer look at the average ownership over the time studied shows that Oslo has had a very stable foreign ownership structure while there is a quite clear parabola-shaped upward and downward trend for Helsinki. This is shown in Figure 3.2. The trend begins in the early years 1994 and 1995 and reaches its peak just before the boom years. The upward trend is probably because of an increasing foreign interest in the rising economy. The downward trend is most likely a mixture of two factors: high flow of domestic money to the market as the market overheated at the end of 1999 (months 60 to 70 in the data set) and the retreat of foreign capital as the market underperformed.

Figure 3.2 *Nominal foreign ownership in the Helsinki Stock Exchange, with trend approximation*



This potential problem is remedied by including a trend factor m_t in the regression. This represents the total average nominal ownership percentage in an exchange and captures the effect of investors rushing into the market irrespective of the specific characteristics of individual firms. The equation for the panel data regression therefore becomes

$$y_{it} - m_t = \alpha + \sum_{k=1}^b \beta_k x_{kit} + v_i + u_{it} ,$$

where y_{it} , α , β_k , x_{kit} , v_i , and u_{it} are as defined above and m_t represents the time variant trend component in average foreign ownership over the period. Additionally, a lagged foreign ownership statistic is included in the equation. More on choosing this lagged variable is discussed in the results section, below.

3.5 Results

3.5.1 Binary Relations Using One-dimensional Portfolios

Judging purely by the simple one-dimensional portfolios, it looks very clear that foreign ownership is above all a question of size. Foreigners prefer large companies to small companies, as has also been shown by previous studies (e.g., Kang and Stulz 1997, Dahlquist and Robertsson 2001b).

The greater the market value of the company, the larger the foreign ownership percentage. A linear relationship between formed portfolios and both equal-weighted and value-weighted average foreign ownership is shown in Table 3.1.

Figure 3.3 *Average foreign ownership in ranked market capitalization portfolios in shares from Helsinki and Oslo*

Shares are ranked according to a market capitalization and divided into quintiles. Equal-weight averages are calculated by averaging over the shares in the portfolio. The average for each month is shown in the figure. Firms in quintile 1 have a low market capitalization, while firms in quintile 5 have high market capitalization.

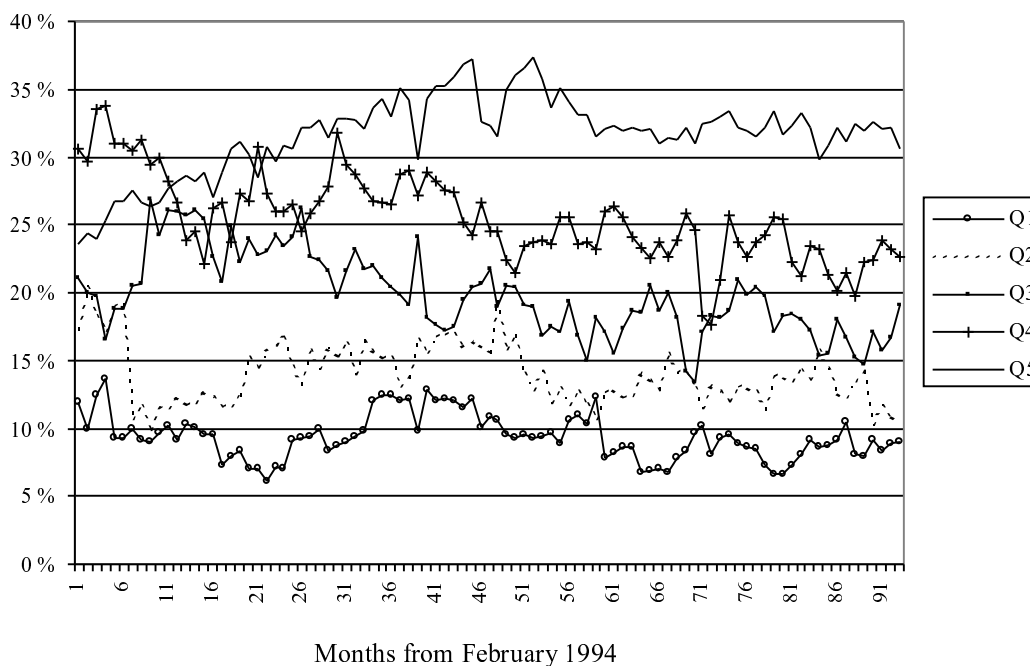


Table 3.1 *Average foreign ownership in ranked portfolios, shares from Oslo and Helsinki pooled*

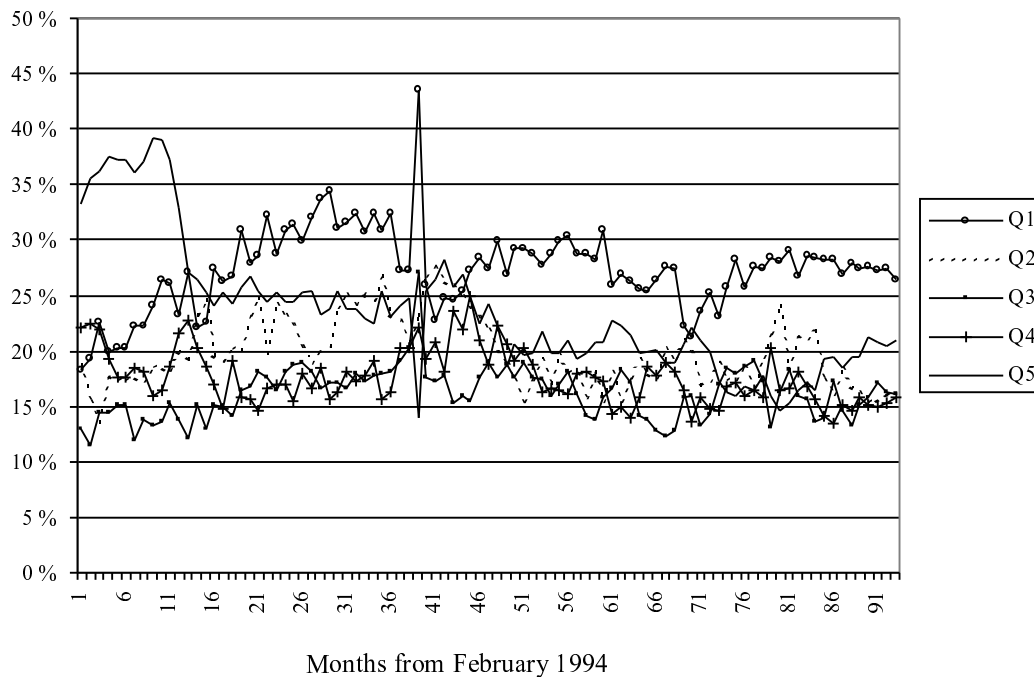
Shares are ranked according to a characteristic and divided into quintiles. Equal-weight and value-weight averages are calculated by averaging first over the portfolio and then over all months in the data set. Quintile 1 has a low measurement for the characteristic, and quintile 5 has a high one. The average measurement is shown in each column under ownership percentages. N shows the average number of companies in the quintiles, measured over the whole period.

	Quintiles										N
	Q1		Q2		Q3		Q4		Q5		
	Equal weight	Value weight	Equal weight	Value weight	Equal weight	Value weight	Equal weight	Value weight	Equal weight	Value weight	
Foreign ownership	9.28 %	7.85 %	13.85 %	11.87 %	19.69 %	18.02 %	25.24 %	23.67 %	31.42 %	46.43 %	48
Market capitalization		12.3		40.8		109.7		270.0		2 649.7	
Foreign ownership	27.10 %	56.76 %	19.77 %	32.75 %	16.09 %	30.32 %	17.53 %	25.66 %	23.15 %	32.96 %	42
Book-to-market ratio		0.20		0.46		0.74		1.15		2.81	
Foreign ownership	21.47 %	29.32 %	21.68 %	31.75 %	23.11 %	55.96 %	19.45 %	31.36 %	17.62 %	21.59 %	44
Current ratio		0.93		1.35		1.67		2.21		5.69	
Foreign ownership	24.93 %	62.45 %	17.49 %	31.29 %	19.05 %	29.58 %	19.23 %	28.69 %	22.57 %	34.57 %	41
Debt-to-equity ratio		0.02		0.14		0.40		0.89		3.70	
Foreign ownership	21.12 %	27.75 %	19.32 %	29.61 %	18.61 %	34.85 %	20.78 %	34.57 %	23.17 %	48.10 %	42
PE ratio		-35.96		4.27		9.19		15.96		79.57	
Foreign ownership	19.52 %	29.09 %	22.96 %	30.98 %	23.13 %	53.78 %	19.37 %	33.43 %	18.03 %	23.26 %	44
Liquid to total assets		0.64		0.94		1.20		1.69		5.23	
Foreign ownership	20.92 %	28.38 %	19.29 %	28.56 %	17.93 %	26.55 %	21.55 %	30.08 %	23.43 %	58.91 %	42
Return on equity		-62.94 %		4.75 %		10.57 %		16.44 %		42.97 %	
Foreign ownership	20.95 %	33.27 %	19.71 %	30.45 %	19.12 %	31.95 %	19.70 %	32.66 %	21.86 %	39.88 %	43
Past month's return		-13.60 %		-4.31 %		0.36 %		5.31 %		16.53 %	
Foreign ownership	20.23 %	28.71 %	19.79 %	32.49 %	18.83 %	27.54 %	19.67 %	30.14 %	24.52 %	51.95 %	40
Past year's return		-34.00 %		-6.05 %		11.48 %		32.53 %		86.90 %	
Foreign ownership	21.78 %	30.94 %	19.86 %	32.71 %	19.34 %	27.47 %	19.24 %	28.48 %	21.69 %	43.98 %	43
Next year's return		-38.13 %		-9.31 %		7.47 %		27.34 %		77.60 %	
Foreign ownership	11.67 %	16.92 %	13.58 %	19.89 %	19.56 %	27.37 %	27.25 %	47.58 %	25.95 %	44.72 %	39
Share turnover		0.16 %		1.11 %		2.74 %		5.65 %		19.23 %	
Foreign ownership	18.36 %	26.30 %	20.53 %	27.10 %	21.75 %	39.17 %	21.75 %	45.02 %	21.53 %	43.81 %	40
Return volatility		22.26 %		31.37 %		37.25 %		45.56 %		66.29 %	

Naturally, the effect is even stronger for the value-weighted average, since both ownership share and market value are larger. As shown in Figure 3.3, this relationship is consistent over time. There also seems to be a U-shaped relationship between book-to-market ratio and foreign ownership. Dahlquist and Robertson (2001b) find a similar relationship in their binomial portfolio study of the Swedish market, but their results show a strong linear relationship implying that foreign investors prefer growth stocks (i.e., shares with low book-to-market ratios). This relationship was, however, shown to be spurious when size was controlled, since book-to-market ratio is by construction correlated with size. The U-shaped relationship, however, cannot be explained purely with the same logic. Figure 3.4 shows how foreign ownership has been quite consistently higher in the firms with the lowest book-to-market ratio, while the difference is not as clear in other groups. Relative positions between all groups other than the lowest-book-to-market group also change over time. The U shape may be a result of pooled averaging when such a change occurs.

Figure 3.4 *Average foreign ownership in ranked book-to-market portfolios in shares from Helsinki and Oslo*

Shares are ranked according to a market capitalization and divided into quintiles. Equal-weight averages are calculated by averaging over the shares in the portfolio. Average for each month are shown in figures. Firms in quintile 1 have a low book-to-market ratio, while firms in quintile 5 have a high one.



Looking at the exchanges separately, Table 3.2 and Table 3.3 show that the relationship is linear in Helsinki while it is U-shaped in Oslo. This may imply that, even though the linearity and seemingly clear preference for growth stocks is a result of the size effect, there is still a preference for value investing in Oslo.

A linear relationship between share turnover and foreign ownership can also be found. The effect is consistent in both exchanges. This effect cannot fully be explained by size without further controls. Large caps do trade more simply because they are more visible

and their ownership structure is more dispersed (Stoll 1989). However, foreigners may also prefer liquid shares as such, as compared to domestic investors, because a larger proportion of foreigners are financial institutions for whom short-term liquidity is important.

An interesting relationship can be found also in how foreign investors have responded to returns. There is a clearly higher foreign ownership percentage for shares that had performed well in the year prior, whereas such a relationship cannot be found with shares that have proceeded to perform well in the future. The result is found both in raw returns and for index-corrected returns. If this holds when other factors are controlled, the finding would be consistent with previous findings of momentum investing among foreign investors. Further, the relationship cannot be seen in short periods of time, such as return over the past month, implying that accumulating foreign ownership takes some time. This effect cannot be explained by size alone. Return premiums are related to size, but the effect should in general be opposite; i.e., small caps should provide better returns for both raw and risk-adjusted measurements (Banz 1981, Fama and French 1993).

Table 3.2 *Average foreign ownership in ranked portfolios, shares from Helsinki only*

Shares are ranked according to a characteristic and divided into quintiles. Equal-weight and value-weighted averages are calculated by averaging first over the portfolio and then over all months in the data set. Quintile 1 has a low measurement for the characteristic, while quintile 5 has a high one. The average measurement is shown in each column under ownership percentages. N shows the average number of companies in the quintiles, measured over the whole period.

	Quintiles										N
	Q1		Q2		Q3		Q4		Q5		
	Equal weight	Value weight	Equal weight	Value weight	Equal weight	Value weight	Equal weight	Value weight	Equal weight	Value weight	
Foreign ownership	7.80 %	6.70 %	16.51 %	14.16 %	18.98 %	16.64 %	23.59 %	21.63 %	29.77 %	50.71 %	21
Market capitalization		14.9		55.0		172.1		397.4		4 405.0	
Foreign ownership	28.31 %	61.01 %	21.45 %	34.89 %	18.30 %	28.65 %	17.42 %	22.64 %	16.76 %	25.05 %	15
Book-to-market ratio		0.26		0.54		0.84		1.26		2.54	
Foreign ownership	22.25 %	27.34 %	20.92 %	29.86 %	24.33 %	58.70 %	21.16 %	30.46 %	14.38 %	11.73 %	18
Current ratio		0.99		1.34		1.62		2.08		4.12	
Foreign ownership	22.97 %	63.86 %	18.19 %	29.75 %	20.53 %	26.57 %	21.09 %	32.34 %	19.17 %	23.08 %	14
Debt-to-equity ratio		0.04		0.16		0.36		0.68		2.14	
Foreign ownership	19.15 %	23.96 %	19.47 %	33.07 %	20.54 %	32.47 %	21.91 %	30.76 %	21.52 %	51.38 %	16
PE ratio		-18.83		6.18		9.45		14.89		84.09	
Foreign ownership	21.38 %	27.96 %	22.35 %	31.26 %	22.41 %	36.50 %	20.85 %	48.59 %	15.35 %	12.13 %	18
Liquid to total assets		0.63		0.88		1.10		1.48		3.23	
Foreign ownership	19.74 %	27.71 %	16.77 %	18.76 %	17.60 %	24.45 %	20.10 %	30.40 %	29.12 %	63.47 %	18
Return on equity		-19.27 %		7.90 %		12.16 %		17.46 %		31.29 %	
Foreign ownership	21.38 %	32.64 %	19.39 %	27.75 %	18.16 %	28.10 %	19.47 %	29.93 %	22.37 %	40.59 %	18
Past month's return		-11.67 %		-3.83 %		0.56 %		5.15 %		15.39 %	
Foreign ownership	21.27 %	32.88 %	19.45 %	28.85 %	18.52 %	29.72 %	19.09 %	31.06 %	22.54 %	39.70 %	18
Past year's return		-25.89 %		-2.78 %		13.78 %		34.37 %		84.51 %	
Foreign ownership	22.23 %	32.06 %	19.81 %	27.94 %	18.85 %	29.11 %	19.44 %	30.10 %	23.34 %	38.74 %	16
Next year's return		-30.25 %		-6.00 %		9.60 %		27.84 %		76.09 %	
Foreign ownership	12.07 %	14.82 %	11.79 %	17.01 %	15.70 %	20.84 %	21.23 %	33.96 %	27.73 %	57.93 %	14
Share turnover		0.14 %		0.84 %		1.81 %		3.36 %		8.60 %	
Foreign ownership	18.33 %	18.11 %	19.50 %	25.73 %	21.25 %	32.40 %	22.26 %	41.89 %	22.38 %	45.34 %	15
Return volatility		21.81 %		30.89 %		36.06 %		42.40 %		58.73 %	

Table 3.3 *Average foreign ownership in ranked portfolios, shares from Oslo only*

Shares are ranked according to a characteristic and divided into quintiles. Equal-weight and value-weighted averages are calculated by averaging first over the portfolio and then over all months in the data set. Quintile 1 has a low measurement for the characteristic, and quintile 5 has a high one. The average measurement is shown in each column under ownership percentages. N shows the average number of companies in the quintiles, measured over the whole period.

	Quintiles										N
	Q1		Q2		Q3		Q4		Q5		
	Equal weight	Value weight	Equal weight	Value weight	Equal weight	Value weight	Equal weight	Value weight	Equal weight	Value weight	
Foreign ownership	9.91 %	8.90 %	13.10 %	12.52 %	17.84 %	16.71 %	24.48 %	24.01 %	35.32 %	34.04 %	27
Market capitalization	11.9		36.3		85.3		192.6		1 074.7		
Foreign ownership	26.13 %	33.53 %	19.57 %	30.89 %	14.95 %	27.71 %	16.62 %	28.34 %	25.84 %	37.54 %	26
Book-to-market ratio	0.18		0.43		0.69		1.07		2.88		
Foreign ownership	20.22 %	28.21 %	21.21 %	29.68 %	21.85 %	32.71 %	19.60 %	32.02 %	19.80 %	31.14 %	25
Current ratio	0.91		1.37		1.73		2.32		6.77		
Foreign ownership	25.16 %	39.93 %	16.77 %	24.22 %	18.67 %	28.41 %	19.77 %	31.29 %	22.41 %	35.60 %	27
Debt-to-equity ratio	0.02		0.14		0.47		1.16		4.54		
Foreign ownership	21.38 %	30.68 %	20.41 %	33.00 %	17.33 %	26.63 %	18.83 %	28.73 %	24.18 %	34.83 %	25
PE ratio	-45.40		1.71		8.69		16.73		76.73		
Foreign ownership	17.95 %	24.91 %	23.11 %	30.59 %	21.66 %	34.19 %	20.00 %	32.02 %	20.09 %	30.04 %	26
Liquid to total assets	0.66		1.01		1.32		1.91		6.54		
Foreign ownership	20.19 %	29.02 %	20.50 %	32.68 %	20.32 %	30.42 %	22.29 %	31.79 %	19.00 %	25.69 %	25
Return on equity	-93.20 %		0.82 %		8.91 %		15.26 %		52.98 %		
Foreign ownership	21.01 %	30.65 %	19.46 %	29.73 %	19.61 %	30.16 %	19.94 %	29.55 %	21.69 %	32.20 %	25
Past month's return	-14.32 %		-4.52 %		0.40 %		5.53 %		17.02 %		
Foreign ownership	20.38 %	28.84 %	19.86 %	30.33 %	18.64 %	30.28 %	20.19 %	32.20 %	23.75 %	37.23 %	24
Past year's return	-37.18 %		-8.17 %		9.47 %		31.00 %		86.67 %		
Foreign ownership	22.55 %	27.64 %	22.03 %	28.69 %	23.57 %	29.76 %	21.25 %	27.84 %	23.46 %	30.33 %	19
Next year's return	-40.39 %		-11.37 %		5.75 %		26.38 %		77.28 %		
Foreign ownership	11.16 %	20.74 %	14.96 %	22.01 %	22.13 %	29.25 %	28.08 %	34.65 %	25.28 %	36.46 %	26
Share turnover	0.19 %		1.41 %		3.59 %		7.29 %		22.92 %		
Foreign ownership	18.59 %	30.42 %	21.29 %	29.17 %	21.28 %	30.74 %	21.53 %	38.06 %	20.83 %	41.76 %	24
Return volatility	23.03 %		32.36 %		39.39 %		48.77 %		70.92 %		

Foreign ownership by industry is presented in Table 3.4. The industry classifications are based on data from Datastream, and groups have been made to mimic the classification by Dahlquist and Robertsson (2001a) as closely as possible, for compatibility. In terms of industries, foreigners tend to overweight telecoms and pulp and paper companies in Helsinki and shipping companies in Oslo. Engineering, which includes telecoms stocks, is also the most overweighted industry in Stockholm, according to Dahlquist and Robertsson. It is noteworthy to point out that there was a large value appreciation of telecoms and IT shares in Helsinki in the late 1990s. This can be seen in the large difference between value-weighted and equal-weighted foreign ownership percentages in this particular industry.

