

The Stock Price Reaction to Cross-Listings on Various Markets: Case of European Companies

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Abstract

The paper compares the stock price reaction to a foreign listing in the US, in the UK and in continental Europe by European companies. The market reaction to a foreign listing is lesser in the magnitude than reported earlier and is related to time-specific, listing-specific, such as listing order and prior OTC listing, and company-level factors, such as size and industry. US listings are negatively affected by the Sarbanes-Oxley Act, while UK listings yield significant excess returns in recent years driven by returns of small companies around AIM listings. There is no evidence of the impact of the Euro introduction on cross-listings within Eurozone. Lastly, there is a valuation premium for cross-listings that took place during the technology bubble in the late 1990s. The evidence supports *Market timing* and *Business strategy hypotheses* and stresses the importance of the listing and compliance costs involved for the market reaction to foreign listing on the market with stricter regulations.

Keywords: cross-listing, stock price reaction, Sarbanes-Oxley Act, AIM, Euro

JEL Classification codes: G14, G32, G38

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1. Introduction

The majority of the literature on the valuation impact of foreign listings focuses on the experience of foreign companies listing on the US stock exchanges while there is limited empirical evidence on how a listing by a foreign company on the London Stock Exchange and other European exchanges affects the company's stock price. At the same time, statistics shows that the number of foreign companies listed on the major European exchanges has been significant, even compared to the number of foreign companies listed on the major US exchanges, and it continues to rise (*Table I*). Furthermore, there is evidence that attractiveness of different foreign capital markets for listing has been shifting in recent years. Thus, *Zingales (2007)* suggests that US capital market is losing its competitiveness as a result of an improvement of European equity markets and of an increase in the listing costs in the US. The aim of this research is to reflect on the growing importance of European markets and to examine the stock price reaction to international listings on in the US, in the UK and in continental Europe. Further, the focus of the study is on the experience of European companies - the motivation here is to see whether rapidly changing European markets satisfy the capital and liquidity needs of European companies or they are still better off listing in the US.

The study employs a rich hand-collected dataset of almost 500 cross-listing events by European companies that take place during the period of time from June 1975 to December 2007 on US stock exchanges, UK stock exchange and other European exchanges. These three groups of host markets vary significantly by market size, liquidity, the level of investor protection, information environment, etc.; and the comparison of the stock price reaction to a listing on these host markets provides an opportunity for testing various theories on the valuation impact of international cross-listing. In line with theoretical predictions, I find that a cross-listing, on average, is a value-enhancing corporate event (around 2% excess returns) with the stock price adjustment taking place mostly around the announcement of cross-listing and not around the listing date. The valuation impact is particularly strong when the cross-listing is the company's first foreign listing. Analysis reveals that the US cross-listing announcement, on average, does have the highest valuation impact (3.3%) compared to the UK (2.7%) and other European (0%) listing announcements. Furthermore, the study examines time-specific factors, i.e. capital markets developments that take place in recent years: the Sarbanes-Oxley Act in the US, introduction of AIM in the UK and the Euro in Europe and, lastly, the technology bubble in the late 1990s, listing-specific factors, such as listing order, prior OTC listing and capital raising activity, and company-level factors, such as size, growth opportunities and industry, as

potential determinants of the market reaction to the foreign listing in the US, in the UK and within continental Europe.

While most of the existing empirical evidence is based on cross-listing events that take place in the 1990s (*Miller (1999), Serra (1999), Doidge et al (2004)*) there have been significant changes in equity listing and trading environment that triggered discussions on the benefits and costs of a foreign listing. Thus, most recently *Dobbs and Goedhart (2008)* argue that shares cross-listing does not create value. Meanwhile, despite increasing over years globalization and integration of financial markets and changes in the listing environment that potentially reduce the benefits of a cross-listing (changes in the regulations, development of electronic trading, etc), the number of companies that list on a foreign exchange remains considerable: on average 14% of the total number of listed companies on the major US exchanges and on average 19% of the total number of listed companies on the LSE and other major European exchanges (*Table I*). Moreover, according to the *BNY's The Depository Receipts Markets Review 2007*, the number of sponsored DRs programs in 2007 reached its historical high of 2,060 programs from 76 countries providing the total DRs trading of nearly \$3.3 trillion in 2007. Clearly, cross-listing is still an important aspect of financial markets and this fact is calling for investigation on how capital market developments in recent years affect the benefits and costs of the international cross-listing.

I argue that the following developments have had a significant impact on the listing environment and, accordingly, on the stock price reaction to the international cross-listing: firstly, the vital changes in regulatory listing environment in the form of the Sarbanes-Oxley Act (SOX) of 2002 in the US that imposes even stricter compliances and disclosure requirements for US-listed companies, secondly, the introduction and boom of alternative markets such as AIM of the London Stock Exchange whose main feature is light listing requirements as compared to those of the Main Market, and thirdly, the introduction of a single European currency Euro that increases integration of European financial markets and facilitates cross-border transactions. Listings before and after the adoption of SOX as well as listings on AIM vs on the Main Market of the London stock exchange are subject to different levels of regulations. In theory, stricter regulation improves investor protection and confidence, which potentially finds its reflection in stock prices. This argument, however, does not take into account compliance costs involved. There is recent empirical evidence suggesting that higher-level regulation is not necessarily valued by investors. *Zhang (2007)* and *Litvak (2007)* report significant negative abnormal returns around events leading to the passage of SOX and around announcements indicating that the Act will apply to cross-listed foreign companies. *Jenkinson and Ramadorai (2007)* document

significant positive long-term excess stock returns of UK companies that switch their listing from the Main Market of the LSE to AIM. Also, *Zingales (2005)* puts forward the argument regarding the importance of the regulation for cross-listing benefits vs. costs, particularly after SOX adoption. To contribute to this discussion, I compare the market reaction to the US listing by European companies before and after the adoption of SOX and the market reaction to listings on AIM and on the Main Markets of the LSE in the UK. I find evidence that the Sarbanes-Oxley Act reduces the valuation benefits of the US listing. At the same time, the positive valuation impact of listing in the UK in recent years is driven by the significant excess returns around AIM listings while excess returns around Main Market listings are insignificant. These results suggest that increased disclosure and consequently better investor protection is not compensated by a higher stock valuation or, in other words, a higher-level of regulation of listed companies is not valued by investors which is in line with the findings of *Jenkinson and Ramadorai (2007)* who suggest that some investor groups who do not value higher regulatory standards become the dominant investors when companies list on AIM. I argue that the negative market reaction to listing on market with stricter regulations might indicate that investors evaluate the benefits of improved information and legal environment in conjunction with the costs involved. Further, I find another empirical support for the argument that the market reaction is based on cost-benefit analysis: I find that the up-grade from an OTC listing to a US stock exchange listing, which entails an increase in the level of disclosure requirements as well as a considerable increase in the listing and compliance costs, does not yield any significant excess returns.

The next time-specific factor that I examine is the introduction of the Euro, a single European currency that changes the listing environment and potentially affects benefits from cross-listing within Europe. I find no evidence that the Euro introduction has any impact on the market reaction to listings within Eurozone by European companies. Furthermore, much of the empirical evidence on the valuation effect of international cross-listing is based on data from the 1990s - the time when stock valuations were unusually high. To address this concern, I examine the additional impact of the cross-listing in the late 1990s and find that during the bullish period of the technology bubble in the late 1990s investors paid a particularly high premium for foreign shares, which is economically and statistically significant even after controlling for industry affiliation and for other factors.

Lastly, I find that company-level characteristics, such as size and industry, are the important determinants of excess returns around foreign listing, specifically, investors pay a significant premium for smaller foreign companies and for foreign companies working natural resources. These findings are complementary to the findings of *Pagano et al. (2001, 2002)* who suggest that company size and industry are the distinctive characteristics of cross-listed companies.

I use event-study methodology with some modification in order to evaluate the excess returns around the international cross-listing. The main event is the announcement of a foreign listing; and the market reaction is measured by the cumulative market-adjusted stock returns on the home market during (-10, 10) days event window around the announcement of the listing on a foreign exchange. As a robustness test, I also evaluate the monthly risk-adjusted home market returns during (-2, 0) months event window around the cross-listing using Jensen's alpha approach with 3-factor benchmark model. This robustness test allows using larger sample of cross-listing events (the sample of the announcement events is smaller due to the unavailability of some announcement dates) and allows adjusting the excess returns for additional risk factors such as *Fama and French (1996)* factors. Further, the determinants of the market reaction to the cross-listing are evaluated with multivariate regressions.

This research is related to several recent papers - *Sarkissian and Shill (2008)* and *Roosenboom and Van Dijk (2007 WP)*, that examine the valuation effects of foreign listing on multiple destination markets. *Sarkissian and Shill (2008)* test whether there are permanent valuation effects from a cross-listing by examining long run stock returns around foreign listings that take place in 25 host countries; however, they do not compare the excess returns around foreign listing on individual host markets or by host market groups. The recent working paper by *Roosenboom and Van Dijk (2007 WP)* does compare abnormal returns around the announcement of the cross-listing on multiple exchanges, however, in contrast to this study, it focuses on country and firm characteristics as the determinants of the abnormal returns. Neither *Sarkissian and Shill (2008)* nor *Roosenboom and Van Dijk (2007 WP)* include in their analysis time-specific factors as the determinants of the excess returns around foreign listings. Another recent working paper by *Sarkissian and Shill (2008WP)* investigates how relative market conditions affect the long run cross-listing benefits but its focus is on relative valuation of cross-listed companies rather than on the stock price reaction to the cross-listing depending on the market conditions.