It is difficult to draw conclusions as to whether those companies that belong to an industry for which a country is known have larger foreign ownership than others. The phenomenon is further explored in Table 3.5, where averages are taken from two groups; those companies that belong to the desirable industry and those that do not. It seems that, overall, those companies that belong to such a focal group attract more foreign investors. But there may again be a size effect. Most companies in such an industry are large and well-known.

Table 3.4 *Equal-weight and value-weighted foreign ownership statistics for different industries in Helsinki and Oslo*

	All			HEX			OSE		
	Equal weight	Value weight	Max. N	Equal weight	Value weight	Max. N	Equal weight	Value weight	Max. N
Airlines, shipping, transportation	21.8%	24.8%	43	27.4%	22.7%	8	16.2%	26.9%	43
Media, leisure	16.8%	22.1%	12	20.0%	20.2%	9	13.5%	24.1%	12
Chemicals and pharmaceuticals	18.9%	19.0%	7	15.0%	14.2%	7	22.7%	24.0%	6
Oil expeditions, drilling	19.4%	22.1%	20	3.0%	3.0%	1	31.4%	36.0%	20
Pulp & paper	25.6%	32.7%	6	33.1%	43.0%	6	18.0%	22.4%	5
Utilities and other	26.9%	32.1%	9	0%	0%	0	26.9%	32.1%	9
Retail and consumer goods	21.9%	29.6%	20	21.9%	27.4%	20	22.0%	31.8%	10
General engineering, construction, mining, metals	19.4%	30.5%	33	18.3%	26.0%	28	20.5%	35.1%	33
Electronics, IT, telecommunications	25.2%	51.2%	45	26.4%	69.2%	45	24.0%	33.0%	34

Table 3.5 *Equal-weight and value-weighted foreign ownership for the so-called focus companies and non-focus companies in Helsinki and Oslo*

	HEX			OSE		
	Equal weight	Value weight	N	Equal weight	Value weight	N
Focus companies	26.6%	62.8%	23	20.1%	33.4%	53
Non-focus companies	18.8%	22.4%	71	20.4%	30.6%	79

Finally, firms list on foreign exchanges to further expand their ownership base and attract foreign owners. Cross-listed firms should therefore have a higher foreign ownership. Dahlquist and Robertsson (2001a) find that Swedish cross-listed firms do indeed have a higher foreign ownership. Looking at Table 3.6, one finds that this seems to be true also for Norwegian and Finnish firms. Measured in terms of both equal-weighted and value-

weighted averages, cross-listed companies have a higher foreign ownership percentage.

One must, however, note again that all Nordic cross-listed companies are fairly large.

Table 3.6 *Equal-weight and value-weighted foreign ownership for cross-listed and domestic listed companies in Helsinki and Oslo*

	HEX			OSE		
	Equal weight	Value weight	N	Equal weight	Value weight	N
Cross-listed companies	40.9%	64.0%	10	39.7%	36.0%	6
Domestic listed companies	18.1%	22.1%	86	19.3%	29.4%	126

3.5.2 Control for Size in Two-dimensional Portfolios

To control for the size issue, a further analysis is performed using two-dimensional portfolios where the other dimension is always market capitalization. This analysis confirms that turnover is an independent factor foreigners look at and that they tend to overweight the associated shares. Companies that both are large and have a high turnover have an above average foreign ownership (over 40%), whereas large companies that are illiquid have a low foreign ownership. However, the book-to-market effect pretty much disappears from the sample from Helsinki when size is controlled in the portfolios. The same U-shaped distribution found earlier can be found from the Oslo sample when two-dimensional portfolios are used. In all size-based portfolios, companies with very high and very low book-to-market ratios have a higher foreign ownership.

Some evidence of momentum investing behavior can be seen from the two-dimensional portfolios. Large firms with high past returns have the highest foreign ownership in both

exchanges. The averages of portfolios formed based on both size and the previous year's return are shown in Table 3.7. One must, however, note that in both exchanges there are only a few large companies and therefore the distributions are quite skewed, which makes the averages as well somewhat unreliable.

Table 3.7 *Equal-weight foreign ownership averages for portfolios formed on the basis of market capitalization and share turnover or the past year's return*

Portfolios are formed by sorting the shares in two independent sorts into quartiles. The percentage shows average foreign ownership of the quartile over the time span studied. Figures in parentheses show average values of the two sort variables for the quartile.

Panel A: All shares included. Portfolios based on market capitalization and share turnover.

		Market capitalization			
		Q1	Q2	Q3	Q4
Share turnover	Q1	7.5 % (14.4, 0.2)	11.0 % (61.1, 0.3)	14.1 % (194.2, 0.3)	21.8 % (873.8, 0.3)
	Q2	8.9 % (15, 1.6)	12.9 % (61.5, 1.6)	17.1 % (197.5, 1.6)	21.9 % (1127.1, 1.8)
	Q3	11.3 % (16, 4.3)	17.1 % (61.7, 4.3)	23.7 % (194.1, 4.4)	34.7 % (2780.7, 4.3)
	Q4	12.5 % (15.5, 22.1)	19.1 % (62, 16.8)	31.7 % (192.7, 15.1)	43.7 % (2623.6, 12.4)

Panel B: All shares included. Portfolios based on market capitalization and past year's return.

		Market capitalization			
		Q1	Q2	Q3	Q4
Past year's return	Q1	12.8 % (14.4, -34.6)	19.6 % (58.4, -31.5)	26.1 % (191.3, -26.6)	28.7 % (2198.3, -22.5)
	Q2	7.9 % (15.4, 0.3)	13.7 % (61.5, 0.1)	20.1 % (203.8, 0.6)	30.5 % (1253.5, 0.9)
	Q3	8.2 % (14.7, 23.3)	15.1 % (63.5, 23.4)	19.0 % (197.8, 24)	28.4 % (1262.9, 23.3)
	Q4	7.7 % (16.7, 78.2)	16.7 % (66, 76.2)	24.8 % (194.4, 76.2)	37.7 % (3842.4, 80.4)

Panel C: Shares from Helsinki only. Portfolios based on market capitalization and past year's return.

		Market capitalization			
		Q1	Q2	Q3	Q4
Past year's return	Q1	9.8 % (18.1, -25)	22.7 % (89.6, -24.4)	24.1 % (295.9, -21.7)	25.7 % (2806.6, -19.2)
	Q2	9.1 % (20.9, 2.8)	16.5 % (93.5, 2.4)	22.4 % (313.6, 3.2)	25.6 % (1836.7, 3.3)
	Q3	7.5 % (16.9, 22.9)	17.1 % (101.6, 24.8)	17.2 % (290.9, 25.7)	24.9 % (1441.7, 24.7)
	Q4	7.1 % (17, 68.4)	16.6 % (89.3, 70.8)	21.5 % (297.3, 71.6)	40.3 % (7838.1, 84.7)

3.5.3 Tobit Regressions

To control for the problematic size effects and to take into account also other variables and time effects, a tobit regression is run on the data panel with the variables described in section 3.4.2. A problem with ownership data of high frequency is that ownership tends to change very little in a short period of time, especially when it comes to aggregate figures for a large investor group. To explore this further, differences in ownership within certain time periods are examined. Table 3.8 below shows how the standard deviation for change of foreign ownership increases as time period is extended. The mean change is always close to zero since, on average, the aggregate foreign ownership does not change much – money just flows between companies and investors with zero net effect.

Table 3.8 *Mean and standard deviation of change in foreign ownership statistics over periods from one month to 42 months*

Change in ownership is calculated as ownership at time t minus the ownership lagged by the number of months as shown in the table. Mean and standard deviation are calculated over all values produced with this method.

Variable	Mean	Std. dev.
Change in ownership, one month	.00093	.056
Change in ownership, three months	-.00003	.119
Change in ownership, six months	-.00007	.160
Change in ownership, nine months	-.00010	.185
Change in ownership, 12 months	-.00014	.204
Change in ownership, 18 months	-.00024	.230
Change in ownership, 24 months	-.00036	.249
Change in ownership, 30 months	-.00048	.263
Change in ownership, 36 months	-.00062	.274
Change in ownership, 42 months	-.00074	.282

In very short periods of time, the change in foreign ownership can be considered to be close to a random walk. The time series has high autocorrelation. To get an idea of the extent of autocorrelation in various time periods, correlation coefficients are calculated between ownership at time t and lags of from one to 42 months. Table 3.9 below shows the results.

Table 3.9 *Correlation between foreign ownership statistic and foreign ownership lagged by the number of months shown in the table*

Lag length (in months)	1	3	6	9	12	18	24	30	36	42
Correlation	0.97	0.87	0.76	0.68	0.61	0.50	0.42	0.35	0.29	0.25

Because of the autocorrelation, running a regression on monthly data does not make much sense. Ownership for the previous month basically explains almost fully the ownership in the next month. A compromise between data accuracy and meaningfulness is therefore required. In the regressions shown below, a time lag of six months was chosen as the starting point. This is because with a six-month lag the correlation coefficient drops below 80%, which is generally considered a limit of tolerance for collinearity in regression models. Further, the difference of standard deviations obtained by extending the period starts to stabilize at this level. Autocorrelation drops the longer the time, and tests are run with a 12-month lag also, for comparison. Table 3.10 shows the operationalization of variables used in the regressions.

Table 3.10 *Operationalization of the dependent and independent variables for studying foreign investor preferences with tobit regressions*

Variable	Explanation	Data source
Dependent variable		
Foreign ownership	Box-Cox-transformed percentage of shares in foreign ownership.	APK or VPS
Independent variables		
Cross-listed	A dummy indicating whether the company has its shares listed on one or more foreign exchanges, either as shares or as depository receipts.	Stock exchange
Market capitalization	Natural logarithm of share class market value, in millions of euros.	Datastream
Share turnover	Natural logarithm of percentage of market capitalization traded per month.	Datastream
Past return, one-year	Raw return for the share class in the previous year. Return includes value appreciation and dividends.	Datastream
Abnormal return, past year	Index-corrected return for the share class in the previous year. Return includes value appreciation and dividends.	Datastream
Quick ratio	Natural logarithm of liquid assets (cash, tradable securities, and receivables) divided by current liabilities as shown on the last annual financial statement.	Asiakastieto or OBI
Return on equity	Earnings divided by book value of equity as shown on the last annual financial statement.	Asiakastieto or OBI
Focus company	A dummy variable indicating whether the industry the company belongs to is that of the focus of the exchange.	Datastream
Control variables		
Lagged foreign ownership	Box-Cox-transformed foreign ownership percentage, lagged by six or 12 months, depending on model.	APK or VPS
Exchange	A dummy marking the exchange where the shares are listed: 0 if Oslo, 1 if Helsinki.	Manually entered

Table 3.11 further displays the correlation coefficients between independent variables and shows that no significant multicollinearity should be expected.

Table 3.11 *Correlation coefficients of independent variables used in tobit regressions of foreign investor preferences*

	Foreign ownership	Market value	Turnover	One-year return	Quick ratio	ROE	Foreign listed	Focus company
Foreign ownership (Box-Cox-transformed, six-month lag)	1.00							
Log of market value	0.40	1.00						
Log of turnover	0.32	0.22	1.00					
Return for past year	0.05	0.19	0.18	1.00				
Log of quick ratio	-0.05	-0.10	0.00	0.02	1.00			
Return on equity	-0.02	0.05	-0.02	0.04	-0.04	1.00		
Cross-listed (dummy)	0.25	0.43	0.12	0.08	-0.06	0.02	1.00	
Focus company (dummy)	0.01	-0.01	-0.02	-0.03	0.17	-0.03	0.09	1.00

Results from four models are reported. Model A includes all variables with a six-month-lagged foreign ownership as one parameter and considers the past year's return compared to the stock index (regression over difference in return). Model B is similar to A, except that returns are taken as raw past-year returns, not index-corrected. Model C is the same as model A, except that time-series data is measured annually instead of semi-annually and the foreign ownership included in regression is similarly lagged by 12 months. Model D tests the effects of the assumption of a larger trend in foreign ownership. Unlike in other models, in model C no trend correction is applied to the foreign ownership figures.

Table 3.12 shows the results of the regressions with various models.

Table 3.12 Tobit regression of determinants of foreign ownership of firms in the Oslo and Helsinki stock exchanges

The table shows results of a cross-sectional time-series tobit regression of all shares from Oslo and Helsinki in the data set for all months from January 1993 to September 2001. The dependent variable is nominal foreign ownership percentage (Box-Cox-transformed).

Variable	Hypothesized direction	Model A	Model B	Model C	Model D
Independent variables					
Hypothesis H1: Market value (log)	+	.0742 *** (9.5)	.0877 *** (11.11)	.0853 *** (7.02)	.0717 *** (8.89)
Hypothesis H6: Share turnover (log)	+	.0121 *** (3.67)	.0133 *** (3.97)	.0184 ** (3.09)	.0131 *** (3.84)
Hypothesis H7: Return for past year, raw	+		-.0003 *** (-3.00)		
Hypothesis H7: Return for past year, index-corrected	+	.0002 + (2.49)		.0005 ** (3.16)	.0003 ** (3.10)
Hypothesis H5: Quick ratio (log)	+	-0.131 (-0.99)	-.0033 (-0.26)	-.0491 * (-2.27)	-.0124 (-0.9)
Hypothesis H4: Return on equity	+	-.0252 *** (-4.35)	-.0217 *** (-3.59)	-.0179 (-1.41)	-.0268 *** (-4.48)
Hypothesis H3: Cross-listed, dummy	+	.0344 (0.42)	.0363 (0.38)	.0811 (0.92)	.0093 (0.10)
Hypothesis H2: Focus company, dummy	+	.0323 (0.99)	.0494 (1.37)	.0549 (1.33)	.0416 (1.27)
Constant	+/-	-.949 *** (-17.00)	-1.1088 *** (-20.81)	-1.1671 *** (-12.39)	-.9887 *** (-16.41)
Control variables					
Lagged foreign ownership, six months (Box-Cox-transformed)	+	.609 *** (30.97)	0.549 *** (32.51)		.6003 *** (29.96)
Lagged foreign ownership, 12 months (Box-Cox-transformed)	+			.4971 *** (13.73)	
R ²		.791	.758	.654	.787

*** $p \leq .001$, ** $p \leq .01$, * $p \leq .05$, + $p \leq .10$

Tobit calculations are done with the Stata statistics package, which uses a quadrature approximation for random-effects estimators. This method may be sensitive to quadrature size. Tests on the impact of quadrature size show that the relative difference between significant coefficients measured with differing quadrature parameters is less than 1%, implying that the model is appropriate (Stata 2006).

I perform further robustness tests on the models by rerunning the regressions with limited data sets and comparing the results. The most important checks include running the same regression separately on each exchange and excluding Nokia shares from the data set. Excluding Nokia is done because the company accounted for almost 70% of the market value of the Helsinki Stock Exchange at the high point of the technology boom and the company has a very high foreign ownership.

The results of running model A without Nokia shares produces the following results, which are almost identical to the results with Nokia shares included.

Table 3.13 Foreign investor preference regressions run with a limited data set as robustness test

Coefficients of regressions performed on Model A with data set excluding the mobile phone maker Nokia. Regressions with the limited data set run on Models B, C, and D produce differences similar to those of the original model.

Variable	Model A without Nokia
Market value (log)	.0761 *** (9.47)
Share turnover (log)	.0121 *** (3.66)
Return for past year, index-corrected	.0002 + (2.40)
Quick ratio (log)	-0.127 (-0.96)
Return on equity	-.0254 *** (-4.37)
Cross-listed, dummy	.0125 (0.14)
Focus company, dummy	.0320 (0.99)
Constant	-.9449 *** (-16.47)
Lagged foreign ownership, six months (Box-Cox-transformed)	.6174 *** (30.89)

Completely excluding all shares from one exchange causes a somewhat larger change. In shares from Oslo only, significant variables, their magnitude, their sign, and the significance level remain essentially the same as in the original models, with the exception of past returns. Here the significance level drops considerably. The difference is easy to see when the same model is applied to shares from Helsinki only. Here the results are the opposite; past returns have a significant impact, while the significance of return on equity drops. The results are shown in Table 3.14 below.

Table 3.14 *Tobit regressions of foreign investor preference with data sets from individual exchanges*

Variable	Model A, Oslo only	Model A, Helsinki only
Market value (log)	.0839 *** (7.12)	.0314 *** (4.25)
Share turnover (log)	.0123 ** (2.75)	.0129 ** (3.13)
Return for past year, index-corrected	.0000 (0.42)	.0005 *** (4.20)
Quick ratio (log)	-.0077 (-0.47)	-.0311 + (-1.87)
Return on equity	-.0264 *** (-4.10)	.0175 (0.93)
Cross-listed, dummy	-.0961 (-1.24)	.9038 + (2.32)
Focus company, dummy	.0237 (0.52)	.0089 (0.38)
Constant	-1.1012 *** (-14.56)	-.3994 *** (-5.56)
Lagged foreign ownership, six months (Box-Cox-transformed)	.5790 *** (25.24)	.8445 *** (32.39)

3.5.4 Analysis of the Results

The regressions shed light on the interrelationship of variables such as size and turnover when it comes to foreign ownership. The results indicate that the clearest variables already found in portfolio analyses – size and turnover – have an independent effect on the preferences of foreign investors. Supporting hypotheses H1 and H6, the foreign investor proportion is high for firms that are large and firms that are liquid. Foreign investors clearly overweight large caps over small caps in a fashion that is opposite to the manner of domestic investors.

Causality between share turnover and foreign investor preference cannot be inferred from this data alone. It could be that turnover is high in firms with high foreign ownership because they are owned by foreign investors, who trade more. Investors from a small domestic economy do not have enough funds and volume to sustain an amount of trading that would keep a large multinational liquid. Therefore, a large part of trading volume must originate from the actions of foreign investors. In this case, turnover would be not a prerequisite for foreign investment but a result of it.

The different aspects of share turnover are more thoroughly discussed in Chapter 5. As becomes evident from that discussion, liquidity is a typical “chicken and egg” phenomenon, where trading does not take place without a sufficient number of traders but those traders cannot be attracted without liquidity. The same most likely applies to attracting foreign investors. The shares must have a sufficient trading potential and base liquidity from domestic investors before the first foreign funds start trading spontaneously. After this, network effects start to pull in more trade. In any case, having a sufficient liquidity is a prerequisite for *retaining* foreign ownership. If trading in shares decreases, irrespective of reason, the interest of foreign investors will also diminish.

Hypothesis H7, that the foreign investor proportion is higher for shares that have had good past returns, can be supported by the full data set. Also, Hypothesis H4, that foreign investors prefer companies with good return on equity, finds significant evidence, but the effect is opposite to the hypothesized direction. Contrary to the hypothesis, in this data set foreign ownership is actually lower in firms with high ROE.

More insight on these two variables can be found when the data set is split between exchanges. In Oslo there is no evidence of past returns having a significant effect on foreign ownership, whereas ROE is significant. In Helsinki, the situation is the opposite, with ROE playing no role while past returns have significant effect. Investors have clearly been more aggressive in Helsinki than in Oslo. The result probably highlights the nature of these two exchanges during the technology boom. Helsinki was marketed as a good price performance exchange, and this has attracted foreign capital. Worth factoring in at the same time is that Oslo has been a lot less volatile and that there have not been spectacular rise and fall swings like those in Helsinki. Therefore, neither has there been a clear time when such momentum investing could have been applied.