This research departs from earlier studies in the following ways. Firstly, it employs a rich dataset of cross-listing events by European companies hand-collected from multiple data sources. Secondly, the study provides an empirical evidence on the differences in the market reaction to foreign listings across multiple host markets (the US, the UK and continental Europe) and over different periods of time (before 2000s and during the 2000s). Thirdly, the study examines the time-specific determinants of the stock price reaction to the cross-listing, i.e. how significant capital markets developments in recent years has affected the value of the cross-listing on different host markets: this study offers an empirical insight on the value of the US listing for European companies after the introduction of Sarbanes-Oxley Act; on the value of the UK listing after the introduction of AIM; and on the value of the Eurozone listing after introduction of the Euro. Fourthly, the study detaches the valuation impact of foreign listings that take place during the up-market period of the technology bubble in the late 1990s. And lastly, it contributes to the evidence on how company-level characteristics affect the price reaction around the cross-listing.

2.1 Literature survey: Theoretical Background

Academic literature offers a number of theories in attempt to explain the valuation impact of international cross-listing. Capital markets segmentation hypothesis (*Stulz (1981), Errunza and Miller (2000)*) states that net benefits from cross-listing stem from a lower cost of capital as the cross-listing company makes its shares more accessible to non-resident investors who would otherwise find it less advantageous to hold the shares because of the segmentation of the markets by investment barriers.

Investor recognition hypothesis (*Merton (1987)*) takes into account such market friction as information flow barriers. By listing shares on a foreign exchange, companies expand the investor base (*Foerster and Karolyi (1999)*), increase investor awareness abroad, make information about the company more easily accessible by foreign investors, and, consequently, significantly reduce investors' monitoring costs.

Signalling hypothesis (*Fuerst (1998)*) predicts that by listing on an exchange with high disclosure requirements, profitable companies convey to the market the information about their future prospects and their high quality. The market reaction to the cross-listing decision is predicted to be strongly positive when the cross-listing takes place on an exchange with strict disclosure requirements as it signals future abnormal operating performance of the company.

Legal bonding hypothesis (*Stulz (1999), Coffee (1999, 2002), Doidge et al. (2004)*) states that cross-listing on an exchange with higher legal and disclosure standards 'bonds' the company to better corporate governance practices that limit the ability of managers and controlling shareholders to take excessive private benefits. Thus, the impact on the cost of capital of cross-listed companies might come from the new legal environment that provides better protection to the minority shareholders. However, *Siegel (2005)* provides evidence that the Securities and Exchange Commission does not effectively enforce the law against cross-listed foreign companies and distinguishes between Legal bonding and Reputational bonding of cross-listing arguing that Reputational bonding (bonding by building the company's reputation) explains benefits from cross-listing better than Legal bonding.

Proximity preference hypothesis is suggested by *Sarkissian and Schill (2004, 2008)*. They show that geographical, economical, cultural, and industrial proximity are the important determinants of the corporate decision to cross-list and that the valuation benefits are higher for cross-listings on the markets that are already familiar with their home market's products and that are relatively close geographically.

According to Market timing hypothesis corporate finance managers time the company's listing on a foreign exchange to take advantage of high stock valuation. The timing might refer to company-level performance (listing following the strong stock performance) or to market-level performance (listing during 'hot' market). Consistent with the company-level Timing hypothesis, *King and Segal (2006)* and *Gozzi et al. (2008)* report that relative company valuation measured by Tobin's q peaks around cross-listing and reduces significantly in the following years. *Sarkissian and Shill (2008 WP)* provide evidence in favour of Market-level timing hypothesis that companies tend to cross-list in relatively 'hot' host markets, i.e. when the host market outperforms other markets economically (in terms of GDP growth) and financially (in terms of growth in market capitalization-to- GDP ratio).

Business strategy hypothesis predicts the valuation impact of cross-listing to be a function of company- specific factors because companies make the decision to cross-list for reasons related to their global strategy. *Pagano et al. (2002)* suggest that cross-listing can potentially strengthen a company's competitive position in its industry. Surveys of corporate finance managers on the benefits of cross-listing (*Fanto and Karmel (1997)* and *Bancel and Mittoo (2001)*) reveal that industry-specific reasons and a company's global business strategy are among the main reasons to cross-list. *Bancel et al. (2006)* provide empirical evidence that emphasises the importance of the Business strategy hypothesis in explaining long-term performance of cross-listed companies.

2.2 Literature survey: Empirical evidence¹

The empirical evidence on the valuation effects of international cross-listing is mixed. The vast majority of the literature focuses on cross-listings in the US by non-US companies. US exchanges offer the listing companies a number of benefits including high liquidity, large investor base, analyst and media coverage, access to capital, and a high level of investor protection. Not surprisingly, the empirical evidence shows that in the 1980s and the 1990s foreign companies listing in the US, on average, experienced significant positive abnormal returns. Thus, *Foerster and Karolyi (1999)* reports cumulative abnormal returns of more than 20% during the year before listing and during the listing week. *Miller (1999)* reports positive abnormal return of 1.15% on the announcement of ADR-issuance. The abnormal return is higher for companies from emerging markets (1.54%) and significantly higher for exchange listings (2.63%) compared to OTC listings and private placements. More recent paper by *Bris et al (2007)* uses a relatively small sample of 20 non-US companies with dual-class shares cross-listed in the US and reports positive and statistically significant annualized average daily abnormal return of 1.32% for the domestic share class and 0.62% for the US-listed share class during the 50 days period prior to the cross-listing event.

A number of studies examine returns of Canadian companies listing in the US. Canadian companies list on the US exchanges directly as opposed to other foreign companies that issue ADRs in order to list in the US. Further, the Canadian and US markets have been geographically, economically and culturally integrated for a long time. Despite the perceptible market integration, studies by *Doukas and Switzer (2000)* and *Mittoo (2003)* investigate direct listings in the US by Canadian companies and report that Canadian companies experience significant positive price effects from cross-listing in the US. They conclude that the Canadian and the US markets are still segmented.

Very few studies look at cross-listings on the exchanges outside of the US. *Serra (1999)* is one of the first to compare the stock price impact of cross-listing in the US and in the UK. The study reports that for companies from emerging markets listing in the UK has the same valuation effects as listing in the US. However, for companies from mature markets, the stock price impact is limited to NYSE listings. *Sarkissian and Schill (2008)* examine monthly stock returns around more than 1500 listings placed in 25 host countries. They find evidence that the permanent decrease in the cost of capital of about 2% is predominantly explained by cross-product market trade and investor familiarity. The study suggests that the US market does not offer unique cross-listing benefits. *Roosenboom and van Dijk (2007 WP)* compare the stock price reaction to cross-listing on eight major US and non-US exchanges controlling for country-specific and firm-level characteristics. They report that abnormal returns around the day of cross-listing announcement is the highest for US listings, followed by UK and then by European listings while it is insignificant for Tokyo listings. Further, they report the determinants of stock price reaction to cross-listing in the US are market-level liquidity, information disclosure and the level of investor protection while those for cross-listing in the UK are transparency and investor protection. However, this study has not detected any significant determinants of stock price reaction to cross-listing in Europe and in Japan and invites further theoretical and empirical work on this issue.

3. Testable Propositions

3.1 Valuation impact of cross-listing on Different Host Exchanges

Most of theoretical arguments on the valuation effects of international cross-listings predict that a company will experience an increase in the valuation after listing on a 'higher quality' market. Market quality can be described by the level of capital market development, investor base size, liquidity, investor protection, information environment, etc.. The markets of the US, UK and continental Europe differ from each other by the market qualities named above and these differences potentially cause different stock price reaction to cross-listing on these markets.

The US and the UK are English-law countries that focus on resolution of information asymmetry and have market-oriented financial systems (*Guenther and Young (2000)*). In contrast, the countries of continental Europe are civil-law countries with bank-oriented financial system and tax accounting rules. Furthermore, *Doidge et al. (2004)* argue that the US market provides extremely good investor protection, great liquidity, and the highest disclosure standards compared to the rest of the world. *Coffee (2002)* specifies that companies cross-listed in the US are committed to respect minority investor rights and increase disclosure as they subject themselves to increased enforcement by the Securities and Exchange Commission, to more demanding litigation environment and to reconciliation of financial statements in accordance with US GAAP. At the same time, according to *Baker et al. (2002)*, to list in London a foreign company must comply only with LSE rules that are less strict than those of NYSE. While the US and the UK markets require higher disclosure and ‘bond’ companies to better corporate governance (*Coffee (2002)*), exchanges of continental Europe are not known to do so. *Saudagaran and Biddle (1995)* report results of the survey on the disclosure levels for nine major stock exchanges according to which the US has the highest disclosure level, followed by the UK, while other European exchanges are at the bottom of the list. *Coffee (1999)* argues that European laws do not even remotely parallel the US securities laws regarding the attempt to reduce agency costs and improve minority shareholders protection. It is important to notice that investor protection regulation in Europe is subject to significant change after the Market in Financial Instruments Directive of 2004 (whose ultimate aim is investor protection (*Moloney (2007)*)) becomes effective. However, the full implementation of the MiFID is scheduled for November 2007, and the sample of European cross-listing events in this study after Nov 2007 is insufficient to evaluate impact of the MiFID on the market reaction to cross-listing in Europe.

The interesting and important factor influencing cross-border listings within the European Union is the mutual recognition principle incorporated in the European laws regarding cross-listings (*Coffee (1999)*). The mutual recognition principle, enforced by EU’s Financial Services Action Plan of 1999, states: “what is sufficient for a company to list in one member country should be sufficient in any other member country” (*Wojcik et al. (2005)*). Consequently, European countries do not need to meet any additional legal and disclosure requirements to cross-list within Europe.

Furthermore, cross-listing in the US results in the increased attention of analysts. *Lang et al. (2003)* and *Bailey et al. (2005)* report significant increase in analyst coverage following cross-listing in the US. As to the UK market, *Baker et al. (2002)* report that companies that cross-list in London experience growth in visibility as well, but the increase in the level of analyst and press attention is

significantly less compared to cross-listing on the NYSE. Consequently, based on the *Investor recognition hypothesis* argument, more significant improvement of information environment would lead to higher valuation impact. On the other hand, according to *Proximity preference hypothesis*, economical, cultural, geographical and industrial similarity between home and host markets, which is particularly relevant for European countries, is appreciated by investors and might result in higher benefits from cross-listing. Therefore, based on the theoretical arguments, the valuation impact of international cross-listing is expected to vary depending on host market.

Overall, there is conclusive evidence that the US offers investors the highest standards of corporate disclosure, investor protection, and information environment followed by the UK, while continental Europe is closing the list. Thus, based on the the expectations of *Signalling*, *Bonding*, and *Investor recognition hypotheses* the first testable proposition is:

- *a foreign listing in the US yields the highest excess returns around cross-listing, a foreign listing in the UK – significant excess returns but lower compared to the excess returns around a US listing, while a European listing by a foreign company is not expected to have an impact on the stock price.*

3.2. Change of valuation impact of cross-listing Over Time

A number of important developments in financial markets took place in recent years that potentially could affect the benefits and costs of cross-listing in the US and in Europe. Firstly, the European integration process including the introduction and launch of the single European currency and the acceptance of 12 new countries in 2004 and 2007 into the European Union. Secondly, the vital changes in the regulatory environment that took place in recent years: the Sarbanes-Oxley Act of 2002 in the US, aimed at improving investor protection; and MIFID in the European Union, aimed at harmonizing and integrating the financial markets in the EU. Lastly, recent years are marked by changes in trading environment and the ‘new markets’ boom in Europe. Thus, AIM of London Stock Exchange, the most successful new market, has demonstrated tremendous growth rates in number of listed companies: from a total of 121 listed companies including 3 foreign companies at the end of 1995 (year of AIM launching) to a total of 1694 listed companies including 347 foreign companies in Dec 2007². The reality is that a number of European companies have de-listed from the US exchanges naming increased compliance costs as one of the main reasons for leaving the US market³. At the same time, the London Stock Exchange and other European exchanges are experiencing an increase in new listings (*Table I*).

This study investigates the price impact of international cross-listing during a broad period of time starting from listings in the 1970s and including the most recent foreign listings by European companies (up to 31 Dec 2007). To control for the changes in listing environment over time, the sample is arbitrarily split into listings that take place before 2000 and listings that take place in the 2000s, assuming that each of these sub-periods reflects different level of market integration and different listing, regulatory and trading environment. The proposition is:

- *the home market stock price reaction to foreign listings on various host markets changes over time (before 2000s and in the 2000s)*

Further, it is important to control for significant changes in listing environment that take place in each of the host market: adoption of the Sarbanes-Oxley Act of 2002 in the US, introduction of AIM in the UK, and launch of single European currency in Europe. The Sarbanes-Oxley Act of 2002 imposes even stricter disclosure and listing requirements and applies to all US public companies as well as to all non-US companies that choose to list on a US exchange. While Sarbanes-Oxley Act improves minority investor protection (and, thus, according to *Legal Bonding hypothesis*, should result in improved valuation), at the same time it tremendously increases the costs for listing companies. *Litvak (2008)* reports that cross-listing premium of companies that are subject to the Sarbanes-Oxley Act (SOX) has declined significantly since the law was enacted; particularly, SOX negatively affects smaller, riskier companies and companies from countries with strong investor protection. I put forward the following proposition to test:

- *the valuation impact of a US listing for European companies decreases after the adoption of the Sarbanes-Oxley Act of 2002*

The introduction of Alternative Investments Market (AIM) by the London stock exchange in the 1990s opened new capital market opportunities for smaller companies. The Main Market and AIM of London stock exchange offer different regulatory environment and listing costs, thus attracting different types companies. While some larger companies choose to list on AIM to avoid the regulatory burden of the Main Market (*Jenkinson and Ramadorai (2007)*), AIM is still mostly the market for smaller and younger companies that are not qualified to list on the Main Market. Taking into account the significant difference in compliance requirements between these two markets and based on *Legal bonding hypothesis* the proposition to test is as follows:

- *the stock price impact of the London's Main Market listing is significantly higher compared to the stock price impact of London's AIM listing for European companies*

The single European currency, Euro, was introduced in 1999 and launched in 2002 eliminating currency risk and encouraging cross-border equity trading within the Eurozone. The obvious outcome of introduction of a single currency is the increased market integration of European markets, which, based on *Market segmentation hypothesis*, ought to result in diminishing valuation benefits from cross-listing within Europe. The proposition is:

- *the introduction of the Euro had reduced the benefits of cross-listing within Eurozone*

The literature review shows that much of the empirical evidence on the valuation benefits of cross-listing is based on the experience of foreign companies listing in the US in the 1990s - the decade when the US market was particularly bullish and when the growth opportunities in the US were valued higher than in any previous time in history. This study aims to detach the valuation impact of foreign listings that take place in the late 1990s during the bullish period of the technology bubble, providing an evidence for *Market timing hypothesis*. The proposition is:

- *foreign companies that cross-listed during the bullish period of the technology bubble of the late 1990s have experienced particularly high stock returns around the cross-listing*

3.3 Market reaction to cross-listing and Listing- specific Characteristics

The nature of cross-listing varies significantly depending on a number of listing- specific characteristics including the following: whether the cross-listing is the first foreign listing for the company or not, whether the cross-listing involves raising capital or not, whether the company has OTC trading prior to the stock exchange listing or not. *Sarkissian and Shill (2008)* find that a first foreign listing has a more profound impact on the corporate valuation compared to the valuation impact of a consequent foreign listing. *Bancel et al. (2006)* examine the long-term performance of capital raising and non-capital raising ADRs and report that the variation in long-term stock performance after cross-listing in the US is mainly determined by company-level characteristics regardless whether the company raised capital in the US or not, in line with *Business strategy hypothesis*. On the other hand, need in external capital might signal high growth opportunities, which, according to *Signalling hypothesis*, would result in positive market reaction.

Listing on the US exchange is not the only possibility for a foreign company to make its shares accessible by US investors. Level 1 ADRs or Over-the-counter (OTC) listing is the easiest and fastest way to entry the US capital market. The main difference between OTC and stock exchange listings is the level of disclosure requirements: an OTC listing requires neither full SEC registration and disclosure nor US GAAP reporting. The sample in this study includes only stock exchange listing

events. However, for some companies in the sample the US stock exchange listing is an upgrade from an OTC listing resulting in the improved information disclosure. The prediction of the *Signalling and Bonding hypothesis* is the positive market reaction to the upgrade from OTC listing to stock exchange listing. At the same time, the upgrade does not bring significant changes in the stock's accessibility by US investors, and, based on the *Investor recognition* argument, should not have any impact on the stock's value. Moreover, a stock exchange listing involves additional substantial costs compared to an OTC listing. The proposition is:

- *the variation in stock price reaction to international cross-listing is determined by listing-specific characteristics, such as listing order, capital raising activity and presence of an OTC listing prior to the stock exchange listing*

3.4 Valuation impact of cross-listing and Company-level Characteristics

Existing research documents the importance of company-level characteristics in the corporate cross-listing decision. Firstly, *Pagano et al. (2002)* report that company size is one of the most distinctive features of cross-listed companies. Taking into account the fixed costs associated with listings on a foreign exchange and minimum issue size requirement by stock exchanges⁴, it is not surprising that mainly large companies choose to list on foreign exchanges. At the same time, in recent years new markets, such as AIM, attract listings by smaller companies. Further, *Doidge et al. (2007 WP)* argue that the recent decline in the number of cross-listings in the US is explained by changes in company characteristics, particularly, company size. From the theoretical point of view, smaller companies overcome greater information barriers and, thus, are expected, based on *Investor recognition hypothesis*, to have more profound positive market reaction around foreign listing. Further, company growth opportunities might be a value-sensitive indicator to market around foreign listing (*Signalling hypothesis*). *Doidge et al. (2004)* report a high correlation between company valuation, growth opportunities and cross-listing status. *Durnev and Kim (2005)* show that investment opportunities is one of the main determinants of a company's choice of governance and disclosure practices, which in turn are positively related to corporate valuation.