The impact of the technology boom is further analyzed by splitting the shares in Helsinki by time: before the technology bubble, during it, and afterward. There are a few caveats in this approach. First, it is *ex post* quite easy to see when a bubble has burst, but saying when it started to inflate is a bit trickier. In this analysis, the time before the bubble is deemed to end in about August 1997 and the bubble ends at February 2000. Secondly, it takes time for aggregate ownership to build up, so judging which of the three time spans tells most about investor behavior is not clear-cut. Some action is probably seen during the time concerned, but probably the situation just afterward (the “end result”) is more indicative of the actual phenomenon. Finally, when the time examined is made shorter, accuracy of analysis may drop simply due to there being less available data.

Despite these challenges, the analysis does show some indication of what happened. In the time before the bubble, foreign ownership in Helsinki was almost purely an issue of size. Past raw returns also seem to show a significant effect, but the effect is negative (foreign

ownership is higher in firms that had not done so well) and significance disappears when returns are compared to the index returns. The results probably mirror the economic situation in Finland in the early '90s, when the Finnish economy was recovering from a recession. Past returns of all companies were poor, and foreigners who had invested in the largest firms also took the toll. Looking at the situation just after the technology bubble, however, shows that foreign ownership started to build up in firms with good returns during the bubble. Foreign ownership after the bubble is significantly higher in firms with good past return (especially when compared to index returns) and significantly lower in firms with high ROE. Share turnover does not seem to have a significant effect, though. This probably implies that foreign investment was flowing into firms with good share performance but those firms had poor financial performance and were forgotten after the hype period.

Support for Hypothesis H5, that foreigners would prefer companies with a good quick ratio, cannot be found. Therefore, this data does not support the finding of Dahlquist and Robertsson (2001a) that foreign investors would invest in firms with large cash positions. Such cash positions would be visible in the quick ratio.

More importantly, also Hypothesis H3, that foreign investment could be improved with a foreign listing, must be rejected. Foreign listing does not result in a higher proportion of foreign owners, when all else is controlled for. This, too, goes against the findings of Dahlquist and Robertsson. They claim that the inclusion of share turnover and foreign listing as variables in the regressions diminishes the effect of size. These regressions show the opposite: firms with a foreign listing do not attract more foreign ownership when size is controlled for. This may be a result of the two exchanges studied being more

international than Stockholm. Helsinki, especially, has taken deliberate steps to attract foreign investors, to bring in more trade. If the company is large and a potential target, investors will find it, irrespective of trading location. The “profile” of the exchange does not have an effect either; companies have similar levels of foreign ownership irrespective of whether their business belongs to a sector for which the exchange is known. Hypothesis H2 as well must be rejected.

Finally, one must recall that aggregate foreign ownership is always dependent on previous holdings. Despite there being a lag of six or 12 months to ownership, previous ownership is a significant determinant of foreign ownership in month t . This is simply because a large mass of investors, just as all foreign owners in aggregate, does not change its ownership pattern and investment preferences in a random fashion from one month to another nor can the companies completely change the ownership structure.

3.6 Summary

This chapter has looked at the preferences of foreign investors by measuring what kinds of firms are overweighted by foreign investors, as compared against domestic investors, in two national exchanges. The results confirm the findings of previous research that foreign ownership is highest in large companies and in companies whose shares have a high turnover. The results also show that under certain circumstances foreign investors employ momentum investing and this results in an overweight of shares that have performed well in the past.

In contrast to the findings of Dahlquist and Robertsson (2001a), foreign listing and turnover do not here absorb the effect of size. Size has been a dominating factor in the two exchanges and has affected foreign investor choices irrespective of liquidity and a cross-listing. Neither is there evidence in this data set that, as was found by Kang and Stulz (1997), foreign investors would overweight firms with good accounting performance. Firms that have cross-listed and have an ADR program do have a higher foreign ownership, but this effect is absorbed by size.

Several explanations for the differences can be offered. This study uses a data set that is much more detailed than those employed in the previous studies, and that thus offers a new kind of accuracy. However, as is highlighted by the comparison between the two exchanges studied, much of the difference can be attributed to the differing nature of the exchanges. The companies in this study most likely differ from the companies in previous studies from the cross-listing perspective. Both in Finland and in Norway, almost all cross-listers are large firms. There is not really any variance in the data for studying how cross-listing affects the ownership of small firms. This study also shows that momentum is not universal. It can be found in exchanges with high volatility in the index, such as Helsinki, but not in exchanges with a relatively flat price performance, such as Oslo.

Also, this chapter has discussed the nature of aggregate foreign ownership and its changes over various periods. The data shows that monthly foreign ownership numbers are very autocorrelative and short-term changes exhibit close to random-walk performance. However, for longer periods, from six months onward, the fundamental differences between investment targets can be seen.

The strong size effect also means that small companies will find it difficult to widen their ownership base, even if they cross-list. The size factor cannot be overcome by measures available to them, including cross-listing on a more liquid market. Even if they do cross-list, the result may be that no trade takes place in the new exchange and the impact on ownership base is minimal. This is exactly the situation in which mid-sized Finnish companies have found themselves when they have tried to make a cross-listing in Western European and North American markets. If these companies wish to improve the liquidity of their shares, a well-functioning national exchange is still the primary method.

4 FOREIGN INITIAL PUBLIC OFFERINGS OF EUROPEAN COMPANIES²

4.1 Introduction

While European investors may in the past have had problems in finding investment targets, companies have faced a similar problem in acquiring financing. Up until the late '90s, the availability of financing was one of the largest obstacles for the expansion strategies of European growth companies (Graham Bannock & Partners 1994). Compared to their American counterparts, most European companies at that time experienced that neither institutional investors nor the public market in general in Europe showed interest in the new breed of growth companies. As a consequence, many small companies seeking a public market ended up making their initial public offerings in the United States, mainly on the NASDAQ Stock Market.

A positive development in the equity culture in Europe, free capital flows across borders, a common currency, and consistent regulations could potentially relieve European entrepreneurial companies from the constraints of the availability of equity capital in their home country. The question is crucial, as it may determine not only how mature European companies can attract foreign capital but also how regional differences affect the development of venture capital and financing for small firms. There is a strong correlation

² A paper co-written with Markku Maula and based on this chapter was presented at the 22nd annual international conference of the Strategic Management Society in 2002. It won the Booz Allen Hamilton/SMS PhD Fellowship Runner Up prize and has been published in the *Journal of Business Venturing*.

between the functioning of secondary markets and availability of venture capital (e.g., Black and Gilson 1998). Because of the correlation, 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, this improves the possibilities of companies for raising financing through cross-border transactions, including public offerings of shares. In this chapter, I consider what kinds of companies have so far taken the opportunity to make a foreign public market listing. So far, listings by European companies on other European public markets have been rare, especially when it comes to the initial offerings. Regardless of the European Union and its striving for a common financial market, national borders do matter a lot in Europe. But, as the European capital market becomes more unified, the number of foreign initial public offerings should increase. The characteristics of the previously foreign-listed companies quite likely give an indication of the determinants of future listings and the success factors leading to such development.

Foreign initial public offerings in the context of this chapter are defined as equity issues where a company makes its initial public equity offering in a country that is not its country of incorporation. In this chapter, I limit the research to initial offerings and leave out other offering types, such as seasoned offerings and cross-listings. This is done for several reasons. First among these, I want to study exchanges as an exit vehicle for investors. Some seasoned offerings do involve the sale of existing securities, but most of them are used to raise capital for a listed company through new issues. Similarly, cross-listings may not involve any sale of securities at all, just the expansion of trading locations. Secondly, blue chip companies use cross-listings and especially multi-listings to serve a large

institutional investor base or raise large amounts of capital. A typical profile for a multi-listing in Europe has been that of the privatization of old state-owned companies. As these issues differ quite a bit from the venture-capital-backed and small and medium-sized firms that are studied here, such situations can be considered outliers. Plenty of quality research can be found on the impact of cross-listings on foreign exchanges (see, e.g., Foerster and Karolyi 1999).

I study the determinants that have either allowed or forced companies to pursue listing on a foreign exchange. Of particular interest is the ownership structure of the firms – entrepreneurs, corporate investors, or venture capitalists – prior to the IPO. The focus is on the owners because they are the most influential stakeholders in a listing. Because my interest is cross-border transactions, I look especially at the split of ownership between foreigners and domestic investors before the IPO.

Given the focus of the study on the determinants of foreign IPOs and related theoretical arguments, “foreignness” is considered here a binary variable. An IPO is either foreign or 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 divergent from the focus of this study and would require a different type of research design. As is shown later in a description of the data, foreign IPOs are, overall, very rare. There may be only one specific country-to-country pair in the whole 10 years of data, which makes it hard to draw statistical conclusions. Given the “rare event” nature of foreign IPOs and the theoretical focus on international-entry-capability-related firm-level determinants of foreign IPOs, this study relies on a case-control research design and an appropriate logistic regression method for rare events. The data collection from

prospectuses with the case-control design would be problematic in the dyadic analysis needed in explaining the choice among foreign stock exchanges. Given that the focus of the analysis is on factors influencing foreign initial public offerings rather than selecting from among various foreign stock exchanges, the focus on the binary measure of foreign IPOs is justified.

On the basis of the findings and prior research on international entrepreneurship and financial markets, I derive implications for entrepreneurs and investors concerning the opportunities that open through foreign equity markets. The study contributes to the newly emerging stream of literature on foreign IPOs (e.g., Blass and Yafeh 2001; Bruner, Chaplinsky, and Ramchand 2004; Ejara and Ghosh 2004; Kadiyala and Subrahmanyam 2002) by being the first to examine firm-related determinants of foreign IPOs. The findings have important implications also for public policy.

The rest of the chapter is structured as follows. Section 4.2 provides a literature review and develops the hypotheses. Section 4.3 discusses the data and methods I use in the empirical analyses, and section 4.4 then reports the results. Finally, Section 4.5 provides a summary of the material.

4.2 Theoretical Background and Hypotheses

4.2.1 Introduction

Foreign IPOs are a niche area in the research of finance. 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 used so seldom. Especially in

Europe, where European integration is expected to increase the flow of capital across borders and cross-border investments, the question is quite relevant. It may lead to a determination of not only how European companies can attract foreign capital but also how regional differences affect the development of stock exchanges and venture capital.

The existing body of research on foreign IPOs takes a primarily financial perspective, identifying differences in stock exchanges as drivers of foreign IPOs, but the focus of empirics is primarily on post-IPO differences in trading and share price performance. This study takes a more strategic perspective and focuses on *ex ante* factors explaining the decision of new ventures to become publicly listed on a foreign stock exchange. I draw the hypotheses from five relevant streams of research: market segmentation, IPO motivation, cross-border listings, venture capital, and international entrepreneurship.

4.2.2 Market Segmentation

Market segmentation theory is a widely studied and used theory comprising, mainly, two hypotheses that explain differences in investment patterns in different geographical areas. These two hypotheses are the *investor recognition hypothesis* (Merton 1987) and the *segmentation hypothesis* (Stulz 1981). The investor recognition hypothesis states that investors invest in only shares they are aware of, creating an unequal allocation of capital. Due to investment barriers, investors own many more local country shares than what is implied by the portfolio theory (Stulz 1981, Kang and Stulz 1996, and Grinblatt and Keloharju 2001).

Problems of information availability are especially severe in the case of IPOs where the companies involved 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. In a large market, analysts are more likely to receive serendipitous information (information acquired by luck or with no cost) and thus experience economies of scale that lower their overall cost of acquiring information.

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. The benefits of lowering the cost of information should be 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 many times cited as the reason for overseas listing. Pagano, Röell, and Zechner (1999) 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, I hypothesize that the same applies for straight foreign IPOs and that being in a high-tech business proxies well the difficulties of information transfer that issuers encounter.

Hypothesis H1 Companies in high-tech industries are more likely to seek foreign initial public offerings.

4.2.3 General Motivations for Initial Public Offerings

As has been mentioned above, reasons for IPOs that have been cited in the previous literature can be roughly categorized into four groups of reasons, relating to: 1) capital

availability and exit (e.g., Pagano, Panetta, and Zingales 1998); 2) widening of the shareholder base and obtaining and controlling of liquidity (e.g., Foerster and Karolyi 1999); 3) signaling of quality (e.g., Blass and Yafeh 2001); and 4) spillover effects, corporate image, and other motives (e.g., Modén and Oxelheim 1997).

Though each public offering has its own balance of different motives, in most cases an IPO is primarily made to raise financing needed to fund growth and to supply an exit vehicle for existing investors. Company size always plays some role in IPOs. Large companies may seek a public market rather than a private market simply because private institutions cannot provide the amounts of cash that are sought. 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. Those companies that were dual-listed in the 1990s were predominantly large teleoperators and privatizations that needed to tap into several equity markets to gather the amounts of money they sought. In foreign IPOs the situation may be the same; large companies may be more likely to seek larger markets from abroad. I therefore hypothesize as follows.

Hypothesis H2 The size of the venture is positively correlated with the likelihood of a foreign initial public offering.

When shares are sold to raise capital, valuation is naturally an important issue, especially in the case of venture capitalist exit. The existence of different appeal in different markets may lead companies to “seek better prices” in areas where the IPO market is “hot.” As originally shown by Ritter (1984), IPOs happen in cycles that are strongly correlated with the market index of the target market. If the timing of hot periods in different countries

does not fully coincide, owners of the firms may seek foreign markets purely to get the best price. Consequently, well-performing exchanges should attract listings. To test this, I assume that a market is performing well if it performs better than the world market in general, and I use the following hypothesis.

Hypothesis H3 *The target market of those companies that have undergone a foreign IPO has performed better than the world market in the period immediately preceding the IPO.*

Signaling effects of IPOs have been studied to some extent, and previous results indicate that signaling has an impact on the choice of listing venue. Making a listing on a market that has strict financial disclosure requirements can signal the quality of the investment. The resulting transparency lowers the cost of capital, and listing requirements provide a certification effect, which may make firms actually seek “tough” exchanges in terms of disclosure, despite the costs (e.g., Saudagaran and Biddle 1992). The question is relevant to foreign listings because there are relatively large differences in disclosure requirements among the various exchanges. Blass and Yafeh (2001) argue that the main reason Israeli high-tech companies seek a listing on NASDAQ is to distinguish themselves from the possibly lower-quality companies on the national market. Because previous research indicates that signaling is relevant mainly for high-tech companies and high-tech companies are already hypothesized to be more likely to make foreign listings, I do not construct a separate hypothesis for signaling in this study but assume our previous hypothesis on high-technology companies covers this.

Apart from pure capital-raising needs, a range of other motivations for making an IPO exists. However, the implications for a foreign issue are many times mixed. Obtaining

liquidity is a natural and commonly quoted listing motive. Liquidity in general is a widely studied area, and there is ample research on different dimensions of liquidity, its effect on prices, and differences between exchanges (see, e.g., Demsetz 1968, Ho and Stoll 1983, and Amihud and Mendelson 1986). However, it is known from these studies that the liquidity of a small company's shares is generally low everywhere. The choice of one exchange over another does not necessarily improve liquidity. Without an *ex post* comparison of the possible alternatives, it is very difficult to measure the actual impact.

Other motives for an IPO, such as marketing, personnel incentives, and managerial status, exist. Product market spillover effects (i.e., the positive effect on business from publicity gained through listing) are the most widely studied (e.g., Holmén and Högfeldt 1999). However, there remains very little systematic research in this area. Typically, this reason is cited in survey studies, and the results from these are very mixed. For example, in some studies publicity is found to be a major determinant, while in others it is not. Unfortunately a non-biased *ex post* measure of product market spillover effects is very hard to define. First, it is nearly impossible to obtain market by market split of revenue that would indicate how sales in a certain market have developed on account of the IPO. This is typically company-internal data. Further, in a cross-sectional study, the period of impact per company varies considerably. Where one company may see an increase in sales immediately (e.g., in consumer electronics), for others there may be a lag of several years (e.g., in construction). Finally, the end result tells us nothing about motivation. It could be that a cross-listing has not had any effect on sales, but this does not say that such was not the original intention of the management. Studying such motivational factors would

require a completely different research methodology from the one used in this study, essentially in-depth case studies with interviews of the management.

4.2.4 Cross-Border Listings

Research into cross-border listings can easily be categorized as a research stream of its own. This is because the studies of cross-border listings typically focus on a distinct research topic: how a dual listing possibly increases share liquidity and lowers the cost of capital.

Globalization should decrease the cost of capital (Stulz 1999). Because of lower cost of capital, companies should have the incentive to take action in attracting foreign investors. Foerster and Karolyi (1999) show in their study of companies with an NYSE dual listing that exposure to domestic market risk is significantly reduced by the listing. The listing is associated with only a small increase in global market risk and foreign exchange risk, resulting in a net reduction in the cost of equity capital.

Cross-listing studies show that cross-listings are done mostly by large multinationals (e.g., Foerster and Karolyi 1999). Experience from international operations should make it easier to gather financing abroad, since international operations in general 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 serving the investor base better than does that of a company operating at purely national level. A multinational should also have better investor appeal in multiple countries, allowing it to sell shares in the market it wishes. I therefore hypothesize as follows.

Hypothesis H4 *Foreign IPOs are more likely to be made by companies with operations and facilities in more than one country.*

4.2.5 Venture Capital

Pre-IPO financing decisions should have a major impact on the later exit decisions of new ventures. Venture capital and public offerings have a symbiotic relationship with each other. Black and Gilson (1998) argue that the existence of an exit market drives venture capitalists to the market, which in turn increases IPO activity. A well-functioning IPO market not only provides an exit vehicle itself but also improves prices in other types of venture capital transactions, since public companies offer credible and measurable benchmarks.

Venture capital is inherently a local business. Venture capitalists typically invest in companies that are physically close to them. They also syndicate with other venture capitalists near them (Bygrave and Timmons 1992). Research shows that venture capitalists work as producers of information (agents) and through this provide a certificate to the market concerning the quality of the company (Bygrave and Stein 1990, Fried and Hisrich 1994, Megginson and Weiss 1991). Barry et al. (1990) argue that there is less underpricing of venture-backed IPOs than one might expect, as a consequence of the monitoring and certification role performed by venture capitalists. Venture capital investors, through their selection and monitoring, certify the quality of their portfolio companies in initial public offerings.

Foreign venture capital investors who are known well in their home market, may help to lower the boundary for going public abroad by reducing the liability of the foreignness of

the portfolio company (Mäkelä and Maula 2005). A potential home market bias on the part of the foreign venture capitalist would also drive the portfolio companies toward a listing in the home market of the foreign investor. I therefore hypothesize that foreign venture capital is positively associated with foreign public offerings.

Hypothesis H5 *Ownership by foreign venture capital investors increases the likelihood of a foreign initial public offering.*

4.2.6 International Entrepreneurship

International entrepreneurship is receiving increasing attention in entrepreneurship research (Zahra and George 2002). However, very little effort so far has been put into studying the correlation between entrepreneur location and subsequent listing location. In the literature review of Zahra and George, none of the studies of internationalization explained the choice of entrepreneurs to go public in foreign markets.

In the same way as financial investors, the founding entrepreneurs and parent corporations are, though large in terms of ownership and control over the firm, investors among 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 (1999) note that cross-listings are culturally dependent. Companies tend to cross-list in countries geographically or culturally close to their country of incorporation. Therefore, I form the following hypothesis.

Hypothesis H6 *Ownership by foreign corporate investors and entrepreneurs increases the likelihood of a foreign initial public offering.*

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 international experience: work experience and education. Research shows that past experience and contacts are likely to be a major determinant in the perceptions of managers. Bloodgood, Sapienza, and Almeida (1996) and Burgel and Murray (1998) find a positive and significant association between foreign work experience of the managers and the degree of the new venture's internationalization. Burgel and Murray (1998) also find that a higher percentage of managers of companies that internationalized had worked for a foreign company at home. Accordingly, I hypothesize that the foreign experience of the members of the management team correlates positively with the likelihood of foreign IPOs.

Hypothesis H7 Foreign experience of the management team increases the likelihood of a foreign initial public offering.

4.3 Methods and Data

4.3.1 Empirical Setting

The empirical setting of the present study is on foreign initial public offerings of European companies between January 1991 and April 2001. Apart from IPOs by Israeli companies on NASDAQ, foreign IPOs are made very seldom. On average, 4.1% of all IPOs that took place between January 1991 and April 2001 were foreign (see Table 4.1 below). Europeans make cross-border listings only a little more often; on average, 5.7% of

European IPOs have been foreign over this span of time. Of these European foreign IPOs, over 20% have been made in nearby countries that are culturally similar and use the same language as the company's home country.

In terms of business, the sample of foreign IPOs is relatively heterogeneous. High technology firms such as deCode Genetics from Iceland or Union Technology from Italy represent the largest group within the sample, but their proportion is not significantly different from the proportion of high technology firms in the sample of domestic IPOs. Rather, the share of high technology firms highlights the general trend of the IPO market in this particular time period. Other companies represent a very wide variety of industries, ranging from travel and tourism (Debonair Airways, Royal Olympic Cruises) to gambling (Casinos Austria International), ecommerce (LetsBuyIt.com), watches (TAG Heuer), and clothing (Fila Group).

The United States is by far the most common target country for foreign issues. Because the United States is known to have an efficient financial market, this indicates that foreign IPOs may take place in cases when domestic markets are underdeveloped. This assumption is supported by the fact that the proportion of European IPOs in the United States has constantly decreased. As European IPO markets started developing in the late '90s, they offered a viable alternative to the United States, thus reducing the need to make an IPO there. The number of foreign IPOs did not decrease during the time under consideration, indicating a high number of cross-border IPOs within Europe.

Table 4.1 Home countries and target IPO countries of European companies making a foreign IPO between January 1991 and April 2001³

Country of origin	Target country															Grand total	
	Australia	Austria	Belgium	Brazil	Denmark	EASDAQ	France	Germany	Greece	Italy	Norway	Spain	Switzerland	United Kingdom	United States		
Austria	1					2	13						1				17
Belgium						8	1									4	13
Canada							1							1	46		48
Denmark										1					2		3
France						3									10		13
Germany									1						4		5
Greece															4		4
Hungary															1		1
Iceland						1											1
Ireland (Rep.)																	1
Israel						2	2							5	8		15
Italy						2	1	5					3	9	78		98
Luxembourg						3	2								5		10
Netherlands						1	1								4		5
Poland		1	1			3	7	1				1			10		24
Portugal															1		1
Spain						1					1				1		2
Sweden										2					3		5
Switzerland								4							4		10
United Kingdom			1		1	3		1							29		35
United States		1	1	1		23	10	4	1		3	1	1	9			17
Total	1	1	3	1	1	23	10	37	2	1	3	1	6	24	214		329

³ "Country of origin" is the country of incorporation of the company undergoing the IPO, as marked in the SDC database. The target country is the country where the exchange of listing resides. If the company lists in multiple exchanges in multiple countries, the exchange marked by SDC as primary exchange is taken as the target exchange. Listings in trading systems such as SEAQ have been discarded. However, if a company lists simultaneously in a trading system and an exchange, the exchange in question is considered the target exchange.

Israel is clearly a case of its own in terms of foreign listings. Since this is a study of European IPOs, Israel is excluded but nonetheless does offer a good contrasting view to the topic. Discussion about the motivations and reasons behind Israeli IPOs can be found in the work of, e.g., Rock (2001) and Blass and Yafeh (2001).

4.3.2 Data

In this analysis explaining foreign IPOs, I built the data set first by leveraging the SDC Platinum database and then collecting a unique database of ownership and business data from prospectuses of individual companies. Prospectuses were downloaded from the Pioneer database from Perfect Information. Stock market data was collected from Thomson Financial's Datastream. I also corrected for some well-known problems of SDC and the possible selection bias resulting from the availability of prospectuses.

One problem with the SDC material is that it records all security issues with common stock as separate entries in the database with the same identifier⁴. There is an "original IPO" flag that should identify the first IPO made by the company, but it is not reliable. Therefore, the database obtained from SDC may contain multiple entries if the company has had seasoned offerings. This problem is remedied by selecting only the first occurrence of the relevant CUSIP number and the corresponding database entry. However, because the database has a finite history, not all seasoned issues may be in SDC Platinum,

⁴ Other widely known problems with SDC include that it misclassifies seasoned offerings as IPOs and double-counts IPOs under different names (Ljungqvist and Wilhelm 2001). Additionally, the database has a false number of post-issue shares outstanding; the wrong number of over-allotment shares; and several mix-ups in recorded sales, assets, EPS, etc. (some corrections to these can be found from Jay Ritter's home page, at <http://bear.cba.ufl.edu/ritter>). All known corrections are made to the large data set before use. The effects of possible errors in SDC are further minimized by collecting the main data set from other sources.

and the database may contain some entries for which the original IPO has actually been made before this date. The database is, therefore, cleaned up manually whenever information about the status of the company can be obtained from some other source (a prospectus or Datastream). Additionally, all entries concerning investment trusts and closed-end funds are removed.

The resulting data set contains basic information on all IPOs in North America and Western Europe between January 1, 1991, and April 26, 2001. From this data set, I create detailed data on representative samples of foreign and domestic issues. After the cleanup, the data set of IPOs contains 7,975 unique entries. Of these, 7,447 (93.4%) are domestic, 199 (2.5%) are dual, and 329 (4.1%) are foreign.

Given the need to collect data manually from prospectuses for both foreign IPOs and domestic IPOs of European companies, a case-control design (King and Zeng 2000) is used. I extract two subsets of this data set for closer scrutiny and collect prospectuses for them 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 all 163 foreign IPOs recorded by SDC. The control data set contains 106 random issues made from European companies in their home exchange. These are chosen from the set of 2,699 entries in the SDC data set. All needed data is then collected for each IPO from individual prospectuses.

4.3.3 Variables

The *foreign IPO* dependent variable is a dummy variable indicating whether the company made its IPO in a market that resides outside its home country. The variable takes the

value of 1 if the IPO is made in a foreign stock exchange and 0 otherwise. The home country in this case is the country where the core of operations and the headquarters is located. Furthermore, if the company becomes listed 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, are not considered foreign exchanges.

High-technology focus is measured as a dummy variable expressing whether the company is operating in a high-tech industry. The classification is made using the SIC codes recorded in the SDC data. *Size of the venture* is operationalized as the market capitalization at the time of the IPO. Market capitalization is calculated as the product of the number of shares outstanding after the issue and 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 the natural logarithm.

Management foreign experience is a dummy variable indicating 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 biographies found in prospectuses. Venture capitalist board members' foreign experience is not included, since venture capitalist influence is measured separately. International operations also are measured as a dummy variable. A company is classified as having international operations if it reports having facilities and a significant number of employees in more than one

country. Significant in this case means that the country has over 10% of all company employees. Sales offices are not considered foreign facilities unless they employ a majority of the employees.

Foreign pre-IPO ownership is measured in two categories: foreign venture capital investors and foreign entrepreneurs or corporate investors. The information was collected from the prospectuses of the companies. For both categories, total ownership for the category is the sum of the ownership of the three 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 because 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 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 control variables I measure the timing of the IPO by way of dummies marking the period. The time studied is split into five periods in which the IPO may have taken place (1991–1992, 1993–1994, 1995–1996, 1997–1998, and 1999–2001). The 1991–1992 period is used as the base category.

4.3.4 Rare-Events Logistic Regression

The dependent variable in this study is a binary variable indicating the choice of the venture to go public abroad instead of in its home market. Because of the collected extensive list of foreign IPOs, it is known that the proportion of foreign IPOs is small:

only 5.7% of all European initial public offerings in the data. Therefore, the data can be classified as rare-events data, binary dependent variables with significantly fewer ones (“events”) than zeroes (“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, 2001a, 2001b). To strike a balance between collecting a sufficient number of zeroes while still being able to collect enough explanatory variables with the given resources, I employ the “rare-events logistic regression” methodology developed by King and Zeng.

I correct the logistic regression by weighting the sample, as the proportion of events in the whole population is known. This results in a *weighted exogenous sampling maximum-likelihood estimator*. Instead of maximizing the more traditional log-likelihood, the weighted model maximizes

$$\ln L_w(\beta|y) = w_1 \sum_{\{Y_i=1\}} \ln(\pi_i) + w_0 \sum_{\{Y_i=0\}} \ln(1 - \pi_i) = - \sum_{i=1}^n w_i \ln(1 + e^{(1-2Y_i)X_i\beta}),$$

where the weights are $w_1 = \tau/y$ and $w_0 = (1-\tau)/(1-y)$, τ denotes the population fraction of events, y denotes the sample fraction of events, π is the probability that the measured variable Y_i takes the value 1, and β is the vector of explanatory variables. In practice, this computation is performed with the ReLogit plugin for Stata. For details and discussion of the method, see King and Zeng (2000).

4.3.5 Control for Selection Biases

The availability of prospectuses in the Pioneer database can be considered close to random. There is, however, a potential selection bias in the availability of prospectuses, since it is more likely that prospectuses from certain countries, from larger IPOs, and from IPOs happening closer to the end of the 1990s can be found. The random sampling used to obtain the control data set corrects some of these problems. However, the situation is not corrected fully. The number of IPOs in earlier years is so small that random sampling results in too small a control sample for those years. Therefore, manual selection is used also for the control sample in years 1991 to 1993. To control for this potential bias in the sample, I apply the Heckman (1979) two-stage selection model to obtain unbiased estimates. Later analytical methods assume case-control design (endogenous stratified sampling). In the Heckman model, a correction factor is included in the main regression equation to account for biased selection.

To correct the bias, suppose that one seeks to estimate a regression equation in the form

$$Y_{1i} = X_{1i} \beta_1 + U_{1i},$$

where $i = 1, \dots, I$ but there is data missing for some observations. The Heckman model assumes that there is some sample selection rule that determines whether data is available or not. Therefore, the regression equation for the sub-sample of available data becomes

$$E(Y_{1i} | X_{1i}, \text{sample selection rule}) = X_{1i} \beta_1 + E(U_{1i} | \text{sample selection rule})$$

$i = 1, \dots, I$, and the first $I_1 < I$ observations have data available for Y_{1i} . The two-stage method estimates this sample selection rule, yielding a second equation, which explains the sample

selection. Assuming that data on Y_{1i} is included in the sample if $Y_{2i} \geq 0$, the regression equation becomes

$$E(Y_{1i}|X_{1i}, Y_{2i} \geq 0) = X_{1i}\beta_1 + E(U_{1i}|U_{2i} \geq -X_{2i}\beta_2).$$

To include in the substantial equation the probability that data is part of the sample, a correction factor is calculated. Assuming the joint density function $h(U_1, U_2)$ is normal, one can use the results

$$E(U_{1i}|U_{2i} \geq -X_{2i}\beta_2) = \frac{\sigma_{12}}{(\sigma_{22})^{\frac{1}{2}}} \lambda_i,$$

$$E(U_{2i}|U_{1i} \geq -X_{2i}\beta_2) = \frac{\sigma_{22}}{(\sigma_{22})^{\frac{1}{2}}} \lambda_i,$$

where

$$\lambda_i = \frac{\phi(Z_i)}{1 - \Phi(Z_i)},$$

in which ϕ and Φ are, respectively, the density and distribution function for a standard normal variable and

$$Z_i = -\frac{X_{2i}\beta_2}{(\sigma_{22})^{\frac{1}{2}}}.$$

λ_i is the inverse Mill's ratio and serves as the correction factor. It is a monotone decreasing function of the probability that an observation is selected in the sample. For further discussion, see Heckman (1979).

I estimate the correction factor by 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). The results of the procedure indicate that the possible unavailability of prospectuses did not significantly change the results.

4.4 Results

Table 4.2 below shows the distribution of foreign IPOs over time by European, Israeli, and North American companies. What is remarkable is the diminishing importance of the North American market as European equity markets have developed. However, as can be seen from Table 4.2, time has not decreased the number of foreign IPOs but increased them, showing the growing importance of European cross-border IPOs and the improved functioning of internal European exit markets.

The special nature of Israeli IPOs can clearly be seen in the table (Israeli companies are not included in the regressions, which focus on European companies). Though IPOs by Israeli companies account for only 1.3% of all IPOs, they make up over 30% of foreign IPOs. The table also clearly shows that foreign IPOs are still more an exception than a rule (only 4.1% of all IPOs). Foreign IPOs by U.S. companies are especially rare, and the United States is by far the most common target country for a foreign IPO, highlighting the fact that if capital is available in the home country companies rarely go abroad.

Table 4.2 Foreign IPOs by European, Israeli, and North American companies from 1991 to 2001

	Number of foreign IPOs as % of all (all foreign) IPOs		Europe		% of all foreign IPOs		% of all European IPOs		Israel	% of all foreign IPOs		% of all Israeli IPOs		N. America	% of all foreign IPOs		% of all N. American IPOs		Number of European companies listing in N. America		% of European foreign IPOs		
1991	6	1.4%	1	16.7%	2.0%	2	33.3%	100.0%	2	33.3%	100.0%	3	50.0%	3	50.0%	0.8%	0.8%	1	100.0%	1	100.0%	1	100.0%
1992	16	2.9%	7	43.8%	16.7%	5	31.3%	83.3%	5	31.3%	83.3%	4	25.0%	4	25.0%	0.8%	0.8%	6	85.7%	6	85.7%	6	85.7%
1993	26	3.4%	10	38.5%	16.7%	10	38.5%	100.0%	10	38.5%	100.0%	6	23.1%	6	23.1%	0.9%	0.9%	9	90.0%	9	90.0%	9	90.0%
1994	20	2.4%	9	45.0%	3.7%	6	30.0%	100.0%	6	30.0%	100.0%	5	25.0%	5	25.0%	0.9%	0.9%	8	88.9%	8	88.9%	8	88.9%
1995	26	3.6%	14	53.8%	7.7%	6	23.1%	85.7%	6	23.1%	85.7%	6	23.1%	6	23.1%	1.1%	1.1%	13	92.9%	13	92.9%	13	92.9%
1996	55	5.0%	27	49.1%	8.7%	20	36.4%	90.9%	20	36.4%	90.9%	8	14.5%	8	14.5%	1.0%	1.0%	19	70.4%	19	70.4%	19	70.4%
1997	46	4.8%	23	50.0%	6.1%	14	30.4%	87.5%	14	30.4%	87.5%	9	19.6%	9	19.6%	1.6%	1.6%	14	60.9%	14	60.9%	14	60.9%
1998	20	4.3%	17	85.0%	4.7%	0	0.0%	0.0%	0	0.0%	0.0%	3	15.0%	3	15.0%	3.0%	3.0%	7	41.2%	7	41.2%	7	41.2%
1999	53	5.4%	28	52.8%	6.2%	16	30.2%	100.0%	16	30.2%	100.0%	9	17.0%	9	17.0%	1.8%	1.8%	9	32.1%	9	32.1%	9	32.1%
2000	58	5.3%	28	48.3%	4.0%	19	32.8%	100.0%	19	32.8%	100.0%	11	19.0%	11	19.0%	2.9%	2.9%	4	14.3%	4	14.3%	4	14.3%
2001	3	2.7%	2	66.7%	2.3%	0	0.0%	0.0%	0	0.0%	0.0%	1	33.3%	1	33.3%	4.0%	4.0%	1	50.0%	1	50.0%	1	50.0%
Sum and avg. %	329	4.1%	166	50.5%	5.8%	98	29.8%	91.6%	98	29.8%	91.6%	65	19.8%	65	19.8%	1.3%	1.3%	91	54.8%	91	54.8%	91	54.8%

Table 4.3 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 rare-events logistic regressions of the determinants of foreign IPOs of European companies are presented in Table 4.4. 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 H1, 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 H2. The results additionally provide support for H3, that the international experience of the top management team influences the likelihood of a foreign IPO. Hypothesis H4, that international operations increase the likelihood of a foreign IPO, is supported. Internationally operating corporations have a stronger tendency to make an initial public offering abroad.

In hypotheses H5 and H6 I predicted that foreign pre-IPO ownership increases the likelihood of a foreign IPO. Providing support for these hypotheses, the 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 entrepreneurial ownership and foreign venture capital are positively correlated to a foreign IPO, providing support for H5 and H6. 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 are.

Control variables show that time has no significant effect on the tendency to make a foreign IPO. In Model 2 I add a control for potential sample selection 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 seen with Model 1.

4.5 Summary

I set out in this chapter to analyze factors influencing the decision of ventures to become public in a foreign exchange instead of their domestic stock exchange. I 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 become smaller. The strategic options for financing young European ventures have clearly improved within Europe.

Both foreign corporate or entrepreneurial ownership and foreign venture capital is associated with a foreign listing. There are three possible causes for this, which are open for further research: 1) the tendency of companies with an international strategy to seek international contact from the beginning (“the born global companies”), 2) the home bias of entrepreneurial and corporate owners, and 3) the certification effect of venture capitalists on public markets.

Table 4.3 *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 of 163 foreign IPOs and 105 of 2,699 domestic IPOs)

Table 4.4 Rare-events logistic regression tests of the determinants of foreign IPOs by European companies

	Hypothesized direction	Dependent variable: Foreign IPO?	
		Model 1	Model 2
<i>Independent variables</i>			
Hypothesis H1: High-tech industry	+	.893 ** (.378)	.805 * (.388)
Hypothesis H2: Size of the venture	+	.220 * (.109)	.204 * (.112)
Hypothesis H3: International experience of the top management team	+	.723 * (.384)	.677 * (.378)
Hypothesis H4: International operations	+	.670 * (.406)	.708 * (.421)
Hypothesis H5: Pre-IPO ownership by foreign venture capital investors	+	1.815 + (1.184)	1.717 + (1.218)
Hypothesis H6: Pre-IPO ownership by foreign entrepreneurs or corporate investors	+	2.105 *** (.644)	2.161 *** (.602)
<i>Control variables</i>			
Timing of the IPO, years 1993–1994	+/-	.757 (1.239)	1.013 (1.289)
Timing of the IPO, years 1995–1996	+/-	1.160 (1.096)	1.303 (1.120)
Timing of the IPO, years 1997–1998	+/-	1.415 (1.076)	1.388 (1.094)
Timing of the IPO, years 1999–2001	+/-	.500 (1.046)	.162 (1.114)
Lambda (sample selection correction factor based on inverse Mill's ratio)	+/-		-2.807 (2.842)
Constant	+/-	-9.216 *** (2.204)	-3.394 (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

Support for the hypotheses that high-tech firms and large firms have a greater propensity for foreign IPOs was also found. In line with arguments related to international entry capability, I found that international experience on the part of the top management team and international operations are important determinants of foreign IPOs. I also found that international *ex* foreign corporate or entrepreneurial ownership and foreign venture capital are associated with a foreign listing.

For entrepreneurs and venture capitalists, the results show that European exit markets have developed in a positive way and, in addition to national exchanges, cross-border exit markets are available in different European countries. For “born global” companies, the positive correlation between foreign listings and foreign ownership can be comforting. Foreign venture capital investors and corporate investors may help to lower the barrier to going public abroad, further enhancing the globalization strategy. Reputable foreign venture capitalists can and do add value. There exists research suggesting that interorganizational relationships may be valuable for the internationalization of new technology-based firms (Artz, Ireland, and Hitt 1999; Lu and Beamish 2001; Shrader 2001; Zacharakis 1997; Zahra, Matherne, and Carleton 2003).

A foreign listing is never a final objective in itself. Entrepreneurs looking to perhaps reside in their home country need to consider the long-term costs and benefits of foreign listing from the beginning. After the IPO, the public owners mostly consist of citizens of the country where listing takes place. Quite considerable resources are required in serving a foreign investor base ranging from holding capital market days with investors to following local accounting and legal requirements. Resource requirements may drive several other factors, such as the location of firm headquarters, seriously affecting the staff composition

and the contact base of management and thus further influencing the whole strategy of the firm. Foreign listed firms must therefore continuously assess the benefits of maintaining the foreign listing and compare them to a listing in the national exchange.