A higher valuation impact of cross-listing might result from the fact that the company's business is better understood in the host market where its peers are also listed. For example, technology firms potentially get better valuation by listing on NASDAQ. Thus, *Pagano et al. (2001)* find evidence that companies tend to list where their industry peers are listed and report that US stock exchanges particularly attract companies from high-tech industries. Both *Proximity Preference hypothesis* and

Business strategy predict the variation in market reaction around cross-listing depending on company's industry: the market reaction is positive if cross-listing takes place in a market where investors are familiar with company's industry and if the listing facilitates the company's competitive advantage over its industry peers. Additionally, controlling for industrial affiliation is important in order to take into account differences in assets structure, accounting practices and regulations among different industries. The proposition is:

- *the variation in stock price reaction to international cross-listing is determined by company-specific characteristics, such as company size, growth opportunities and industry affiliation*

4. Sample

In order to answer the stated research questions I construct the sample of European companies that cross-listed within continental Europe, in the UK and in the US. The initial dataset includes companies from all European markets available in *Datastream* that have their stock listed on one or more stock exchange outside of their home market. This dataset is cross-checked and supplemented by cross-listing data from major stock exchanges web-sites that attract listings of European companies: NYSE, NASDAQ, AMEX, LSE (including Main Market and AIM), Euronext (including Paris, Amsterdam, Brussels, Lisbon SEs), Frankfurt SE, Irish SE, Swiss SE, Borsa Italiana, Luxembourg SE. Data on ADRs comes from the Bank of New York and Citibank ADR databases⁵. Another source of information on foreign listings (company name, home market, host market and month and year of foreign listing) for the period of time prior to 1998, is the global dataset of foreign listings from studies by *Sarkissian and Shill (2004, 2008)*⁶. Finally, some cross-listing dates are obtained from *Factiva* news database. The final sample contains cross-listing events that take place on three US exchanges (AMEX, NASDAQ, and NYSE), two markets of the UK's LSE (Main Market and AIM) and seventeen other European exchanges.

Data from the stock exchanges and the ADRs databases is up to 31 Dec 2007. Preference stock listings are excluded from the analysis. Also, to make the results comparable between US and European listings, I exclude OTC and Portal listings keeping in the sample stock exchange listings only. Lastly, the sample is restricted to companies that have home market listing prior to the foreign listing and home market stock return data available in *Datastream*. Since analysis includes examination of the excess returns around two events: the cross-listing announcement and the cross-listing events itself, effectively there two samples used in this study: the sample of cross-listing announcement events and sample of cross-listing events. The sample of the cross-listing

announcement events is smaller due to unavailability of announcement dates for some cross-listing events in the latter sample.

4.1 Sample description: Cross-listing announcement events

The announcement dates for the cross-listing events in the sample are obtained from *Factiva* news database. The additional requirement is the availability of home market return data prior to the announcement date. The final cross-listing announcement events sample includes 254 cross-listing announcement dates by 210 companies⁷ from 21 European markets. The earliest announcement⁸ occurs on 2 Sep 1982 and the latest one - on 27 Dec 2007. *Panel A* of *Table II* provides the distribution of the sample of cross-listing announcement events by home region, host market and over time.

<Table II>

4.2 Sample description: Cross-listing events

Panel B of *Table II* provides the distribution of the sample of cross-listing date events for monthly analysis by home region, host market and over time. The sample of cross-listing dates for monthly analysis includes 497 cross-listing events by 344 companies⁷ from 18 European markets. The earliest cross-listing occurs in Jun 1975 and the latest one - in Dec 2007. There is additional requirement imposed: this sample is further subject to data availability of monthly risk factors (*Appendix I*).

5. Excess Returns around Cross-listing

5.1 Abnormal Returns around Cross-listing announcement

Abnormal returns for the event period (-10, 10) days around the announcement are estimated using a modified market model: $AR_{i,t} = R_{i,t} - R_{m,t}$, where $AR_{i,t}$ - abnormal returns of company i on day t ; $R_{i,t}$ - the return of company i on day t ; $R_{m,t}$ - market return on day t .

The cumulative abnormal returns (CARs) are calculated as the sum of abnormal returns of company i for the event window: $CAR_i = \sum_t AR_{i,t}$.

As a robustness test and to eliminate the impact of the outliers on the estimated mean CARs, I also calculate trimmed mean CARs (~5% of extreme observations trimmed on each end); these estimations are not reported and are not mentioned if there is no significant difference in the estimated mean CARs and trimmed mean CARs, but if the trimmed mean CARs are found to be significantly different from the estimated mean CARs, this fact is reported in the presentation of the findings.

Datastream Total Market indices return data in local currency is used as a proxy for daily market return for developed European countries and for emerging market where the index data is available; for the rest emerging markets *S&P / IFC market indices* return data is used instead.

<Table III>

Table III presents cumulative abnormal returns for (-10, 10) days event window around cross-listing announcement for the full sample of 254 events and for various sub-samples. On average, European companies experience positive and statistically significant excess returns of 1.8% within 21 working days around the announcement of cross-listing.

5.2 Excess Returns around the Cross-listing date

While most of the price reaction is expected around the announcement of the event, the previous research (*Foerster and Karolyi (1999)*) suggests that there is information both around the announcement as well as the cross-listing event itself. To take this into account and check the robustness of the findings on abnormal returns around cross-listing announcement, I examine excess returns around cross-listing date as well. The intention is to analyze excess returns for the event window that would, on average, cover the cross-listing announcement date and the listing event. The median distances between the announcement date and the cross-listing date in the sample of 33 days motivates the choice of the event window for monthly analysis of (-2,0) months around the cross-listing date.

To overcome the limitations⁹ of traditional event-study methodology, I use the alternative method of estimating abnormal returns - Jensen's alpha approach (following *Draper and Paudyal (2006)*). This method does not require return data availability for a long estimation period prior to the event. Furthermore, this approach allows estimation of excess returns within multifactor asset pricing framework with size (SMB) and book-to-market (HML) risk factors (*Fama and French (1996)*). For each event window, Jensen's alpha α_i is estimated by the following cross-sectional regression:

$$R_i - R_f = \alpha_i + b_{1i}(R_M - R_f) + b_{2i}SMB + b_{3i}HML + \varepsilon_i, \text{ where}$$

α_i - Jensen's alpha for the event window under analysis

$(R_i - R_f)$ - cumulative risk premium for company i for the event window under analysis

$(R_M - R_f)$ - cumulative market risk premium for the event window under analysis

SMB - cumulative difference in value-weighted returns between small market cap stocks and large market cap stocks for the event window under analysis

HML - cumulative difference in value-weighted returns between value (high book-to-market ratio) stocks and growth (low book-to-market ratio) stocks for the event window under analysis

Jensen's alpha indicates whether cross-listing company experiences abnormal returns around announcement/ listing event. Statistically significant negative alpha provides evidence of a loss while statistically significant positive alpha indicates positive abnormal returns.

The risk factors, market risk premium, SMB and HML, are calculated for all countries in the sample that contribute to the sample at least 10 cross-listing events. *Appendix I* explains the computation of the risk factors and presents estimated market risk premium, HML and SMB, and the correlation between HML and SMB (*Fama and French (1996)*) risk factors for eighteen European countries. The average market risk premium is positive (about 6.9% annualized rate), which is consistent with the risk aversion assumption. The average mean SMB factor is negative, and the average mean HML factor is positive. The correlation between SMB and HML is close to zero, which is consistent with the mimicking portfolios of *Fama and French (1996)*.

<Table IV>

As a robustness test and to eliminate the impact of the outliers on the alpha, I also estimate alphas for trimmed samples (excluding ~5% of extreme observations on each end); these estimations are not reported and are not mentioned if there is no significant difference in the estimated alphas for the full sample and for the trimmed sample, but if the trimmed-sample alpha is found to be significantly different from the estimated full-sample alpha, this fact is reported in the presentation of the findings.

Table IV reports excess return (alpha) for (-2, 0) months event window around cross-listing estimated within multifactor asset pricing model for the full sample of 497 cross-listing events and for subsamples. On average, a cross-listing company experiences a positive and statistically significant excess return of 1.5% during the period two months before and the month of the cross-listing.

6. Univariate Analysis of Excess Returns

Excess returns around cross-listing announcement and around cross-listing event are further estimated for a number of subsamples. The choice of the subsamples is motivated by the research questions: (1) by host market (US, UK, Europe) (2) over time: (2.1) by the period of time (before 2000, and 2000s) (2.2) US listings: prior and post Sarbanes-Oxley Act of 2002 (2.3) UK listings: Main Market vs AIM (3) by listing-specific characteristics: (3.1) by listing order (3.2) by capital raising activity (3.3) US listings: listings with prior OTC vs. without prior OTC (4) by company-level characteristics: (4.1) by company size (4.2) by industry affiliation.