This study has analyzed the characteristics of firms that perform a foreign listing at the time of the listing. The quantification of long-term costs and benefits of a foreign listing versus a domestic listing would require the comparison of direct listing costs and indirect share price performance during a significant time span after the IPO. This analysis has been left outside the scope of this study but is clearly an interesting topic for further research.

5 OFFERING LIQUIDITY FOR FOREIGN INVESTMENTS – THE CASE OF EASDAQ

5.1 Introduction

The EASDAQ stock exchange was focused on rapidly growing small and medium-sized European enterprises. It was established in 1996 by venture capitalists, investment bankers, securities dealers, and investment institutions to improve the exit market for venture-backed European companies. In the later 1990s, EASDAQ tried to develop its own position among the national stock exchanges in Europe, other specialist exchanges, and alternatives from the United States. The project did not succeed as planned. Press and analysts claimed EASDAQ never succeeded in creating sufficient trading volume for investors and companies. As trading revenues slumped, a decision was made to discontinue EASDAQ as an independent exchange and sell the operations to NASDAQ. In spring 2001, EASDAQ was transformed into NASDAQ's European branch, NASDAQ Europe. Pressed by the economic downturn and poor performance of high-tech stocks, NASDAQ Europe was shut down in 2003, finally ending the EASDAQ story. Because it started from zero and remained independent and quite small, EASDAQ now offers a very good case for studying how an exchange develops and how liquidity is generated.

Liquidity is the core service an exchange offers. Without sufficient trading, the revenues of an exchange are limited and financial stability is doubtful. To obtain sufficient trading, the exchange must offer enough shares to trade, and they are made available through admissions. Companies, on the other hand, should seek those listing locations where they

achieve the highest liquidity for their shares. However, whether those locations are markets where total liquidity is high is another matter. A large exchange increases the probability of trade, but individual companies may also find that their offering vanishes in the mass and does not get the attention required to attract traders.

The focus of EASDAQ was on small and mid-sized technology companies. Small companies traditionally suffer from infrequent trading, whatever the market. This is a fact well known by investment professionals and academics. It is a problem academics have tried to circumvent in their methods for decades (see, e.g., Dimson 1979). Asset liquidity is the result of a multitude of factors, some of which can be influenced by the exchange and some that cannot. It could be that the liquidity for EASDAQ was not a problem of the exchange itself but related to the profile of the companies. This is a traditional “chicken and egg” problem for exchanges. Without sufficient total liquidity, companies may steer clear of admissions, making it difficult for the exchange to attract companies that would improve liquidity. But the causality is not self-evident, and using total liquidity as an excuse for not listing in a particular location may not be justified. There are examples of otherwise quite illiquid national exchanges where, despite the overall level of trading, some individual companies are still traded very frequently. A well-known example is the Finnish mobile phone maker Nokia. Though Nokia’s shares are listed on large liquid exchanges like the New York Stock Exchange and London Stock Exchange, most of Nokia’s trading still takes place on the Helsinki Stock Exchange, where trading volumes are significantly lower otherwise.

The purpose of this study is to examine whether listing location significantly affects liquidity when other effects are controlled. The objective is to control and isolate the

factors that affect liquidity, extract the effect of actions an exchange can take, and then make an objective evaluation of the claim that potential admission targets would have experienced thinner trading on EASDAQ than somewhere else. Nationality and the role of foreign investors play a role again. The concentration of Nokia's trading in HEX is most likely not a coincidence; trading takes place in the country of incorporation. If nationalistic issues are topical, they should be visible in EASDAQ's case since EASDAQ was profiled as an exchange without any particular home country.

5.2 A Brief History of EASDAQ

The idea of a pan-European stock exchange started to receive public attention in the early 1990s. Partly as a result of the stock market crash in 1987, the early '90s saw the IPO market in Europe pretty much "frozen" (Muzyka 1998). Companies with a short trading history simply had no place to offer their shares to the public since they were not accepted on national exchanges and no alternatives existed. Early attempts to create stock markets for small technology companies failed in Europe because of conflicts of interest with existing exchanges and insufficient investor appeal (Graham Bannock & Partners 1994). As a consequence, most small European companies ended up making their IPOs in the United States, mainly on NASDAQ.

An important consequence of the lackluster demand for and supply of public offerings was the slow development of venture capital in Europe. A nonexistent public exit market limited investor exit possibilities and resulted in lower exit prices. Prices in trade sales were similarly depressed. Venture capitalists had little negotiating power against trade buyers because a credible source of comparable prices was missing. Despite the efforts to

change the status quo, large national exchanges did not seem to move quickly enough to improve the situation. Therefore, the European Venture Capital Association started its own initiative, which developed into the EASDAQ project (Freeman 2001).

The EASDAQ project played a key role in the development of new alternative stock exchanges in Europe in the 1990s. Many claim it was the project that ignited the process of creating alternatives to national exchanges in Europe. Several exchanges, including AIM (1995), Nouveau Marché (1996), Neuer Markt (1997), and techMARK (1999), were specifically created to attract European companies and investors across national borders. Similarly, a new breed of “New Market” lists was established by many smaller national exchanges, including the Developing Companies Market (DCM) of the Irish Stock Exchange and the NM list of the Helsinki Stock Exchange. Meanwhile, large exchanges started to explore the possibility of joining in larger, cross-border entities. The possibility of cross-border trading and the formation of a true pan-European or even global exchange led to a series of joint ventures, link-ups, and mergers – or at least attempts to create them. Examples include the failed joint venture “iX” between the London Stock Exchange and Frankfurt Stock Exchange; the failed hostile takeover bid for the London Stock Exchange by the Swedish OM Gruppen; the merger between the Helsinki Stock Exchange and Stockholm Stock Exchange; and the Euronext joint venture involving the Paris, Brussels, Lisbon, and Amsterdam stock exchanges.

The aim of EASDAQ was to become the market for aggressive European growth companies. It, however, had a global focus, and companies from, e.g., Israel, Canada, and the United States could seek listing there. From its inception, EASDAQ was intended to be a “pure” pan-European exchange with no apparent ties to any particular country or

legislation. It was modeled after NASDAQ and offered the special feature of serving as an initial step toward a listing on NASDAQ. The listing requirements were very similar to those of NASDAQ, and EASDAQ-specific rules were kept at a minimum. This had the consequence that most regulatory issues such as offering rules were still governed by the laws of each country involved or by the laws of Belgium, since Belgium was where EASDAQ's offices were physically located. This exchange tried to position itself from the beginning as a market for somewhat larger companies to avoid competition from AIM, Nouveau Marché, and then forthcoming Euro.NM.

Objectives in terms of admissions were set high from the beginning. The key strategy for reaching high admission numbers was dual-listing European companies that were already listed on NASDAQ (Freeman 2001). Rulebooks were similar, and no additional charge was levied for these companies. There was a specific rationale for keeping EASDAQ independent from individual European countries and instead linking to NASDAQ. It was believed that single countries in Europe would not have sufficient investor mass to support a specialist exchange in the long run (Freeman 2001); NASDAQ was supposed to be an easy source for initial listings and investors would be attracted from all countries.

On November 27, 1996, EASDAQ went live with the trading of Dr. Solomon's. After the initial enthusiasm, harsh reality soon showed that the exchange fell short of its admission targets. The initial strategy of attracting NASDAQ-listed companies failed, for EASDAQ had no special value proposition that would have made EASDAQ listing a top priority for these companies (Freeman 2001). The rules were so similar to those set by NASD that some companies decided to list directly on NASDAQ because they needed to go to the same trouble of complying with the rules in any case. Further, trading on EASDAQ was

seen as costly and cumbersome because of inefficient settlement and clearing systems, which made attracting investors difficult (Bealer 2001).

In addition to admission numbers being small, total trading on the exchange was lower than expected. As a consequence, companies started being cautious about listing on EASDAQ. They feared that trading in their shares would also remain low. Some companies started to exploit the possibility of either cross-listing their shares somewhere else or completely delisting from EASDAQ.

Figure 5.1 below shows some of the major events in EASDAQ's history, together with admission numbers and share indices for EASDAQ and its competitors⁵. The figure clearly shows how companies are reluctant to complete IPOs when market indices are declining. However, no significant increase in admissions occurred on EASDAQ in January to March 2000, when the market for new listings was really hot. This is, presumably, because of competition, especially from the German Neuer Markt. It is clear that EASDAQ remained far behind its admission targets.

Due to these difficulties, the history of EASDAQ as an independent exchange ended officially on March 30, 2001.

⁵ The indices have been modified to show comparative volatility so that January 2, 1998, is the base point where each index is scaled to 100.

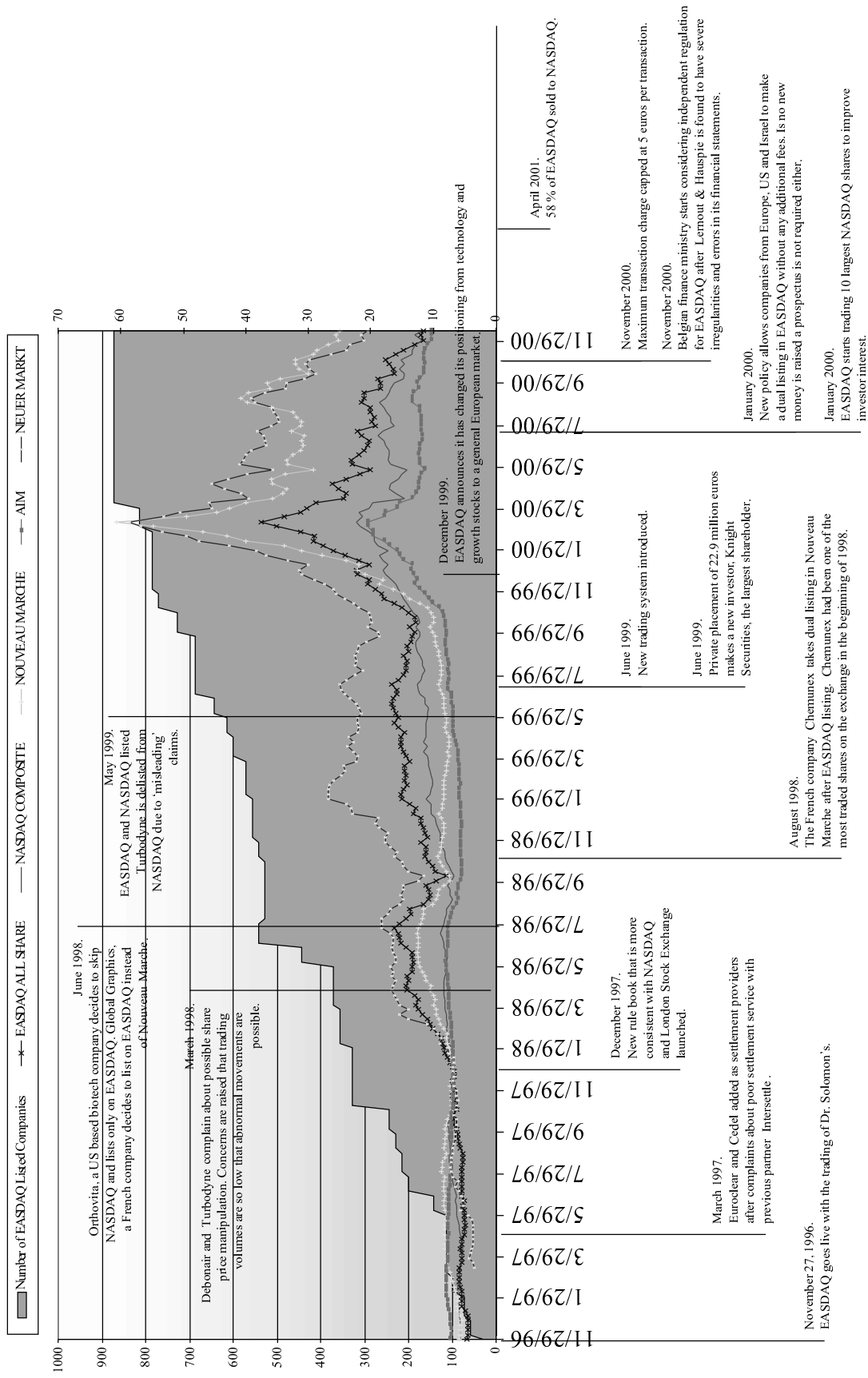


Figure 5.1 Major events in EASDAQ's history

5.3 Theoretical Background and Hypotheses

5.3.1 Measures of Liquidity

Studies of liquidity belong to the stream of market microstructure research that started developing in the late 1960s and early 1970s (see, e.g., Demsetz 1968 and Tinic 1972). Market microstructure research studies events of the micro level of financial intermediation and financial markets, including price formation, trading, and liquidity.

Liquidity itself is a cornerstone of financial intermediation. Liquidity can be defined as the possibility to transform assets into consumption goods at minimal transaction cost (Benston and Smith 1976). Because of the ambiguity of this definition, one can take multiple views on liquidity, which include 1) width, meaning how wide the spread is between bid and offer quotes (i.e., what variable transaction cost is involved in trading assets); 2) depth, also referred to as “liquidity ratio,” meaning the number of shares that can be traded at any given price; 3) immediacy (i.e., the speed at which transactions can be processed and executed); and 4) resiliency, the speed at which prices return to their initial levels after a block trade by a large investor (Harris 1990). Lippman and McCall (1986) combine these views into one definition, used also in this study: A liquid asset is an asset that can be sold quickly, at a predictable price and with low transaction costs.

Because liquidity can be defined in many ways, it can also be measured with multiple variables. In the academic world, bid-ask spreads, or the width, have had a critical role in measuring liquidity since Demsetz’s pioneering paper in 1968. The paper made liquidity and spreads almost synonymous in academic literature. Demsetz shows that the costs of

transacting decline as the transaction rate increases. Liquidity received an economic meaning for companies in 1986 when Amihud and Mendelson published their liquidity hypothesis model (Amihud and Mendelson 1986). The model predicts that, in equilibrium, gross expected returns are a concave increasing function of quoted bid-ask spreads. This means that improved liquidity, when measured as narrower spreads, is a sign of lower required cost of capital. The Glosten and Milgrom model (Glosten and Milgrom 1985) offers an explanation. Narrow spreads are an indication that the intermediaries are fairly certain of the value of the asset. Market-makers set narrower spreads when they see themselves as well-informed in comparison to the clients they serve. Therefore, their perceived risk and consequent required cost of capital are lower.

Unfortunately, data on accurate and actual bid-ask spreads is often difficult to obtain. Most databases show only the spread quoted by market-makers, not the actual spread that prevails on the daily market. Quoted spreads may not give an accurate picture of trading. In some cases – e.g., when the limit book is shallow – the quoted spread may be wide but the actual spread narrow, which gives a distorted view of the trade (Pagano 1996, Huang and Stoll 1996). In situations with multiple market-makers, such as the dual market-maker structure of EASDAQ, the true spreads also may be distorted. Competition between the market-makers should decrease the spreads a bit as dealers try to set better prices and attract trade (see, e.g., Branch and Freed 1977). But Ho and Stoll (1983) show that increasing the number of market-makers may actually increase the spreads instead of lowering them. The reason is that with multiple market-makers, the trader can submit orders to many of them. The market, therefore, stands ready to trade more shares at a specific quoted price, allowing for wider spreads. If market-makers further include

exchange commissions in their quoted spread, the spread may not be a measure of the true cost of providing immediacy but, instead, just show the charge of the market-maker for executing orders (Grossman and Miller 1988). And, finally, if there is a requirement to give quotes only in certain “ticks,” – e.g., one quarter of a dollar – securities with a low unit price may have larger spreads relative to the price simply to give the dealer room to maneuver (Tinic 1972, Branch and Freed 1977). Accordingly, doubt has been cast on the robustness of quoted bid-ask spread (see, e.g., Brennan and Subrahmanyam 1996 and Eleswarapu and Reinganum 1993).

Consequently, alternatives for spreads were developed in the 1990s. Luckily and in line with Demsetz’s theories, the interrelationship between spreads and volume also works the other way around; trading volume is a decreasing function of transaction costs (Epps 1975, Karpoff 1986, Bolton and von Thadden 1998). Hu (1997) and Datar, Naik, and Radcliffe (1998) develop a liquidity measurement based on turnover rate (number of shares traded as a fraction of the number of shares outstanding) as an alternative for spreads. They show that this proxy for liquidity is directly and negatively correlated with stock returns and thus has a meaningful economic value similar to that of spreads.

Following the models of Hu and of Datar, Naik, and Radcliffe, I use the turnover of shares in this study as the measure of liquidity. The case of EASDAQ shows a market-maker-driven exchange that reports in databases the quoted spreads, which, as discussed above, have their shortcomings. Additionally, I use share price volatility as one determinant of liquidity, which may cause problems when spreads are measured. Volatility has been found to have a significant effect on liquidity (see, e.g., Grossman and Miller 1988), in terms of both spreads and turnover. But the direction of the effect for these two measures

may in some cases be opposite. Volatility is a sign of uncertainty. When new, unexpected information reaches the market, trading increases as investors take new positions. But when market-makers set their quotes, the higher the implied company-specific risk and the bigger the batch of shares, the higher the risk of adverse price change and the wider the spread (Glosten and Milgrom 1985, Kyle 1985). As Demsetz indicates, this trading should eventually push spreads lower, but initially the two measures of liquidity point in opposite directions. Volatility in some thinly traded shares may also be a result of the bid-ask spread. If trading takes place at bid level, sometimes at ask level, this may be seen as a volatile price change if the spread is wide. This is called the “bid-ask bounce.”

Turnover has its weaknesses also. It proxies transaction costs, immediacy of trade and price predictability but, unlike spreads, it does measure any of these directly. Turnover ratios may also suffer from heteroscedasticity. However, what makes turnover especially suitable for this study is that it is directly related to the transaction fees charged by the exchange. These fees – that constitute a major part of the revenue of an exchange – are charged per executed transaction and are almost linearly related to revenue. While turnover only proxies the characteristics sought by investors, it measures directly the success of the market place, which is the core topic of this study.

5.3.2 Hypotheses

There should always be some liquidity available, due to the idiosyncratic need for liquidity and speculative trading (Karpoff 1986). This “normal” level should, however, be affected by several factors measured in this study. The factors include:

- uncertainty of share price, in this study proxied by volatility;

- knowledge of the company in question and availability as shares to trade, in this study measured with market capitalization;
- concentration of shares and availability of freely tradable shares, in this study measured with free float;
- flow of capital to certain markets, and especially industries, due to momentum trading, in this study proxied by industry classification and location; and
- exchange-specific factors and flow of capital to or concentration of trade in a certain country, in this study measured with location.

These factors lead to the research hypotheses as described below.

Volatility has a significant effect on liquidity (Grossman and Miller 1988). The main source of volatility is uncertainty resulting from either lack of information or new and unexpected information reaching the market. New information increases trading volume as investors change their expectations about the value of the assets. This volatility can arise from the general volatility of the markets (changes in interest rates, oil price fluctuations, political climate, etc.) or the volatility of individual shares. The higher the speculation and the greater the asymmetry in information, the higher the trading volume, as can be seen especially clearly in IPOs (Stoll 1989, Reese 1998). Therefore, the following hypothesis is formed.

Hypothesis H1 The higher the volatility in share price, the higher the turnover, irrespective of exchange.

Share trading is very much dependent on the characteristics of the company involved. Company size and share ownership structure have an especially strong effect on liquidity. Large companies usually have wider investor recognition, which brings more potential new traders to the market. There are typically also more owners in a large company, resulting in a larger pool of sellers. The more dispersed the ownership, the more bidders there should be for the security and the more likely it is that the security gets traded and has high turnover (Demsetz 1968).

Hypothesis H2 The higher the market capitalization of the traded company, the higher the turnover.

Trading cannot take place unless there are shares to trade. If essentially all shares of the company are owned by a few insiders, a situation that typically prevails in family-owned companies, change of ownership through active trading seldom takes place. Therefore, the higher the proportion of shares that are freely floated on the market, the more trade should take place.

Hypothesis H3 The higher the free float of a share class, the more turnover there should be.