6.1 Excess returns by the host market

Table III reports that the announcement of cross-listing both in the US and in the UK yields positive (significant at 5%) abnormal returns during (-10, 10) days around the announcement: 3.3% for the US listings and 2.7% for the UK listings; the difference in means for these two subsamples is statistically insignificant. Excess returns around the announcement of cross-listing on European exchanges are not statistically different from zero, and the differences in means between European listings and the US and the UK listings are statistically significant.

Monthly analysis of risk-adjusted excess returns for (-2, 0) months around cross-listing (*Table IV*) reveals no statistically significant difference in mean excess returns for US and European listings (mean excess returns for all subsamples are around zero). However, the Wald test suggests that the difference in estimated excess returns for UK listings (2.4%) and European listings (0.6%) is statistically significant at 10% level. Further, the robustness test shows that the estimated alpha for the trimmed subsample of US cross-listing events is 1.8% significant at 5% while the estimated alpha for the full subsample of US cross-listing events is found to be insignificant.

6.2 Excess returns over time

6.2.1 Excess returns by period of time: before and after year 2000

The analysis of sub-samples by period of time shows that cross-listing announcement results in positive and statistically significant abnormal returns for all periods of time: 1.3% before year 2000 and 2.5% in the 2000s; the difference in means is not statistically significant. Further analysis shows that the estimation of the CARs for the events that take place in the 2000s is significantly affected by the outliers: the trimmed mean CARs for these events are 1.4% but statistically insignificant due to the large variation of CARs in this subsample. Thus, the magnitude of the estimated abnormal returns around cross-listing announcement before 2000 and in the 2000s is compatible, however statistical significance is sufficient only for the cross-listing announcement events that take place before year 2000; the difference in trimmed means is still statistically insignificant. Analysis of monthly risk-adjusted excess returns for (-2, 0) months around a cross-listing does not reveal significant differences in estimates excess returns for subsamples by period of time. Further, the robustness test shows that the estimated alpha for trimmed subsample of cross-listing events that take place before year 2000 is 0.9% significant at 10% while the estimated alpha for the full subsample of events before year 2000 is found to be insignificant.

Panel 2.1 of *Tables 3* and *4* provide additional insight into the variation of excess returns for different periods of time for subsamples by the host markets. Thus, the announcement of cross-listing in the US yields positive abnormal returns (reported in *Table III*) of around 3% both before and after year 2000; however, this number is statistically significant only for US listings that take place before 2000. On the other hand, announcement of cross-listing in the UK yields positive and statistically significant abnormal returns only in recent years (5.1% significant at 5%) and the difference in means for two subsamples of UK listings before and after year 2000 is statistically significant at 10%. CARs around the announcement of a European listing are around zero for both periods of time.

Risk-adjusted excess returns (reported in *Table IV*) for (-2, 0) months around cross-listing are insignificant for both periods of time, except for UK listings that take place in the 2000s (8.0 % significant at 10%); according to the Wald test the difference in excess returns for UK listings before and after year 2000 is statistically significant at 5%. Further, the robustness test shows that the estimated alpha for trimmed subsample of US cross-listing events that take place before year 2000 is 1.8% significant at 10% while the estimated alpha for the full subsample of these events is found to be insignificant.

Figure 1 illustrates the changes in valuation impact of cross-listing announcement by host market and over time. It presents 3-year moving-average cumulative abnormal returns during (-10, 10) days around the cross-listing announcement for each host market. The lower chart of *Figure 1* presents the number of cross-listing announcement events in the sample by host market and by year of the cross-listing announcement.

<Figure 1>

US cross-listing announcement: 3-year average CARs around cross-listing announcement are positive for all periods except for the most recent period. Particularly high CARs are in the late 1980s – early 1990s years and in the second half of the 1990s. The obvious observation from *Figure 1* is the increased variation of CARs starting from year 2002 when, as discussed earlier, significant changes in the US regulatory environment took place. The number of the US cross-listing events is high in the second half of 1990s, peaks in year 2000 and starts declining afterwards. Two possible explanations of the sharp decline in number of cross-listing companies in 2003 and of the decrease in cross-listing announcement CARs in recent years are 1) the technology bubble burst (year 2000-2001) and 2) the change in regulatory environment (Sarbanes-Oxley Act of 2002).

UK cross-listing announcement: The UK listing yields the highest valuation impact in the period from 1984 to 1987 when so-called ‘Big Bang’ takes place in London (change in trading technology and, consequently, trading costs), however the number of UK listing events in the sample in this period of time is low. Period of 1990-1992 and 1996-1998 are characterized by negative cross-listing announcement CARs. Starting from year 1999, positive change in stock valuation is experienced by companies listing in London, which might be related to the introduction and rapid growth of Alternative Investments Market in the second half of the 1990s.

European cross-listing announcement: Cross-listing in Europe yields positive abnormal returns before year 1985 and during the period from 1993 to 1996. After year 1995 CARs are sharply declining, possibly, in anticipation of introduction of the single European currency Euro, and remain negative until 2001. In recent years, the valuation effect of European listing varies significantly with a positive pike in 2002. The listing environment in Europe in recent years is influenced (in different ways) by the following developments: increased integration of European markets after the Euro introduction and reduced compliance costs for a foreign listing company as a result of the adoption of the mutual recognition principle (enforced by FSAP of 1999). The number of cross-listing events within Europe has been increasing in the late 1980s and reached its peak in 1991; in the 1990s it stays relatively low with exception of year 1995 and 1999. Interestingly, in recent years the number of new cross-listing events still remains significant, despite the limited valuation benefits (based on the theoretical predictions and the empirical findings of this study) of cross-listing within Europe. Cross-listing within Europe in recent years might be motivated by the significant transaction costs of cross-border equity trading due to the segmented trading infrastructure in Europe.

6.2.2 Excess returns for US listings: prior and post Sarbanes-Oxley Act adoption

All US cross-listing events in the sample are divided into two subsamples relative to the adoption of the Sarbanes-Oxley Act (SOX): (1) cross-listing events that take place in the US before year 2002 and (2) cross-listing events that take place in the US in year 2002 and afterwards. *Panel 2.2 of Table III* reports, that CARs around the cross-listing announcement are positive and statistically significant (3.4% significant at 1%) prior to SOX adoption. For post-SOX subsample CARs around the cross-listing announcement are positive but not statistically significant; neither is statistically significant the difference in announcement CARs for prior and post SOX subsamples.

Monthly analysis of excess returns for (-2, 0) months around cross-listing (*Table IV*) fails to find a difference in excess returns for subsamples of cross-listing events that take place prior to and post

SOX adoption. Further, the robustness test shows that the estimated alpha for trimmed subsample of cross-listing events that take place after the adoption of SOX is statistically insignificant while the estimated alpha for the full subsample of post-SOX events is significant at 10%.

Overall, there is an evidence of higher cross-listing announcement CARs prior to SOX adoption; however, this result does not hold for monthly specification. Further, due to large fixed costs of cross-listing in the US after SOX adoption, I expected the impact of SOX to vary depending on company size. The forthcoming multivariate analysis simultaneously takes into account a number of factors including company size and post-SOX variable.

6.2.3 Excess returns for UK listings: Main Market listings and AIM listings

Panel 2.3 of Table III and Table IV report excess returns around the LSE's AIM and the Main Market listings. Contrary to the expectations, CARs around announcement of listing on AIM are 8.5% (significant at 10%) while CARs around announcement of listing on the Main Market are insignificant. Similarly, monthly risk-adjusted excess returns around the Main Market listing are insignificant while excess returns around listing on AIM are 12.8% (significant at 10%). The Wald statistics suggests that the difference in estimated excess returns for AIM and the Main Market listings is significant at 1%. The difference in types of companies that list on AIM and the Main Market is striking. Thus, the average market value of the company in the sample that announces listing on AIM is £17 million while the average market value of the company in the sample that announces listing on the Main Market is £844 million. Thus, potentially, the difference in excess returns between AIM and the Main Market listings is driven by company size.

6.3 Excess returns by Listing Characteristics

6.3.1 Excess returns by listing order

All observations in the sample are divided into two subsamples depending whether the cross-listing event is the first foreign listing by the company or not. Out of all foreign listing events by the same company, the first by chronological order foreign listing is classified as 'First foreign listing'; the other foreign listings by the company are classified as 'consequent foreign listing'.

As expected, a first foreign listing has stronger valuation impact than a consequent foreign listing. *Panel 3.1 of Table III* reports that CARs around a cross-listing announcement for the first cross-listing is 2.9% (significant at 5%), while it is insignificant for consequent cross-listings. The difference in mean CARs between first and consequent listings of 2.4% is statistically significant at 10%. These

results hold for US listings: announcement of first foreign listing in the US yields 5.3%, which is 4.3% more than for consequent listing, the difference in means is significant at 10%. For UK and European listings no statistically significant difference between valuation effects of announcement of the first and consequent cross-listings is detected.

Monthly risk-adjusted excess returns around cross-listing (*Panel 3.1 of Table IV*) are positive and significant (2.6%) for first foreign listings and are insignificant for consequent listings; the Wald statistics suggests that the difference in estimated alphas is statistically significant at 5%. These results strongly hold for European listings: when European cross-listing is the company's first foreign listing, it on average yields 3% excess returns (significant at 10%), while consequent European listing does not have an impact on company's stock returns; the difference in estimated excess returns for first and consequent European listings is statistically significant at 1%. Further, the robustness test shows that the estimated alpha for trimmed subsample of the 'First foreign' US cross-listing events is 2.3% significant at 10% while the estimated alpha for the full subsample of these events is found to be insignificant.

6.3.2 Excess returns by capital raising activity

All cross-listing events in the sample are classified as whether capital raising or non- capital raising depending whether the cross-listing involved raising new equity or not. Data on capital raising activity on foreign exchanges around cross-listing is obtained from *Bank of New York* and *Citibank ADRs databases* for ADRs and from *Thomson ONE Banker Equity Deals* database for direct listings. The announcement effects on stock price is positive and statistically significant for both capital raising and non- capital raising cross-listings, however, the valuation effect of capital raising listings is higher (3.9% vs. 1.2%) (*Panel 3.2 of Table III*). Analysis of subgroups by host market shows that while the announcement effect of capital raising listings has a higher magnitude compared to the valuation effect of non- capital raising listings, the difference is not statistically significant.

Monthly risk-adjusted excess returns (*Panel 3.2 of Table IV*) are higher for capital raising compared to non- capital raising listings for the full sample, the UK listings and European listings and according to the Wald test these differences are statistically significant. As to US listings, there is an opposite trend here: cross-listing in the US yields positive excess returns only if it does not involve raising new equity with the difference in estimated excess returns between capital-raising and non-capital raising listings being statistically significant. Overall, the capital raising option seems to be valued higher when listing takes place in Europe compared to listings in the US.

6.3.3 Excess returns for US listings: with prior OTC and without prior OTC

All US cross-listing events in the sample are divided into two subsamples based on whether the company had OTC trading prior to listing on the US stock exchange. All US listing events including OTC listings for each company are sorted in chronological order; if OTC listing date takes place before the stock exchange listing date, then the stock exchange listing event is classified as ‘US listings with prior OTC’.

Panel 3.3 of Table III and Table IV report excess returns around the US listing for companies that had OTC listing prior to stock exchange listing and for companies that did not have OTC listing. Statistically significant difference in excess returns for these two subgroups is found both for CARs around the cross-listing announcement and for monthly risk-adjusted excess returns. Companies that did not have OTC listing in the US prior to the stock exchange listing experience positive excess returns around cross-listing (4.4% CARs significant at 1% around the cross-listing announcement and 3.0% excess returns during (-2, 0) months around the cross-listing), while stock exchange listing does not add any value for companies that have had prior OTC listing (excess returns for these companies are not statistically significantly different from zero).

6.4 Excess returns by Company- level characteristics

6.4.1 Excess returns by company' size

Company size is measured by the natural log of the company's market value prior to the cross-listing. Market value data is obtained from *Datastream*. All observations in the sample are ranked into three groups based on company size prior to the cross-listing: small companies, average companies and large companies.

<Table V>

Panel A and B of Table V report that small companies experience the highest announcement CARs and monthly risk-adjusted returns: 2.7% and 4.5% respectively, both significant at 5%. As company size increases, excess returns become insignificant and finally, large companies experience losses around the cross-listing, however, not statistically significant. Overall, there is evidence of negative relationship between the valuation impact of international cross-listing and company size prior to the cross-listing.

6.4.2 Excess returns by industry

Company's industry affiliation data based on the FTSE/DJ Industry Classification Benchmark is obtained from *Datastream*. After combining several industry groups into one group¹⁰, the final

industry classification in this study includes six industry groups: Financials, Manufacturers, Natural resources, Services, Technology, and Healthcare. All observations in the sample are divided into six industry groups based on this classification.

<Table VI>

Table VI presents excess returns around the cross-listing for sub-samples by industry membership classified into six industry groups. The highest positive and statistically significant excess returns around the cross-listing are experienced by natural resources (oil & gas and utilities) companies. This result is particularly strong for European listings. Positive valuation impact of the cross-listing announcement for manufacturing companies (2% significant at 5%) is driven mostly by listings in the US (6% significant 5%).

Further analysis of excess returns during (-2, 0) months around the US listing by industry (not reported in the Table) reveals that an announcement of cross-listing by a technology company is accompanied by on average 7.4% excess returns (significant at 5%) when the listing takes place before year 2000 and -8.9% (significant at 10%) when the listing takes place after year 2000 (not reported in the Table). These findings can be interpreted as the evidence of the well-documented technology bubble in the late 1990s.

7. Determinants of the Market Reaction to Cross-listing: Multivariate framework

7.1 Multivariate analysis of CARs around cross-listing announcement

Determinants of cumulative abnormal returns for the event period (-10, 10) days around cross-listing announcement are evaluated using cross-sectional regressions: $CAR_i = \alpha_i + \sum X_{ni} + \varepsilon_i$, where CAR_i - cumulative abnormal return for (-10, 10) days around the cross-listing announcement by company i , X_{ni} - vector of time- specific, listing- specific and company- level variables. All explanatory variables used in cross-sectional analysis are defined and summarized in *Appendix 2*. Statistical significance of the coefficient estimates is evaluated using heteroskedasticity- and autocorrelation- consistent t -statistics (*Andrews (1991)*). *Table VII* presents output of series of these cross-sectional regressions.

<Table VII>

In the model 1 (*Table VII*) the cumulative abnormal returns around cross-listing announcement are regressed on the dummy variables representing host market, after-SOX US listing, US listing by companies that had OTC listing prior to the cross-listing, AIM listing, listing that takes place within the Eurozone after the Euro introduction, capital raising activity and, finally, first foreign listing. In this model specification only two variables are statistically significant: Host US and AIM (both

coefficient estimates are positive). After-SOX and prior-OTC have negative signs, while ‘Capital raising’, ‘First listing’ and Euro have positive signs.

After controlling for company size and price-to-book ratio (model specifications 2-6 of *Table VII*), negative coefficient of after-SOX dummy becomes statistically significant. Host US becomes even more significant determinant of abnormal returns after controlling for after-SOX and company size. While on average cross-listing in the US contributes +5.8% change in CARs, listing in the US that takes place after Sarbanes-Oxley Act introduction additionally contributes negative 6.0% change in CARs (model 2, *Table VII*), bringing the valuation impact of cross-listing in the US after introduction Sarbanes-Oxley Act close to zero. An additional evidence of the negative impact of the adoption of the Sarbanes-Oxley Act on the valuation impact of foreign listing is presented in *Appendix 3* that reports the estimation output of cross-sectional regressions of cumulative abnormal returns during (-10, 10) days around the cross-listing event on the set of explanatory variables. Post-SOX variable is negative and statistically significant at 10% in both model specifications.

Model 3 of *Table VII* additionally includes dummy variables representing company’s industry (six groups classification) and the dummy representing the period of positive returns during the technology bubble of the late 1990s (Tech. Bubble dummy). Along with after-SOX variable, the dummy variable representing US listings by companies that have prior OTC listing has negative and statistically significant coefficient estimate. Industry affiliation is found to be a significant determinant of CARs around cross-listing announcement: more specifically, dummy variables representing natural resources companies and technology companies that list in the US have positive and statistically significant coefficient estimates. Moreover, the technology bubble variable has positive and statistically significant coefficient estimate even after controlling for industry membership and other factors. An additional evidence of the significant impact of technology bubble in explaining market reaction to foreign listings is reported in *Appendix 3*: the technology bubble dummy variable is statistically and economically significant determinant of the CARs during (-10, 10) days around the cross-listing event. This evidence suggests that during the period of the technology bubble of the late 1990s investors paid particularly high premiums for equity of foreign companies.

7.2 Multivariate analysis of Monthly risk-adjusted excess returns

Determinants of monthly risk-adjusted excess returns for the event window (-2, 0) months around the cross-listing date are evaluated using cross-sectional regression:

$R_i - R_f = \alpha_i + \beta_{1i}(R_m - R_f) + \beta_{2i}SMB + b_{3i}HML + \sum X_{ni} + \varepsilon_i$, where X_{ni} – vector of time- specific, listing-specific and company- level variables defined and summarized in *Appendix 2*. Statistical significance of the coefficient estimates is evaluated using heteroskedasticity- and autocorrelation- consistent t -statistics (*Andrews (1991)*). *Table VIII* presents output of several specifications of this regression.

<Table VIII>

In all model specifications coefficient estimate on market risk premium is highly significant and in the most cases is around 1.1 suggesting that a cross-listing company, on average, is riskier than the market. In the model specification 1 of *Table VIII*, which does not include such variables as company size and growth opportunities, SMB and HML risk factors are insignificant; the only statistically significant coefficient estimates are on the prior-OTC dummy variable (negative contribution) and the AIM dummy variable (positive contribution), both significant at 5%. After controlling for company size and growth opportunities (Models 2 and 3 of *Table VIII*), coefficient estimate on HML risk factor becomes positive, however, statistically insignificant; at the same time coefficient estimate on SMB risk factor becomes highly significant and positive in all model specifications. Further, after controlling for company size and price-to-book ratio, prior-OTC and AIM dummy variables keep the same sign (prior-OTC – negative, AIM – positive) but their statistical significance reduces substantially. The only significant coefficient estimate, besides market risk factors, is on ‘First listing’ variable – positive contribution of 3.8%.