The EASDAQ exchange was created because its founders believed Europe had latent demand for investment, especially in “hot” industries of that time such as telecommunications or biotechnology but was lacking trading locations for them. If this is true, then the fulfillment of this latent demand should show as increasing capital flows to these industries as new companies get listed and trading locations open. Capital is used for trading which in turn should be seen in the turnover of shares. If this assumption is true,

then certain industries should experience higher turnover than others when capital is being invested. This leads to the following hypothesis.

Hypothesis H4 *Share turnover is dependent on the industry in which the firm operates.*

Finally, there should be exchange- or location-specific factors that affect share trading. These include the number of traders present at the market, trading costs, market-making activity, and general public knowledge of and trust in the trading location. I therefore hypothesize as follows.

Hypothesis H5 *All else being equal, the average turnover of a particular type of share differs in different trading locations even when the locations are considered liquid, modern exchanges that list similar companies.*

5.4 Research Method, Data Sources, and Data Collection

5.4.1 Research Method

To create a comparative study of liquidity on EASDAQ, I carry out a cross-sectional study over a time span covering EASDAQ's independent operations. The study compares companies listed only on EASDAQ to a reference sample of some 450 similar companies listed in France, the U. K., Belgium, Italy, and Austria. The countries have been chosen such that they are the home countries of companies listed on EASDAQ. This comparison is chosen to measure whether there are nationalistic differences in trading activity between a "home exchange" and a "foreign exchange" such as EASDAQ. Data is recorded for

1996–2000 and pooled into 53 periods of four weeks (20 trading days) that are each analyzed individually.

A list of all 67 shares listed on EASDAQ, together with listing dates, was obtained from EASDAQ, and shares are grouped into the following categories: a) shares of companies that were listed on EASDAQ and had no other listing, b) shares of companies that obtained a dual listing on EASDAQ after an IPO somewhere else, and c) shares from dual IPOs where the company was simultaneously listed on EASDAQ and some other exchange. Shares in the first category are then used in the cross-sectional study.

5.4.2 Data Sources

The main source of data for the study is Datastream from Thomson Financial. Datastream is used for daily pricing and trading data for shares. I augment this database with ownership information from Bloomberg. The EASDAQ activity, events, and changes in the exchange are tracked by using the LEXIS NEXIS news database from Reed Elsevier Inc.

Daily trading data is averaged into monthly values⁶. In Datastream, the daily data obtained is automatically adjusted to be consistent with capital issues. Averaged daily data also allows for more accurate prediction of the true state of the security in case it is infrequently traded (i.e., an end-of-month value may be a misleading one if on that date no trading has taken place). Averaging reduces the amount of data to be analyzed and also

⁶ Technically, a month is 20 consecutive days of trading.

removes the biasing effect of non-trading, possible outlying values, and the effect of differing turnover on different days of the week (see, e.g., Foster and Viswanathan 1990). If the company made its initial public offering during the six years studied, the effect of an IPO, which is seen as abnormal volatility and turnover, is removed by excluding the first month of data after the IPO.

I then obtain comparable companies from Datastream by selecting all equities that a) have a market capitalization roughly equal to that of companies on EASDAQ, b) have the same industry classification as those companies on EASDAQ, and c) are listed in countries of incorporation of companies listed on EASDAQ. Market capitalization is measured in euros at time of listing. Home country and MSCI industry classification are obtained for EASDAQ companies from Datastream. Changes in market capitalization are controlled in the regression with panel data analysis.

The selection procedure yields a list of 498 companies (including those listed on EASDAQ). The database is cleaned up before further processing, as follows: 32 companies are excluded because Datastream does not record all data items required, and 28 companies are deleted because they have been dually listed for the whole period. A further six companies are excluded because they have been dually listed for such a long time that the time of relevant single listing would be very short. Finally, those companies that have incomplete information (typically missing ownership data) are dropped before regressions. The final data panel consists of 343 companies and 8,231 observations. Since the analyzed period covers the whole 53 trading month history of EASDAQ and companies become listed at various point in time during the period, most companies do not

have a full trading history that would cover the whole period. On average 24 trading months with full data are recorded per company.

Average market capitalization in the sample is 250 million euros, ranging from the high of 8.8 billion to as low as 1 million. On average half of the shares are freely floated. While proportions vary somewhat over time, firms from the U. K. represent the largest group (on average 43% of firms) and firms from France the second largest (33%). 33% of the companies are engaged in software business, 18% offer computing services, and 17% are pharmaceuticals.

5.4.3 Model Specification

Turnover, market capitalization, and volatility are heavily skewed variables. There are a large number of small companies and only a few larger ones, there exist a few very volatile periods while others are very stable, etc. A logarithm is therefore used to normalize the distributions of these variables. Table 5.1 shows the operationalization, sources, and calculation of variables.

The dependent variable of the regression is the natural logarithm of turnover (trading volume in euros divided by market capitalization). The independent variable is the location of trading (marked with dummies), and control variables include the natural logarithm of market capitalization, natural logarithm of price volatility, industry classification indicated with dummies, and free float of shares.

More formally, the regression model is

$$LN(TO_t) = \alpha_t + \sum_{k=1}^5 \beta_{kt} LOC_{kt} + \beta_6 LN(mcap_t) + \beta_7 LN(vol_t) + \sum_{l=8}^{14} \beta_{lt} IND_{lt} + \beta_{15} float_t,$$

where LOC_{lt} is a dummy marking the location of listing in period t , TO_t is turnover in period t , $mcap_t$ is market capitalization in period t , vol_t is the volatility of a share during period t , IND_{lt} is a dummy indicating the company's industry classification in period t , and $float_t$ is the proxy for free float in period t .

Table 5.1 Operationalization of the dependent and independent variables in regressions of the determinants of share liquidity

Data type	Source and code	Frequency	Explanation
Dependent variable			
Log of turnover	LN (Vol * Price / M_cap)	Daily, averaged over 20-day periods	Calculated share turnover
Independent variable			
Country (Hypothesis H5)	Datastream (GEOGC)	Once	Location of trading
Control variables			
Log of market capitalization (Hypothesis H2)	LN(M_cap)	Daily, averaged over 20-day periods	Natural logarithm of company market capitalization in euros
Share price volatility (Hypothesis H1)	LN(StDev(Price))	Calculated over 20-day periods from daily data	Standard deviation of daily price changes during the period
Industry classification code (Hypothesis H4)	Datastream (INDG)	Once	Datastream classification of the industry
Percentage of free floated shares (Hypothesis H3)	Bloomberg (TOP_SHAREHOLDER_PERCENT_SH)	Once	Percentage of shares not owned by main shareholders and that are traded in public
Variables used in calculating others			
Closing price of share	Datastream (P)	Daily, averaged over 20-day periods	Price at closing, measured in the currency of the home market
Market value	Datastream (MV)	Daily, averaged over 20-day periods	Market capitalization of the company, in millions of local currency and of euros
Daily number of shares traded	Datastream (VO)	Daily, averaged over 20-day periods	Number of shares traded on a day, in thousands

The approximation is of free float based on the assumption that if the top shareholder owns a very large share, it is not likely that there are other large investors, strategic or otherwise, that would have a strong incentive to keep the shares and that the shares are “freely traded.” However, if the largest shareholder owns only a relatively small fraction of the company, say 10%, it is likely that there are at least two or three other investors with similar interest (e.g., the original founders) and not likely to actively trade the shares. Therefore:

Free float =
 100% - (1.0 * top shareholder share), if top shareholder share > 75%
 100% - (1.2 * top shareholder share), if top shareholder share > 50%
 100% - (1.4 * top shareholder share), if top shareholder share > 35%
 100% - (2.0 * top shareholder share), if top shareholder share > 20%
 100% - (2.5 * top shareholder share), if top shareholder share > 10%

5.4.4 Regression Type and Robustness

The regression over the unbalanced data panel is a cross-sectional time-series regression. It should be a random-effects model, since one can assume that omitted variables may vary with company and that some may vary over time. It could be that, for example, some company is traded more than others because it is considered a “hot pick.” Similarly, there can be periods where trading increases as an exchange in aggregate is considered potentially a high-return opportunity, increasing trading in all shares, but this interest may fluctuate over time.

To test statistically whether the assumption of random effects is justifiable, Breuch–Pagan and Hausman tests are run over the data. The large chi-squared value of 10051.28 from a Breuch–Pagan Lagrange multiplier with p-value < 0.0000 shows that variances of groups are not zero and a random-effects model is justified. The Hausman test produces a chi-squared value of 2.65 (p-value < 0.2662) indicating that the random-effects model is appropriate. Tests and regressions are run with Stata’s panel data analysis functions. These functions can handle unbalanced panel data and produce consistent estimates even when data is missing for some companies in some periods.

There is a tendency for trading volume to be autocorrelated (see, e.g., Foster and Viswanathan 1993). In general, trading volume should persist after an information event because some investors arrive “late” to the market and ignore the price changes that may have taken place prior to their arrival. This is because the need to trade created by new information is not fulfilled immediately (e.g., because of the need to amortize the costs of arriving to the market), and because of the need to re-contract after the initial trade

(Karpoff 1986). Averaging the trading volume over periods of 20 days should remove such autocorrelation, for it is assumed that a month is sufficient for trading activity to level. This is a relatively safe assumption, as re-contracting should be fulfilled within hours (or a couple of days in the worst case) in efficient markets. However, some autocorrelation in trading volume may still exist if capital flows to the market due to momentum effects. In times such as the technology boom, capital is invested over longer periods of time in a market as it “heats up.” This could result in gradually increasing trading activity.

Pooling turnover over all companies and comparing these pooled values over different months shows indication of such autocorrelation. Average turnover tends to rise and fall in trendlike fashion in certain periods. For this reason, the regression analyses are repeated with a first level autoregressive model. The regression coefficients and R^2 values obtained from standard and autoregressed random-effects models do not really differ from each other and are essentially the same. The overall R^2 for the model is 0.32. Therefore, the values reported below are from a standard GLS random-effects model.

Neither should heteroscedasticity of individual variables pose a problem. To remove possible heteroscedasticity in this study, all measures related to size are relative, not absolute, measures. I check possible heteroscedasticity in data by using residual plots. Studentized residuals are plotted against each independent variable. The residual plots do not show a reason for corrections to the ordinary least squares approach taken.

There is no significant correlation between the independent variables (all correlation coefficients are under 0.3), with the exception of free float dummies marking companies

from the U. K. and France. Companies in the U. K. seem to have a larger portion of their shares publicly traded than do companies from other countries (correlation coefficient: 0.56), while French companies have more concentrated ownership (correlation coefficient -0.52). This multicollinearity may cause problems. To control for multicollinearity between free float and listing in these two countries, I run a separate regression analysis with a sample in which companies from these countries have been removed. The magnitude and direction of variables, however, remains essentially the same as in the full data set; therefore, only the values for the full data set are reported.

5.5 Results

Table 5.2 shows the results from the panel data regressions. The results are in line with most of the findings previously reported in the literature and discussed in Section 5.3. More importantly, they confirm that listing location has a significant effect on liquidity even when company size, industry, free float, and share price volatility are controlled.

Supporting hypothesis H1, volatility has a significant impact on turnover and to a large extent determines how trading volumes develop. Trading is also more frequent in large companies, even when other factors are controlled and only the relative (market-cap-adjusted) turnover is measured. This confirms hypothesis H2.

Hypothesis H3 is supported as well. Irrespective of trading location, those firms with a large free float are traded more. What is interesting is that companies in the U. K. traded more but when free float, which is particularly high in U. K. companies, is included, the

significance of U. K. listing degrades. French companies generally traded less frequently, even when their concentrated ownership is accounted for.

Table 5.2 *Determinants of liquidity, coefficients from regressions – dependent variable LN(turnover)*

Variable	Hypothesized direction	Coefficient	Significance
Hypothesis H1: Volatility	+	.537	(38.08) ***
Hypothesis H2: Market capitalization	+	.199	(15.93) ***
Hypothesis H3: Free float	+	.989	(4.94) ***
Hypothesis H5: Trading location, the U. K.	+	.242	(1.76)
Hypothesis H5: Trading location, Netherlands	+	.854	(4.58) ***
Hypothesis H5: Trading location, Italy	+	.739	(3.87) ***
Hypothesis H5: Trading location, France	+	-.276	(-2.00) +
Hypothesis H5: Trading location, Belgium	+	-.258	(-1.24)
Hypothesis H4: Industry, Internet security	+/-	-.119	(-0.68)
Hypothesis H4: Industry, pharmaceuticals	+/-	-.082	(-0.66)
Hypothesis H4: Industry, telecoms equipment	+/-	-.016	(-0.06)
Hypothesis H4: Industry, telecoms services	+/-	-.328	(-2.07) +
Hypothesis H4: Industry, software	+/-	.056	(0.52)
Hypothesis H4: Industry, computing services	+/-	.008	(0.07)
Constant	+/-	-2.96	(-15.76) ***

*** p < .001, ** p < .01, * p < .05, + p < .10

There is no real evidence of industry classification having a truly significant effect on trading. Weak evidence exists that companies in telecommunication services traded less than others in general, but H4 cannot really be supported.

Finally, and most importantly, the hypothesis H5 that average turnover of a share is dependent on trading location can be supported. Share turnover was significantly lower for EASDAQ-listed shares than for similar shares on other exchanges. Turnover on EASDAQ was lower than that in the Netherlands, Italy, and – to some extent – the U. K. But, compared to the French small cap market, EASDAQ turnover was actually, on average, higher. One explanation for this could be that shares in French companies are from Euro.NM, where French small caps were listed. Trading on Euro.NM was mostly focused on Germany's Neuer Markt, which drew trading away from Belgium and France. The lower trading levels in Belgium are visible in the data, even though the effect is not significant.

5.6 Summary

The EASDAQ case is an interesting one to study in terms of what determines the success of an exchange. The basic ingredients for success were there from the beginning. The exchange was created by professionals and for professionals. Design and procedures were copied from successful exchanges abroad, and market-maker support was obtained. Still the exchange did not succeed as planned.

The study shows that an exchange is very much dependent on macro-level and company dependent-factors it cannot control, no matter how well the exchange itself is designed. These factors include general stock market performance, trading activity of the shares of individual listed firms, competition between exchanges and – as is discussed extensively in other chapters of this thesis – home bias of investors and issuers.

While revenue structure varies between exchanges, all stock exchanges derive their revenues primarily from three sources. The sources are fees from the trading of financial instruments, fees collected from issuers, and revenues from the sale of market information. All these revenue sources are dependent on the liveliness of the underlying market, which further builds on the products offered in the market. The primary method available to the stock exchanges for molding this marketplace is the creation of new trading products such as commodities, bonds, derivatives, or – as was the case for EASDAQ – shares of public firms.

For an exchange operating with EASDAQ's profile, the first hurdle to overcome is to create a sufficient mass of admissions. This typically happens through public offerings. The data shows that an ideal issuer is a large firm with most of its shares freely floated. In addition, it should rather operate in a high growth or even speculative business than a steady market in order to create volatility and trade. But as IPOs are inherently a cyclical phenomenon, the operations of the exchange rely heavily on market sentiment. Markets move in lockstep, and when a bear market sentiment spreads, IPOs do not occur in any exchange. Further, because trading in general is low for small cap companies, small cap exchanges are hit hardest. Timing is therefore crucial.

While EASDAQ may have been fairly successful in timing its founding to the early stages of the technology boom, hesitation among potential issuers was still caused by the newness of the exchange and the low overall trading volumes. The data from this study shows that this concern may have been unjustified in many cases. True, total trading volumes in EASDAQ were low, and some individual shares would probably have traded better on other exchanges. The results indicate that at least Dutch and Italian companies

did trade more in their respective home exchanges than they would have done on EASDAQ. But the data also shows that for French companies, choosing EASDAQ instead of Euro.NM in Paris was probably a wise choice, if only trading is considered. Firms from the U. K. should have been relatively indifferent in their choice between their local exchange and EASDAQ. This is confirmed not only by the data in this study but also by the opinions of many companies on EASDAQ. British Autonomy, one of the first companies to list on EASDAQ, has publicly indicated that “it was not that bad” (referring to the general public perception of low share liquidity). While EASDAQ perhaps had low total liquidity, when all other factors are controlled the liquidity still was quite acceptable for individual companies. Though EASDAQ never became a central pan-European trading place for rapidly growing stocks, some companies on the exchange probably would have done worse by choosing their own national exchange.

Trading data analyzed in this study does not offer further insights on the final reasons for avoiding an EASDAQ listing. One can only speculate them. Looking at other data in this thesis and the actions performed by various stock exchanges after EASDAQ’s demise, it however seems that a plausible explanation is that EASDAQ faced the home bias of the issuers as one major obstacle to both admissions and attracting investors. The majority of IPOs around the world, and particularly in Europe, are made on national exchanges and companies at IPO stage show home bias similar to that of investors at large (see Chapter 4). Compared to a “nationless” exchange like EASDAQ, national exchanges are in an advantaged position in terms of information and company recognition. Further, market segmentation for IPOs is high. In an IPO, 90% of the investor base a company typically gains is from the country of listing (Freeman 2001). Expectations of this bias can be seen

from the expansion activity of stock exchanges after EASDAQ's demise. National exchanges have lately been very reluctant to expand abroad organically by setting up new trading locations. Quite the contrary, essentially all expansion projects have dealt with mergers between existing exchanges. Instead of trying to create one multinational trading location from scratch, exchanges have merged operations and cut back-office costs while carefully retaining national lists.

EASDAQ tried to circumvent the problem of home bias by linking EASDAQ listing with NASDAQ admissions. EASDAQ served as an initial step towards a listing on NASDAQ and tried to cross-list European firms that were already listed on NASDAQ. This procedure effectively helps in easily picking those companies that do not show home bias since listing on NASDAQ essentially means preference towards some other exchange than the national exchange. But this strategy has two drawbacks. First, there was no real value proposition on EASDAQ versus NASDAQ itself. It is as if EASDAQ was looking for companies with limited home bias so that they skip their home exchange but still enough bias so that they prefer a European location to listing in the United States. Second, the approach overestimated the value of NASDAQ. As was shown in Chapter 4, once new listing locations in Europe started operating and could offer a suitable financing vehicle, the importance of NASDAQ listings decreased. It was not only EASDAQ that faced intensifying competition from these new initiatives but NASDAQ suffered also.

From an investor's point of view, EASDAQ never really reached the size required to draw in large masses of investors. EASDAQ eventually lowered trading fees in order to attract traders. But this is insufficient if the number of companies to trade on remains low. Being present on a market always creates some fixed costs that must be amortized over the

number of trades performed. This amortization is typically possible only when a large enough number of companies exists. By allowing companies to cross-list easily and by including NASDAQ-listed companies in its system for trading, EASDAQ tried to somewhat artificially increase its size in the eyes of the traders. These attempts did not succeed as planned.

Even though EASDAQ tried, the challenge of creating a true pan-European exchange still remains to be tackled. The exchange was created to serve rapidly growing companies that local exchanges could not or were not willing to serve. But when national exchanges took up the challenge, EASDAQ had little extra to offer.

6 FOREIGN OWNERSHIP AND INVESTMENT PERFORMANCE OF DOMESTIC INVESTORS

6.1 Introduction

Previous research shows that foreign and domestic investors as groups perform differently in a national exchange (Grinblatt and Keloharju 2000). If this is true, it may be possible for the worse performing group to benchmark against a better group and improve returns, assuming that information on holdings is easily and reliably available. If foreign investors are the group that performs better, knowledge of the foreign ownership of companies may carry important information to domestic traders. If, due to home bias, domestic investors will not improve their risk/return ratio by diversifying internationally, perhaps they could optimize their holdings in the domestic exchange. For this purpose, data on foreign holdings may reveal the moves of large professional institutions and help small investors in getting better returns by benchmarking these actions. However, no previous evidence exists concerning whether publicly available information can be used in practice for constructing a trading strategy. The study in this chapter builds one possible strategy and tests its success.

The policy on foreign investment is nowadays quite liberal in most Western countries. However, the monitoring of foreign ownership may still be quite strict. Especially in countries that have only recently removed foreign ownership restrictions, foreign investor ownership is tracked carefully and the information made public. One reason behind the tracking is that there may be a fear that opening the borders comes with the price of

potentially losing control over resources that may be important politically and for the domestic economy. Foreign owners may apply employment policies that are at variance with local culture, take advantage of local financial incentives given by local taxpayers, or shut down large operations with little concern for unemployment protection and personnel relocation.

This data has become of interest for investors in countries where the information is publicly and conveniently available. For instance, in Finland, eQ Online, a financial services provider that offers electronic trading services over the Internet, has included aggregate foreign ownership percentages and their monthly changes in the standard information package for investors. Skeptics may say that the information has been included only because it is free and easily obtainable enough that the marginal cost of adding it is minimal, even though it does not really add any value. But there is also a chance that this data might really be valuable in making investment decisions.

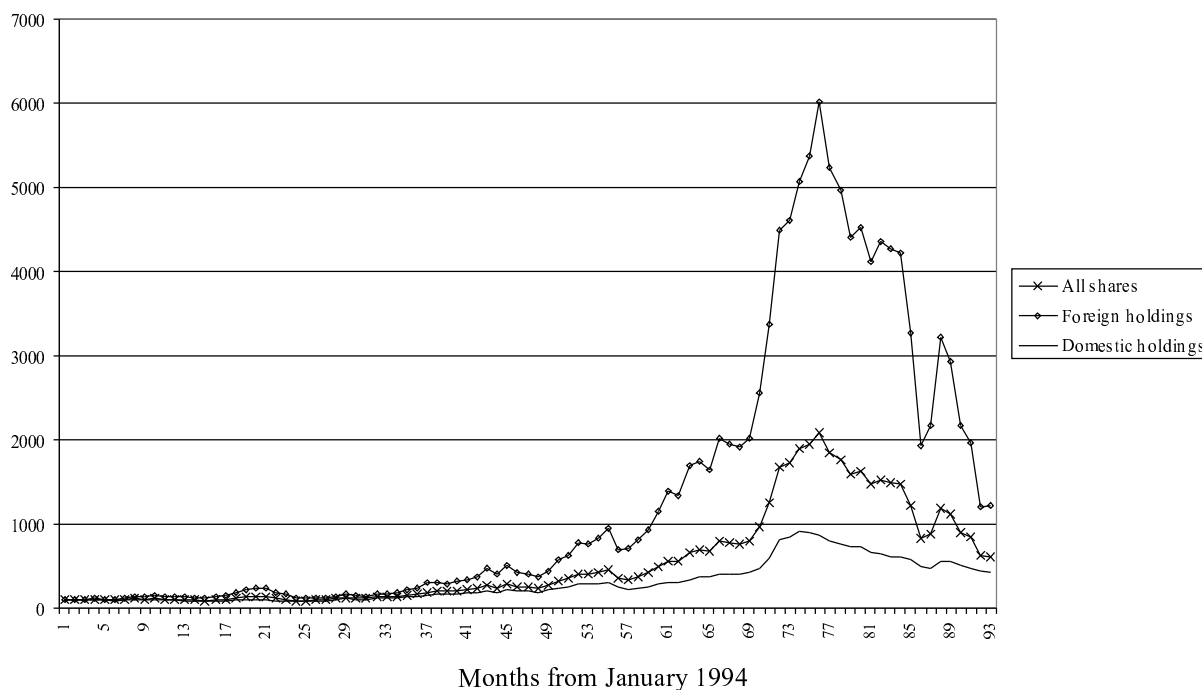
The simple analysis of performance in Figure 6.1 below shows clearly why the performance of foreign investors became such a hot topic in Finland by the late 1990s. The figure presents the performance of an “average buy-and-hold foreign portfolio” – a portfolio where shares are bought and held with the same percentages foreigners have used⁷. When we measure this way, foreigners performed clearly better than locals during

⁷ Portfolio performance is calculated as follows. If foreigners held 15% of the shares of company a, a sum corresponding to 15% of the equity value of that company is invested into those shares. Each month, the return from that share is compared to the appreciation or depreciation of the value for the shares. If there is a difference (due to, e.g., a distribution of dividend or change in ownership percentages), shares are sold or bought to again arrive in a portfolio that corresponds to the exact foreign ownership. Excess cash from sale of shares carries an interest and money borrowed to investment has an equal interest to pay.

the time studied. A local investor tracking this portfolio could have achieved excess returns.

One must bear in mind that the data does not show the holdings of individual investors, only the aggregate sum. Despite the fact that a large proportion of trading takes place among foreigners and is not reflected in the aggregate numbers, the figure gives an indication of potential returns available to foreign investor groups. In the 1990s, the fantastic rise in asset prices in the electronics and telecommunications industry occurred where foreigners had purchased large equity stakes. For Finnish investors, it seemed that the benefits of the increase went to those abroad, to a great extent.

Figure 6.1 *Return index of all shares, domestic holdings and foreign holdings, on the Helsinki Stock Exchange – months from January 1994 to October 2001 (January 1994 = 100)*



Calculations such as the one shown in Figure 6.1 have made many investors wonder whether one could construct a trading strategy based on these publicly available numbers. If one would invest in the same way as foreign professionals do, would that result in superior returns? ⁸

To get a different perspective on the issue, we could look at data from a different exchange for the same time period. If one looks at the performance in an exchange where electronics and telecommunications were not traded at large, like the Oslo Stock Exchange (OSE), the results look quite different. Figure 6.2 has been produced using exactly the same methodology as Figure 6.1 but with data from OSE.

Figure 6.2 *Return index of all shares, domestic holdings and foreign holdings, on the Oslo Stock Exchange – months from January 1994 to October 2001 (January 1994 = 100)*



⁸ Calculations like this must assume that the investor in case holds a small enough portfolio so that her investments do not change the balance between foreign and domestic investors.

As the figure above shows, the performance of foreigners is seen from a completely different angle when one looks at it in Norway. Comparing these two exchanges, Oslo and Helsinki, therefore quite likely removes some of the bias that would result from looking at one exchange only.

6.2 Theoretical Background and Hypotheses

Previous research gives indications that there may be economically valuable information embedded in the aggregate foreign ownership percentages. Grinblatt and Keloharju (2000) find that foreign investors in Finland are to a large extent professionally managed funds or investment banking houses. Dahlquist and Robertsson (2001a) confirm the same for Sweden. If so, the professionals should be good benchmarks for other investors. Chakravarty (2001) shows that institutional investors typically are informed traders that move the markets and set prices. Especially in a small market, this may be an advantage that results in superior returns. Further, a foreign owner is seldom a bad owner. Quite the contrary – under foreign ownership, companies typically perform better than under domestic ownership (Ylä-Anttila, Ali-Yrkkö, and Nyberg 2004). Therefore, high foreign ownership may be a sign of quality.

Cardwell (1997) makes a correlation analysis for Finnish publicly available foreign ownership percentages and trailing and leading returns between 1993 and 1996. He finds that there is a substantial correlation between one-year increase in foreign ownership and simultaneous share price increase (correlation in lagged one-year price change and the past year's foreign ownership change). However, high foreign ownership as such does not correlate with better future share price performance. This simple analysis does not show

benefits of such benchmarking but may indicate that a benchmarking strategy may actually mimic some other investment strategy, such as momentum investing.

If skilled institutional fund managers represent foreign investors, one should see their better skills in the performance of foreigners also. Grinblatt and Keloharju (2000) show in their study of Finnish trading data that the performance of foreign investors in the boom years was better than that of local households, even after controlling for possible momentum effects. Foreign investors' decisions to buy and sell seem to perform far better than those of local investors. Not everyone agrees with this. For example, Brennan and Cao (1997) argue that foreign investors should achieve inferior, not superior, performance because they are less informed than domestic investors. Trying to make intelligent decisions without a proper contact at local market level should not produce good results.

As was discussed in Chapter 3, foreigners typically follow momentum strategies and overweight shares that have had a good past performance. Dahlquist and Robertsson (2001b) further argue that the behavior of foreign investors in Sweden is actually an institutional bias instead of a nationality issue because most foreign investors are mutual funds. Indeed, Grinblatt, Titman, and Wermers (1996) show in their study of mutual fund trading strategies that 77% of the funds in their sample follow a momentum strategy. An interesting finding in their study is that, also, mutual funds typically systematically invest in past winners but do not systematically sell past losers. A closer look at the cash balance calculations behind Figure 6.1 (calculations not shown) also reveals an indication of this; in aggregate, foreign investors do not seem to have sold their shares during the strong market decline that started in March 2000. This would be in line with the previous findings concerning the behavior of foreign mutual funds.

Momentum investing is an interesting strategy, for some of the “street wisdom” and academic data indicates that momentum should beat many other common strategies, such as value investing (see, e.g., Dimson and Nagel 2001). Following the findings of Jegadeesh and Titman (1993), current academic practice also acknowledges that momentum does carry a value premium that cannot be explained by other previously found risk factors.

Unfortunately, it would be too easy to make such simplified statements about the performance of foreigners and momentum strategy. Conrad and Kaul (1998) find that momentum strategies in general work at a medium term (three to 12 months) while contrarian strategies work at very short (from a week to one month) or very long (from three to five years, and up) periods. At the end of the 1990s, the so-called technology bubble caused an unforeseen momentum in prices as the bubble grew. Naturally, foreign investors that followed a momentum strategy were conducting a very profitable strategy at that time. The results of Chapter 3 indicate that a correlation between past performance and the level of foreign ownership exists in this dataset also. But this correlation itself does not yet tell whether performance was better than what could have been achieved with some other strategy. Neither does it tell whether this strategy could have been followed in a way that provides additional premiums. For this purpose a comparative analysis is needed.

If individual domestic investors were to start to learn from foreign investors, how would they do this? The data available to them on everyday decisions is not as accurate as that used previously by, for example, Keloharju and Titman, who used transaction data. All that is available is the aggregate foreign ownership percentage data. Do the aggregate

numbers convey enough useful information that they can be useful in practice? And, finally, would this “foreign tracking portfolio” provide a risk premium not explained by already well-known risk factors? Relevant risk factors include at least those included in the Capital Asset Pricing Model (Treynor 1961, Sharpe 1964, Lintner 1965), the Fama–French three-factor model (Fama and French 1993), and the four-factor model (Jegadeesh and Titman 1993).

Consequently, in this study I formulate these questions into a research hypothesis as follows.

Hypothesis H1 *By constructing a portfolio that mimics the portfolio weights implied by the publicly available foreign ownership percentages, an individual investor could achieve returns better than those predicted by CAPM, the Fama–French model, or the four-factor model.*

The hypothesis is tested with a portfolio approach as explained in detail below.

6.3 Data Sources

Again, data is obtained from two Nordic stock exchanges, the Helsinki Stock Exchange and Oslo Stock Exchange. Comparison between exchanges helps in generalizing the results from this study. In Helsinki, the performance of foreign investors was very good in the 1990s, largely spurred by the technology bubble and telecoms industry in Finland. By contrast, the specific cyclicity of the oil industry meant that the Oslo Stock Exchange never experienced the technology bubble to the same magnitude as Helsinki did nor the rapid value appreciations.

The data on individual firms in this study uses the same core database used in the study discussed in Chapter 3 of this dissertation. For further information about data collection and cleanup as well as background on the two economies, please refer to that chapter.

To obtain the returns used in regressions, I calculate returns from Datastream's Return Index datatype. This datatype takes into account payments of dividends and includes them in the returns. The Return Index figure of share k at time t $RI_{k,t}$ is defined as follows:

$$RI_{k,t} = RI_{k,t-1} * \frac{P_{k,t} + D_{k,t}}{P_{k,t-1}},$$

where

$P_{k,t}$ = price of share k at time t (or end of period t)

$P_{k,t-1}$ = price of share k at time $t-1$ (or beginning of period t)

$D_{k,t}$ = dividends paid for share k in period t

To calculate the raw return R needed on share k for period t , this transformation can then be used:

$$R_{k,t} = \frac{RI_{k,t} - RI_{k,t-1}}{RI_{k,t-1}} = \frac{RI_{k,t-1} * \frac{P_{k,t} + D_{k,t}}{P_{k,t-1}} - RI_{k,t-1}}{RI_{k,t-1}} = \frac{P_{k,t} + D_{k,t}}{P_{k,t-1}} - 1 = \frac{(P_{k,t} + D_{k,t}) - P_{k,t-1}}{P_{k,t-1}}$$

Returns are calculated monthly since this is in line with the frequency of foreign ownership figures and thus the trading strategy that can be followed. Monthly figures also

avoid most of the problems encountered with more frequent trading analysis, such as the spread between bid and ask prices and non-trading (see, e.g., Vaihekoski 2000).

Benchmark market returns are obtained from Datastream, using Datastream's value-weighted local indices. The return of market $R_{m,t}$ is the change in relevant market index from time $t-1$ to time t , where times t and $t-1$ are the last trading days of each month. Four different indices are used. Local indices are used in regressions of local data (Finland and Norway, respectively). Datastream's world market index is used as a benchmark for comparing portfolio risk against that of an assumed well-diversified portfolio of an international investor. Finally, a synthetic Nordic index is constructed to mimic a portfolio of a "diversified local investor" (i.e., an investor that invests in both exchanges studied but nowhere else). This index is used as a benchmark when all shares from Finland and Norway are pooled into the same portfolios. The synthetic index is a value-weighted average of local indices.

6.4 Analysis

To determine whether a tracking portfolio based on foreign holdings carries an extra risk premium, I use a portfolio approach. The shares are divided into four portfolios on the basis of a straightforward split of foreign ownership. The first portfolio contains share classes with foreign ownership of 0 to 25%, portfolio 2 has 25% to 50% foreign ownership, portfolio 3 has 50% to 75% foreign ownership, and portfolio 4 has shares with very high foreign ownership (i.e., 75% to 100%). The portfolios are rebalanced monthly to reflect changes in ownership. The portfolio approach also overcomes the possible issues of

time-series autocorrelation in ownership figures. Irrespective of autocorrelation, shares are placed in correct portfolios on the basis of prevailing ownership at time t .

Three sets of portfolios are used: one set where shares are from Helsinki only, one with shares from Oslo only, and one with all shares pooled. This way, portfolio performance can be compared between exchanges and country bias is reduced. Table 6.1 presents descriptive statistics for the resulting portfolios. Since most companies are still domestically owned, the number of companies is always larger in portfolios with low foreign ownership.

A couple of interesting observations can be made from this table. There is a slight indication of momentum investing already in these figures. Portfolios with higher foreign ownership seem to have had a high proportion of companies with good past performance than did portfolios with low foreign ownership. It also becomes clear that foreigners invest primarily in large companies. There is a difference between Helsinki and Oslo in how linear the relationship is, but variance is also high and the distributions are skewed. The difference is, however, not due only to a couple of large companies such as Nokia. They are always placed in portfolio number 4 and cannot affect other portfolios.

To test whether these portfolios would have produced economic benefits for investors, I calculate the returns from the portfolios and test whether excess returns exist when they are compared against three well-known pricing models: the Capital Asset Pricing Model, the Fama–French three-factor model, and a four-factor model that extends the Fama–French model with momentum. Similar tests have been previously used extensively in the academic literature to compare portfolio performance (see, e.g., Barber et al. 2001).

Table 6.1 *Descriptive statistics of constructed portfolios that track different levels of foreign ownership*

Portfolio 1 has low foreign ownership, while portfolio 4 has high foreign ownership.

Panel A: All shares from Helsinki and Oslo

Portfolio	Month avg. number of firms (min., max.)	Monthly avg. foreign ownership % (min., max.)	Monthly avg. market cap (min., max.)	Monthly avg. book-to-market ratio	Monthly avg. past year's return
1	159 (61, 199)	8 % (3%, 10%)	209 (151, 323)	1.05	21 %
2	42 (7, 59)	36 % (34%, 39%)	858 (384, 1936)	1.02	28 %
3	18 (3, 26)	60 % (55%, 65%)	1015 (225, 2263)	1.09	34 %
4	8 (1, 13)	87 % (82%, 95%)	9412 (76, 45678)	0.86	31 %

Panel B: Shares from Helsinki

Portfolio	Month avg. number of firms (min., max.)	Monthly avg. foreign ownership % (min., max.)	Monthly avg. market cap (min., max.)	Monthly avg. book-to-market ratio	Monthly avg. past year's return
1	68 (29, 103)	10 % (8%, 12%)	317 (212, 502)	1.10	18 %
2	17 (6, 26)	36 % (31%, 41%)	1008 (356, 3790)	1.02	27 %
3	7 (1, 13)	59 % (51%, 66%)	1954 (363, 5024)	0.78	37 %
4	3 (1, 7)	88 % (82%, 94%)	22262 (49, 125190)	0.31	35 %

Panel C: Shares from Oslo

Portfolio	Month avg. number of firms (min., max..)	Monthly avg. foreign ownership % (min., max.)	Monthly avg. market cap (min., max.)	Monthly avg. book-to-market ratio	Monthly avg. past year's return
1	91 (74, 117)	7 % (0%, 9%)	133 (78, 240)	1.01	23 %
2	25 (1, 37)	37 % (33%, 94%)	776 (76, 1228)	1.01	28 %
3	11 (7, 15)	61 % (57%, 68%)	411 (103, 1135)	1.17	36 %
4	5 (1, 11)	87 % (80%, 98%)	354 (46, 1791)	0.98	25 %

Value-weighted monthly returns are calculated for each portfolio and each month, taking into account possible dividend distribution. The return of portfolio p over month t is

$$R_{p,t} = \frac{1}{MV_{all}} \sum_{k=1}^n MV_{k,t-1} * R_{k,t} ,$$

where

$R_{p,t}$ = return of portfolio p from beginning of month t to end of month t

MV_{all} = sum of market values of shares in portfolio p at end of month t

$MV_{k,t-1}$ = market value of share k at beginning of month t ⁹

$R_{k,t}$ = return of share k from beginning of month t to end of month t

n = number of shares in portfolio p

CAPM

The traditional Sharpe–Lintner CAPM model is used for performing monthly time-series regressions on the market and each portfolio studied. This model allows benchmarking the foreign investor benchmark strategy to market index investing. The model specification is

$$R_{p,t} - R_{f,t} = \alpha_p + \beta_p (R_{m,t} - R_{f,t}) + \varepsilon_{p,t} .$$

Here,

⁹ Using beginning-of-month values ensures the investability of the portfolios and that no forward-looking bias is induced through the weights (Vaihekoski 2000).

- $R_{p,t}$ = return of portfolio p at time t .
- $R_{f,t}$ = return of a risk-free asset at time t . As a proxy for the risk-free asset, a one-month inter-bank interest rate is used for Finland and Norway (data on a one-month government bond, the typical proxy, is not available for these countries). If the portfolio studied contains shares from both Finland and Norway, an equally weighted average of interest rates from the two countries is used.
- $R_{m,t}$ = return of benchmark market index m at time t . Local market indices are used as benchmarks for local foreign investor portfolios. A synthetic pooled benchmark index is used when portfolios contain shares from both Finland and Norway. In addition, a world market index benchmark is used for comparison (not reported).

Fama–French three-factor model

The Fama–French three-factor model (see Fama and French 1993) extends the CAPM model by including two additional factors that represent the size effect (Banz 1981) and growth / value investment effect. These two factors have been shown to carry a risk premium not explained by simple CAPM. This model thus enables the comparison between foreign investor benchmark strategy and size investing, growth investing, and value investing. The model specification is

$$R_{p,t} - R_{f,t} = \alpha_p + \beta_p (R_{m,t} - R_{f,t}) + s_p SMB_t + h_p HML_t + \varepsilon_{p,t} ,$$

where

SMB_t = the difference between the return of the value-weighted portfolio of small stocks and of the value-weighted portfolio of large stocks for month t

HML_t = the difference between the return of the value-weighted portfolio of high book-to-market stocks and of the value-weighted portfolio of low book-to-market stocks for month t

The rest of the variables follow the definitions of the CAPM model.