In line with findings of analysis of CARs around cross-listing announcement, the estimation output of model 3 of *Table VIII* shows that coefficient estimate is positive and significant for dummy variable representing natural resources companies. Coefficient estimate for dummy variable representing the bullish period of technology bubble is positive (around 6%), but its statistical significance is not sufficient – significant at 15% only (model 3). Not in line with findings on announcement CARs, coefficient estimate on after-SOX dummy variable is not statistically significantly different from zero.

8. Discussion of Empirical Findings

The study compares the market reaction to listing in the US, in the UK and within Europe by European companies and examines the determinants of the excess returns of cross-listing companies around the cross-listing announcement and around the cross-listing event. In line with existing empirical evidence (*Miller (1999)*, *Foerster and Karolyi (1999)*), on average, cross-listing is a positive signal to investors and results in positive excess returns for the listing company: cumulative abnormal returns of 1.8% during (-10, 10) days around the cross-listing announcement and 1.5% during (-2, 0)

months around the cross-listing. The stock price adjustment takes place mostly around the announcement and not around the listing date which can be attributed to the efficiency of financial markets. It is important to notice that the magnitude of the average stock price reaction around the announcement foreign stock exchange listing detected in this study is lower than reported in earlier studies that used sample of cross-listing events that take place before year 2000. Further, in line with the findings of *Sarkissian and Shill (2008)*, the valuation impact is particularly strong when the cross-listing event is the company's first foreign listing with excess returns of 2.9% around the announcement and 2.4% during (-2, 0) months around the cross-listing; the valuation impact of consequent foreign listings is insignificant. This empirical evidence might be interpreted in favour of *Investor recognition hypotheses*: a first foreign listing results in considerable increase in the investor base of the company and, accordingly, in the significant market reaction to the foreign listing, while the marginal increase in the investor base from consequent foreign listings is insignificant so is the market reaction.

As predicted by *Signalling, Bonding and Investor recognition hypotheses*, a US cross-listing announcement generates the highest positive and significant abnormal returns for the listing company of 3.3%, followed by a *UK cross-listing* announcement (2.7%), while the average excess returns around a cross-listing announcement on *European exchanges* are insignificant. The pattern of abnormal returns around cross-listing announcement on various markets in this study is similar to the findings of *Roosenboom and Van Dijk (2007 WP)*. I find that a *US cross-listing* announcement generates positive and significant abnormal returns for the listing company particularly when the cross-listing takes place before year 2000 (3.1% significant at 1%), prior to the adoption of the Sarbanes-Oxley Act of 2002 (3.4% significant at 1%), when cross-listing is the first foreign listing by the company (5.3% significant at 5%), when the cross-listing company have not had an OTC listing in the US prior to the stock exchange listing (4.4% significant at 5%), and when the cross-listing does not involve raising new equity (2.8% significant at 5%). On the other hand, a *UK cross-listing* announcement generates positive and significant abnormal returns for the listing company particularly when the cross-listing takes place after year 2000 (5.1% significant at 5%) and when the listing takes place on the AIM of the London Stock Exchange (8.5% significant at 10%). A *European cross-listing* announcement does not generate significant abnormal returns for any of the subsamples analysed, contrary to the prediction of *Proximity preference hypothesis*. Excess risk-adjusted returns around a cross-listing on European exchanges are positive and significant only when the European cross-listing is the first foreign listing of the listing company (2.9% significant at 10%).

One of the contributions of this study is the empirical evidence on how the market reaction to foreign listing changes on various markets changes over time. I find no convincing evidence that the excess returns around international cross-listing are diminishing over time: the difference in estimated mean excess returns around cross-listing that take place before year 2000 and in the 2000s is statistically insignificant. I do find that the variation in cross-listing excess returns has increased after year 2000 causing the low statistical significance of estimated mean excess returns in this subsample. A cross-listing in the US yields positive and significant excess returns if it takes place before year 2000, while those are statistically insignificant if the listing takes place in the 2000s. In contrast, the attitude of investors towards a UK listing changes in recent years: the market reaction to the cross-listing in the UK becomes positive and significant after 2000; the difference in mean CARs for the events that take place before 2000 and after 2000 is statistically significant. Moreover, risk-adjusted excess returns estimated for (-2, 0) months around the cross-listing for various subsamples by host and by period of time is significant only for UK listings that take place in 2000s (8.1% significant at 10%). The findings that the market reaction to a UK listing improves over time while the market reaction to a US listing deteriorates over time can be interpreted as additional evidence in the support of the argument of *Zingales (2007)* regarding the US capital market losing its competitive edge. Finally, European listing does not affect the stock returns of the listing European company in any of the time periods. Furthermore, there is no evidence revealed that the introduction of the Euro affects the market reaction to cross-listing within the Eurozone. Overall, the empirical findings on the change in the stock price reaction to foreign listing over time do not support the *Market segmentation hypothesis*: the significant variation in the excess returns over time is determined by factors other than the level of increasing over time market integration.

The reported variation in the market reaction to cross-listing over time on different host markets is driven by the specific events that take place on each of the markets. Thus, the valuation impact of a US cross-listing announcement is affected by the adoption of the Sarbanes-Oxley Act of 2002: the abnormal returns around US listings that take place prior to the adoption of the Sarbanes-Oxley Act is 3.4% and significant at 1%, while they are statistically insignificant for US listings that take place after the adoption of SOX in 2002. Furthermore, the multivariate analysis of excess returns reveals that, after controlling for company size and price-to-book ratio, the cross-listing announcement valuation premium gets cancelled by the after-SOX valuation discount: the absolute value of the negative contribution of after-SOX variable is higher in magnitude than the absolute value of the contribution of the 'Host US' variable. However, the impact of the Sarbanes-Oxley Act of 2002 is not found to be

significant for monthly risk-adjusted excess returns for (-2,0) months around cross-listing. While the previous studies have reported the negative impact of SOX on the relative valuation of foreign companies listed in the US (*Litvak (2008)*) and the negative market reaction around major events surrounding the passage of SOX (*Litvak (2007)*, *Zhang (2007)*, *Doidge, Karolyi and Stulz (2008)*), this study is the first to compare the market reaction to a foreign listing in the US before and after the adoption of the Sarbanes-Oxley Act.

Another contribution of this study is the comparison of the stock price reaction to foreign listing by European companies on the Main Market and AIM segments of the London Stock Exchange. The analysis reveals that the reported variation in the market reaction to UK cross-listing over is affected by the introduction of the AIM of the London Stock Exchange. I find that significant positive excess returns around UK listings in recent years are driven by AIM listings: excess returns around AIM listings are positive and statistically significant while a Main Market listing has no stock price impact; the difference in AIM and Main Market listing excess returns is statistically significant. This finding can be interpreted as additional evidence in the support of the argument proposed by *Jenkinson and Ramadorai (2007)* that investors that are comfortable with the level of regulation provided by AIM become the dominant investors of the AIM-listed companies, which, on average, are small, young and fast-growing companies. Analysis reveals that the disparity in excess returns around the Main Market and AIM listings is mainly explained by the size of the listing company - in the multivariate analysis the coefficient estimate on the 'AIM listing' dummy variable loses its statistical significance after controlling for company size.

The empirical findings on the impact of the adoption of the Sarbanes-Oxley Act in the US and of the introduction of AIM in the UK, which in both cases is determined by the difference in the level of regulation, are contrary to the expectations of *Signalling* and *Legal bonding hypotheses*. I find that a listing on a market with less strict disclosure requirements (US market prior to SOX vs. post SOX and the Main Market of the LSE vs. AIM of the LSE in the UK) yields higher excess returns for the listing company compared to a listing on a market with more stringent disclosure requirements. The evidence that a listing on the market with less strict regulation environment results in higher excess returns compared to excess returns around a listing on the market with more strict regulation environment (prior- vs. post-SOX and AIM vs. Main Market) might be explained by the significant compliance costs that incur as a result of stricter regulations and disclosure requirements - both direct listing and compliance costs as well as indirect costs such as managerial time devoted to compliance with the regulation instead of managing operating activities. The negative market reaction to listing on market

with stricter regulations might indicate that investors evaluate the benefits of improved information and legal environment in conjunction with the costs involved for listed companies and benefits do not always outweigh the costs.

Furthermore, I test whether the level of the disclosure requirements affects the market reaction to the cross-listing by comparing the excess returns around US listings by companies that had an OTC listing prior to the cross-listing and by companies that have not had an OTC listing prior to the cross-listing. This analysis reveals a statistically significant difference in the cross-listing announcement abnormal returns depending on whether the company had an OTC listing prior to the stock exchange listing in the US. Contrary to the expectations of *Legal bonding hypothesis* and in contrast to the evidence of *Miller (1999)* and *Doidge et al (2004)*, on average, only companies that have not had prior OTC listing experience positive and significant excess returns around a US listing, while an upgrade from OTC listing to a stock exchange listing does not affect the stock valuation. This result is robust to different excess returns calculation methods and holds in univariate as well as multivariate analyses. While *Miller (1999)* shows that a stock exchange listing in the US has higher valuation impact compared to an OTC listing for non-US companies, his sample includes only initial US listings by non-US companies and, thus, excludes the events of up-grade from an OTC to a stock exchange listing. Therefore, my findings on this issue are not contrary but rather supplementary to the existing empirical evidence. I interpret these findings as additional evidence that the value of the foreign listing is perceived by the market net of the listing and compliance costs. In the case of up-grade from US OTC to US stock exchange listing the stock's accessibility to investors does not change significantly, and, thus, according to *Investor recognition hypothesis*, should not affect the stock valuation, however, the significant change in the level disclosure requirements improves information environment and investor protection but at the same time considerably increases listing and compliance costs for the cross-listed company. It seems that the market believes that the costs outweigh the benefits of better investor protection.