For calculating SMB and HML , the method designed by Fama and French (1993) is used. The analysis is performed separately for Finnish shares, Norwegian shares, and a pooled set of both Finnish and Norwegian shares. Shares from the appropriate exchange (or pooled set) are assigned first to two groups based on market value. Group S contains shares with a market value lower than the median and group B shares with a market value larger than the median. The shares are also assigned in an independent sort into three book-to-market equity groups with breakpoints being the bottom 30 percentile (L), middle 40 percentile (M), and top 30 percentile (H). These groupings are combined into six portfolios (S/L, S/M, S/H, B/L, B/M, B/H). The allocation is done for each month, and portfolios are rebalanced. For each month, a return is calculated for each portfolio. SMB_t and HML_t are then calculated as

$$SMB_t = \frac{R_{S/L,t} + R_{S/M,t} + R_{S/H,t}}{3} - \frac{R_{B/L,t} + R_{B/M,t} + R_{B/H,t}}{3},$$

$$HML_t = \frac{R_{S/H,t} + R_{B/H,t}}{2} - \frac{R_{S/L,t} + R_{B/L,t}}{2},$$

where

$R_{X/Y,t}$ = return of portfolio X/Y for period t .

Four-factor model

The four-factor model adds the momentum effect to the Fama–French model. Current academic practice acknowledges that the Fama–French three-factor equation cannot fully capture the momentum effect reported by Jegadeesh and Titman (1993) (see, e.g., Fama and French 1996 as well as Barber et al. 2001). Momentum therefore carries an extra risk premium that may correlate with the foreign investor benchmark portfolios.

The model specification is

$$R_{p,t} - R_{f,t} = \alpha_p + \beta_p (R_{m,t} - R_{f,t}) + s_p SMB_t + h_p HML_t + m_p PMOM_t + \varepsilon_{p,t},$$

where

$PMOM_t$ = the equally weighted month t average return of share classes with the highest 30 percent return in the past year up to month t , minus the equally weighted month t average return of the share classes with the lowest 30 percent return in the past year up to month t . As a check, value-weighted $PMOM_t$ values are calculated also and compared to equal-weighted return figures.

The rest of the variables follow the definitions of the CAPM model.

6.5 Results

Monthly time-series regressions are run for each of the models described, on each portfolio formed. In total, 12 portfolios are tested, four for each of the markets and four pooled portfolios. Additionally, to test the quality of the regressions, a fifth portfolio is formed, in which all shares from the market are included. This portfolio should mimic the market as a whole and give an indication of the accuracy of the benchmark indices. The return from the benchmark index and portfolio of all shares is never exactly the same, though. Standard market indices may include only some shares and rebalance the index differently. The R^2 from the portfolio of all shares should, however, be very high, since the direction of returns should be the same as that of the returns of the benchmark index, even though there may be fluctuations in the magnitude.

Table 6.2 shows the intercepts from the three models: CAPM, the Fama–French three-factor model, and the four-factor model. The first two result columns in Table 6.2 show the raw and market-adjusted monthly mean returns for each portfolio. As can be seen, the portfolios with high foreign ownership have done better, on average, than the low-foreign-ownership portfolios. This is consistent with the index calculations of Figure 6.1 and Figure 6.2.

The market-adjusted-return column also shows that a portfolio containing all shares in the database (“the market”) performed almost equally with the benchmark index, as would be expected from the intercept of the CAPM model. This implies that the chosen benchmark index, supplied by the exchange, is very well in line with the database under investigation.

Table 6.2 *Raw returns of constructed portfolios that track different levels of foreign ownership, intercepts from the CAPM, Fama–French, and four-factor models*

Panel A: All			Intercept from		
Portfolio	Mean raw return	Mean market-adjusted return	CAPM	Fama–French	Four-factor
1	0.010	-0.008	0.000 -0.09	0.011 2.48*	-0.009 -1.33
2	0.003	-0.014	-0.011 -2.05*	-0.001 -0.16	-0.015 -1.32
3	0.022	0.005	0.009 1.25	0.024 3.16**	0.017 1.42
4	0.037	0.020	0.016 2.05*	-0.005 -0.05	0.023 1.51
All	0.018	0.001	0.000 0.46	0.000 0.16	0.000 0.00

Panel B: HEX			Intercept from		
Portfolio	Mean raw return	Mean market-adjusted return	CAPM	Fama–French	Four-factor
1	0.012	-0.010	0.002 0.31	0.012 2.44*	-0.003 -0.43
2	-0.001	-0.022	-0.020 -2.67**	-0.009 -1.09	-0.022 -1.37
3	0.026	0.005	0.014 1.46	0.014 1.41	0.010 0.74
4	0.037	0.017	0.014 1.73+	0.011 1.02	0.023 1.69+
All	0.023	0.002	0.003 1.12	0.004 1.62	0.005 1.25

Panel C: OSE			Intercept from		
Portfolio	Mean raw return	Mean market-adjusted return	CAPM	Fama–French	Four-factor
1	0.008	0.001	0.002 0.50	0.000 0.14	0.002 0.32
2	0.014	0.007	0.007 1.51	0.009 1.22	0.016 1.32
3	0.018	0.010	0.009 1.45	0.003 0.31	-0.001 -0.08
4	0.005	-0.002	-0.001 -0.25	-0.001 -0.20	-0.007 -0.73
All	0.009	0.002	0.002 1.09	-0.000 -0.15	0.000 0.05

*** $p < .001$, ** $p < .01$, * $p < .05$, + $p < .10$ hypothesized paths: one-tailed tests, controls two-tailed, unstandardized coefficients; robust standard errors are reported

Intercepts have a very small value and are insignificant, implying that the factors in the model explain the return premia well. The more factors in the model, the better the model fits the data, as is common in most multiple regression models. When more variables are added, the significance levels of the intercepts decrease across the board. The implication is quite clear; investing by benchmarking the aggregate foreign ownership figures could produce good returns, but there is no extra premium in foreign ownership. The same could be achieved by mimicking other known trading strategies.

What kind of strategy would be mimicked then? Table 6.3 shows this. It lists the coefficients from four-factor-model regressions. Intercepts are insignificant, and R^2 values show relatively good model fit.

Comparison of portfolios 1 and 4, the two opposite portfolios in terms of foreign ownership, reveals the differences in investment strategies. The high-foreign-ownership portfolio would have an overweight of large caps (negative SMB coefficient), an overweight of growth stocks (negative HML coefficient), and an overweight of companies that have performed poorly in the past (negative PMOM coefficient). The low-foreign-ownership portfolio would be exactly the opposite; it would overweight small caps, value stocks, and companies with good past performance.

Table 6.3 *Coefficient values for all constructed portfolios that track different levels of foreign ownership from four-factor model analysis*

Panel A: All shares from Helsinki and Oslo						
Portfolio	Coefficient estimates for four-factor model					R ²
	Rm-Rf	SMB	HML	PMOM	Intercept	
1	0.773	0.568	0.306	0.289	-0.009	67.3%
	11.40***	6.12***	4.00***	4.15***	-1.33	
2	1.052	0.548	0.194	0.199	-0.015	65.3%
	9.20***	3.88***	2.03*	1.70*	-1.32	
3	1.021	0.214	0.631	0.110	0.017	45.6%
	8.58***	1.03	5.07***	0.81	1.42	
4	0.767	-0.412	-0.712	-0.346	0.023	74.5%
	6.92***	-2.55*	-6.85***	-2.52*	1.51	
All	0.949	0.080	-0.094	0.005	0.000	94.8%
	25.63***	1.56	-2.10*	0.11	0.00	

Panel B: Shares from Helsinki only						
Portfolio	Coefficient estimates for four-factor model					R ²
	Rm-Rf	SMB	HML	PMOM	Intercept	
1	0.617	0.484	0.253	0.220	-0.003	54.1%
	6.05***	3.74***	2.15*	2.53*	-0.43	
2	1.110	0.545	0.220	0.195	-0.022	59.6%
	6.43***	2.57*	1.42	0.97	-1.37	
3	0.655	-0.179	0.331	0.050	0.010	28.6%
	3.83***	-0.63	1.66+	0.26	0.74	
4	1.006	-0.016	-0.351	-0.177	0.023	75.4%
	6.42***	-0.06	-2.07*	-1.48	1.69+	
All	0.938	0.106	-0.073	0.016	0.005	94.8%
	23.75***	1.90+	-1.75+	-0.38	1.25	

Panel C: Shares from Oslo only						
Portfolio	Coefficient estimates for four-factor model					R ²
	Rm-Rf	SMB	HML	PMOM	Intercept	
1	0.871	0.224	-0.158	-0.019	0.001	75.7%
	14.86***	2.00*	-2.55*	-0.35	0.32	
2	0.887	-0.014	-0.031	-0.116	0.016	58.1%
	8.73***	-0.15	-0.51	-1.23	1.32	
3	1.378	0.069	-0.184	0.059	-0.001	62.8%
	8.37***	0.34	-0.89	-0.45	-0.08	
4	0.832	0.369	-0.096	0.097	-0.007	42.9%
	7.33***	2.15*	-0.67	0.90	-0.73	
All	0.972	0.035	-0.104	-0.009	0.000	89.4%
	25.53***	0.61	-2.02*	-0.21	0.05	

*** p < .001, ** p < .01, * p < .05, + p < .10 hypothesized paths: one-tailed tests, controls two-tailed, unstandardized coefficients; robust standard errors are reported

It is somewhat surprising to find that the sign of *PMOM* is negative for foreign investor portfolios if in general foreigners are momentum investors. Following a tracking strategy would, therefore, lead to the investor not using momentum as a strategy but actually end up following a contrarian strategy. Some explanations can be offered. First, size selection is very strong among foreigners in all markets. Foreign mutual funds invest almost solely in large companies in each market. Aggregate ownership figures may change so slowly in such investments that the aggregate ownership simply does not track share performance at a month-on-month level. Secondly, as was found by Grinblatt, Titman, and Wermers (1996) and discussed previously, momentum strategies are not used when the markets perform badly. As the data also contains some time of market downturn, this may affect the regressions.

6.6 Summary

Aggregate foreign ownership numbers are not actual trading figures. Therefore, one cannot tell from them how individual investors perform or whether an average foreign investor has had a better performance than an average domestic investor. What they do tell is that, as a group, foreigners have held those shares with highest value appreciation in Finland but not in Norway. Therefore, it is likely that in Finland the performance of an average foreign investor has been superior to that of an average domestic investor.

One could assume that professional fund managers who should perform well manage foreign portfolios and that following them has an economic value. But the results show that if an individual investor tries to use only public aggregate data for stock picking and portfolio construction there could be added return, depending on the starting point, but no

extra reward is given for following the foreigners. A portfolio constructed with aggregate foreign ownership statistics does not have a risk premium that cannot be explained by well-known risk factors.

Judging whether an investment strategy is profitable or not is always highly dependent on the benchmark. It seems foreigners did extremely well from the Finnish market in the '90s. It is easy to conclude from the Finnish data only that foreigners beat the market. The data from Norway tells a different story. There, the performance has been quite equal to that of domestic investors or even a bit worse. Further, if one assumes that CAPM or the Fama–French three-factor model explains all normal variation in stock returns, in Helsinki an investor would have earned abnormal returns by following the aggregate foreign ownership statistics for a decade in the 1990s. A strategy where investors buy those shares with high foreign ownership and short those with low foreign ownership would have beaten the market. However, a more detailed look at the strategy reveals that adding the momentum effect would have tracked that strategy with high accuracy.

One has to bear in mind also that the relevant benchmark depends on the risk profile of each individual investor. Compared to domestic investors, foreign professionals typically have much more diversified portfolios and can take larger risks in individual markets. Karhunen and Keloharju (2001) report that Finnish retail investors typically own shares in only one or two companies. The level of diversification (in terms of both international and industrial diversification) is very poor. This does provide an interesting application for the foreign holding figures. For a private investor with little time or resources to track the investment strategies outlined above, foreign holding numbers provide an easy-to-use proxy. By simply constructing a portfolio according to the weights of foreign holdings,

one could create a portfolio not only resulting in better diversification but also combining modern investment styles. While no extra premium is gained, it does offer an inexpensive alternative for an investor without the ability to construct style portfolios independently.

The data set used in this study covers pretty much the whole history of trading when foreign investment was allowed to occur freely in the two countries under study. However, determining the superiority of one trading strategy or investment style over another typically takes decades of data. Further, making final conclusions about the profitability of a strategy would need a more detailed benchmark of the risk profile of the investors. When domestic investors are analyzed as one large group, it is not possible to capture the individual risk preferences of various investor types. Unfortunately, such a data set is not available yet. This study therefore leaves open interesting further directions of future research. It would be an interesting topic of further study to see how the conclusions change once the countries with accurate tracking of foreign holdings have undergone a couple more boom–bust cycles and how this has affected individual investor groups.

7 SUMMARY AND CONCLUSIONS

This dissertation has examined foreign ownership of firms on the European financial market from four viewpoints: those of foreign investors, domestic investors, companies, and stock exchanges. The work offers the academic community fresh data on the relatively little studied topic of foreign ownership. It also approaches anomalies such as home bias from new directions, such as the view of companies as active agents who demonstrate home bias on the part of their owners and stock exchanges that must tailor their business models to cope with the behavior and preferences of investors.

7.1 Contribution to Academic Study

Home bias of investors has been a topic under academic scrutiny for some thirty years now. The studied foreign ownership data offers several new insights to this phenomenon, as summarized below.

This dissertation shows that the home bias anomaly can be extended from investors to companies in listing situations. It seems that the home bias of the main owners is an independent phenomenon that cannot be explained by other factors and should probably be considered in relevant studies of public offerings. As is discussed in Chapter 4, only 5.8% of all public offerings by European companies have been made on foreign exchanges. And when a foreign IPO does occur, the target market is the home country of the largest owners. A company that operates fully in Italy but is owned by a family in Sweden will very likely be listed in Sweden. This logic applies not only to the original founders or families of the founders but also to financial investors. A German company

that has received a large amount of venture capital from a Dutch venture capitalist is likely to list in the Netherlands. Intuitively, an issuer should perform its public offering in a market where it is easiest to market to the public. Domestic markets typically maximize marketability and this probably explains why foreign issues are made so seldom. To maximize issue price a target market that knows the company well should be chosen so that marketing the issue is as easy and efficient as possible. But the correlation found in this dissertation between ownership and target market when a foreign IPO cannot plausibly be explained with marketability.

Due to home bias, the benefits of cross-listings previously found in academic studies depend on company size. Previous research indicates that a cross-listing can be used to reduce the cost of capital. A cross-listing should lower the cost of capital if the investor base broadens and the resulting investor community as a whole has less exposure to country specific risks and market fluctuations. However, the results in Chapter 3 show that there is a strong size effect when it comes to what kind of companies can attract foreign owners. This size preference absorbs cross-listing. Investors show distinct preferences for certain types of assets, even if the firms are cross-listed. This would indicate that the cross-listing of a small or medium-sized company would have a limited effect on said company's ownership base and consequently its cost of capital.

Because home bias "protects" existing national entities, network effects and cost savings alone will not lead into stock exchange consolidation. Researchers of stock exchanges easily predict the demise of national exchanges due to economies of scale that can be exploited by large entities. Several studies show that an integrated, large market lowers both trading costs to investors and cost of capital to companies and is more likely to attract

admissions (see, e.g., Stulz 1999, Malkamäki 1999, Martin and Rey 2000, and Pagano et al. 2000). Further, there is a strong network effect in trading. Trading attracts trading, liquidity brings in more liquidity, and large investor masses pull in new listings. Models indicate that such fundamental differences between large and small exchanges should inevitably lead to consolidation. These models do not however take into account home bias. As is seen from the EASDAQ case study, it is very difficult to create a challenger for a national exchange from scratch. Sourcing admissions is a major hurdle for a new challenger. Home bias keeps investor focus on national markets, which means that the only route to a smaller number of exchanges is through mergers. This is a game where existing players can protect their positions and resist such development, even if economies of scale could be created. This is why market consolidation has been very slow in Europe and characterized by nationalistic concerns, such as the location of the headquarters of the exchange.

The findings demonstrate that while listing location does have a significant impact on liquidity, most of the liquidity of a share is still dependent on company-specific factors.

The impact of economies of scale in trading may not be as straightforward as some of the previous research indicates. Puttonen (2004) takes an example from the trading of Nokia. Though Nokia is listed in Paris, New York, and Frankfurt, over 70% of its trading occurs in Helsinki. If economies of scale were the main reason for stock exchange consolidation, trade in Nokia should have become concentrated in New York, or London, a long time ago. As an exchange, Helsinki is a small and quite illiquid marketplace. Puttonen offers a straightforward explanation: the gravity effect. Nokia has historically been traded in Helsinki, and investors find the share easily in this marketplace. Even though the operating

costs of the exchange may not be the lowest, the cost of finding trade is low and high liquidity offers narrow spreads. What seems to be important is that the *trading process* of a particular share has economies of scale, even if the *exchange* itself may not have them. When one analyses the economies of scale of an exchange, it is not sufficient to analyze the costs of trading, such as cost of trading systems and back-office administration. One must consider also the costs of finding the market and parties to trade with. Such economies of scale can develop for any exchange, not necessarily just the large ones.

7.2 Practical Implications

Many practitioners believe that if the financial market within the European Union were to work with efficiency equal to that of its North American counterparts, share trading would take place on European counterparts of NASDAQ and NYSE where traders would finance “European” companies instead of companies from individual European markets. In such a unified market, there would be little or no home bias when it comes to investing in European shares. Investors would hold portfolios that are well diversified geographically across the continent. Publicly traded corporations would see their ownership being spread between investors from their country of origin and investors from across Europe, the latter typically being the majority. Currently, this is true in only some of the largest blue chip companies.

The results of this dissertation indicate that arriving in a common European financial market requires that some of the traditionally stiff ownership structures eventually be broken. Foreign investors’ preference for size and their requirement of liquidity come head to head with European ownership culture and language barriers that run deep into the

structures of corporations. The issue involves more than just a split between domestic and foreign; it is a question of ownership between a small group of insiders and the rest as outsiders. With the exception of firms in the U. K. and Ireland, most companies in Europe are closely held, mainly by families (Faccio and Lang 2002). European families like to keep their stakes in companies, and if the companies are listed, they are listed domestically. Such firms with a concentrated ownership are hardly at the top of the priority list for foreign investors.

Pre-IPO ownership structure has an impact on where and how companies are listed and how ownership is spread between investors later on. While political action typically focuses on the public markets and their regulation, the results of the dissertation highlight the importance of the private market. The financing structures of pre-IPO companies have the potential to break away from home bias and facilitate cross-border trade. As financial investors, venture capitalists are less tied to cultural barriers when they seek investment targets. Israel is a case in point, showing that it is possible not only to attract foreign early-stage financing but also to circumvent the problems of a small national stock exchange. Support for cross-border venture capital and encouragement of foreign listings should, therefore, be among the tools for enhancing market integration.

Local exchanges remain a key financing vehicle not only for public companies but also for non-listed companies, due to the exit market that is created. The data in this dissertation shows how seldom foreign listing decisions are made and how hard it is to create pan-European trading locations. It is unlikely that a pan-European exchange along the lines of EASDAQ could be successfully created soon. Due to the size preference by foreign investors, new issues will primarily have to tap into the national financial markets.

Accordingly, venture capitalists and other financing parties must rely on national exchanges for the foreseeable future. While cross-border trade is encouraged and larger entities may appear through mergers, it is equally important to make sure that local exchanges remain strong and vital trading places during the transition.

With foreign ownership comes the risk of exploitation. All open markets must face the risk of foreign investors buying assets from inefficient national markets at a discount or performing hostile takeovers. Such exploitation is a sign of inefficiency resulting from domestic owners not actively managing their assets. Ensuring that companies trade at a fair price is a question of making sure there are active domestic owners who operate in an active local market for the assets. So, in addition to allowing cross-border capital flows, a strong domestic investment culture is necessary. As discussed in Chapter 6, typical private domestic investors still invest inefficiently and do not diversify their portfolios sufficiently. There exists a huge potential in the investments of private persons in each country that is guided by the overall investment culture. As the investment culture advances and investment skills improve, an increasing amount of domestic capital will also be invested into foreign targets. This is for the benefit of both the domestic market and the larger integrated financial market.

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