The next contribution of this research is the examination whether foreign companies received additional valuation premium from international cross-listing during the bullish period of the technology bubble of the late 1990s. Indeed, the multivariate analysis reveals that companies that cross-list during the technology bubble have got higher excess returns around the cross-listing, significant even after controlling for the company's industry and other factors. Furthermore, I find that the number of companies that cross-list peaks in the year of the bubble. These findings provide an empirical support for the *Market Timing hypothesis* and show that companies time a foreign listing

according to the market conditions of the host market (in line with the conclusions of *Sarkissian and Shill (2008 WP)*) and, at the same time, investors pay premiums for foreign equity during the bullish period of the bubble.

Lastly, I find that company-level factors are the important determinants of the market reaction to foreign listing. Firstly, in line with the findings of *Roosenboom and Van Dijk (2007 WP)*, the company size is found to have a significant negative impact on the excess returns around the cross-listing: on average, only small companies in the sample experience positive and statistically significant excess returns around cross-listing. This finding can be interpreted as evidence in favour of *Investor recognition hypothesis* on the company-level: the smaller the company the higher information barrier that it overcomes when cross-lists on a foreign exchange, which, in turn, explains more profound market reaction to the cross-listing. Furthermore, I find that company industrial affiliation is an economically and statistically significant factor in explaining excess returns around cross-listing. Analysis reveals that companies operating in the natural resources industry enjoy the highest valuation impact from international cross-listing. This result is robust to various excess returns calculation methods and model specifications. The significance of company-specific factors in explaining market reaction to foreign listing favours *Business strategy hypothesis* that states that foreign listing is beneficial only if it fits the company's overall strategy and takes into account the company's industry trends. Further, there is no conclusive evidence found regarding the impact of the capital raising activity on a foreign exchange on the stock price reaction to the listing, which as well can be interpreted as evidence in favour of *Business strategy hypothesis*, similarly to the argument of *Bancel et al (2006)*.

Overall, the empirical evidence reported in this study is in favour of *Market timing* and *Business strategy hypotheses* while no empirical support found for *Market segmentation*, *Signalling*, *Legal bonding* and *Proximity preference hypotheses*.

9. Conclusion

To conclude, while on average a cross-listing by a European company is a value-enhancing corporate event, there is a large variation in market reaction to a foreign listing. A company that is deciding to list on a foreign exchange in order to improve stock valuation must take into account market conditions, industry-specific trends and more importantly, carefully weigh the listing costs, both direct and indirect, against potential benefits.

Footnotes

1. there are two common approaches used in financial research to investigate the valuation effects of international cross-listing: event study framework that examines stock price behaviour around cross-listing event and/or around announcement of cross-listing, and cross-sectional studies that compare average valuation of cross-listed companies to average valuation of companies that list on home exchange only using relative valuation ratios. The literature review in this study focuses on studies investigating stock price reaction to cross-listing within the event study framework.
2. source: *LSE statistics* www.londonstockexchange.com
3. for example, British Airways delists its shares from the NYSE because of rising costs of compliance with Sarbanes-Oxley. This delisting saves the company £10 mln a year. Source: *The Evening Standard*, 25 Apr 2007
4. for example, a listing on the main market of LSE costs at least £500,000 in professional fees; also, LSE requires the minimum ADRs issue size of £700,000. Source: LSE www.londonstockexchange.com
5. available on-line BNY: <http://www.adrbny.com/> and Citibank: <http://www.citissb.com/adr/www>
6. I am very grateful to Professor Sarkissian for making this dataset publicly available via his web-site
7. there is difference in the number of the events and in the number of companies because some companies in the sample have two or more foreign listings
8. the availability of the announcement date in the earlier years is limited as it is subject to the news database availability. One of the main sources of announcement information, the Reuters Financial Services, is available only from 1987
9. simply market-adjusted abnormal returns for the event window (-2,0) months around cross-listing are not reliable since this approach disregards risk factors. The conventional event-study methodology (Brown and Warner (1985)) with a market model as a benchmark also has a number of limitations. First, the market model fails to control for additional market risk factors such as size and book to market (Fama and French (1996)). Second, this approach requires estimation of model parameters using return data over rather long (approximately five years based on monthly data frequency for stable and reliable parameter estimates) estimation period, which must be independent of the event. In case of cross-listing, companies often choose to list on a foreign exchange within a few years after listing on a home exchange. Consequently, in many cases home market stock price data is available for a limited time period prior to cross-listing and using conventional event-study approach would cause the sample to be reduction by more than half
10. Basic Materials, Consumer Goods, and Industrials are combined into one group: 'Manufacturers'; Oil & Gas and Utilities are combined into one group: 'Natural resources'; and Technology and Telecommunications are combined into one industry group: 'Technology'

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Table I. Number of Listed Foreign Companies on major US and European Exchanges

The table reports the number of listed international companies (absolute and as percentage of total listed companies) on AMEX, NYSE, NASDAQ, LSE Main Market and AIM, Deutsche Borse (Frankfurt SE official regulated market) and Euronext (consolidated statistics for Paris, Amsterdam, Brussels and Lisbon) for the period of time from 1999 to 2007. The sources of data include: World Federation of Exchanges (<http://www.world-exchanges.org>), LSE (www.londonstockexchange.com), Deutsche Borse (<http://www.deutsche-boerse.com>), Euronext (<http://www.euronext.com>).

	2007	2006	2005	2004	2003	2002	2001	2000	1999
AMEX									
Number of foreign listed companies	104	100	100	73	55	48	48	51	na
% of total listed companies	17%	17%	17%	13%	10%	8%	8%	8%	na
NYSE									
Number of foreign listed companies	421	451	452	459	466	472	461	433	406
% of total listed companies	18%	20%	20%	20%	20%	20%	19%	18%	13%
NASDAQ									
Number of foreign listed companies	307	321	332	340	343	381	445	488	429
% of total listed companies	10%	10%	10%	11%	10%	10%	11%	10%	9%
London SE Main Market									
Number of foreign listed companies	341	330	334	351	381	419	453	501	499
% of total listed companies	22%	21%	20%	19%	20%	20%	20%	21%	20%
London SE AIM									
Number of foreign listed companies	347	306	220	116	60	50	42	31	22
% of total listed companies	20%	19%	16%	11%	8%	7%	7%	6%	6%
Frankfurt SE Official Regulated Market									
Number of foreign listed companies	105	104	116	159	182	177	180	187	192
% of total listed companies	12%	14%	15%	19%	21%	26%	27%	29%	30%
Euronext									
Number of foreign listed companies	225	256	293	334	346	370			
% of total listed companies	19%	21%	23%	25%	25%	25%			
Total: major US exchanges									
Number of foreign listed companies	832	872	884	872	864	901	954	972	
% of total listed companies	14%	15%	15%	14%	14%	14%	13%	13%	
Total: major European exchanges									
Number of foreign listed companies	1,018	996	963	960	969	1,016			
% of total listed companies	19%	19%	19%	19%	20%	20%			

Table II. Sample Distribution

The table reports the total number of cross-listing events in the sample and the number of the events in the subsamples by period of time and by host market. *Panel A* provides description of the sample of cross-listing announcement events. *Panel B* provides description of the sample of cross-listing events for monthly analysis.

Panel A. Sample of Cross-listing Announcement Events							
Home region	# of listings	By period of time			By Host		
		Before 1990	1990s	2000s	US	UK	Europe
Sample	254	45	112	97	104	48	102

Panel B. Sample of Cross-listing Events for Monthly analysis							
Home region	# of listings	By period of time			By Host		
		Before 1990	1990s	2000s	US	UK	Europe
Sample	497	104	240	153	191	83	223

Table III. Daily Analysis: Cumulative Abnormal Return (-10,10) days around Cross-listing Announcement

The table reports mean cumulative abnormal return for (-10,10) days window around cross-listing announcement for full sample of 254 cross-listing announcement events and for subsamples by host market, by period of time and by listing characteristics. Abnormal returns are market adjusted returns. *Datastream* Total Market index in local currency for each market is used as a proxy for the market return. Cumulative abnormal returns are calculated as sum of abnormal returns for each stock for each event window. The table also reports probability (p) of t -statistics and number of observations for each subsample. Additionally the table reports difference in means and probability (p) of t -statistics for difference in means for paired subsamples. ‘***’ indicates significant at 1%, ‘**’ indicates significant at 5% and ‘*’ indicates significant at 10%.

	All			US listings			UK listings			European listings		
	mean	p	N	mean	p	N	mean	p	N	mean	p	N
Panel 1: Full sample and By Host												
Full sample	0.018***	0.01	254	0.033**	0.01	104	0.027**	0.04	48	-0.002	0.78	102
<i>difference (US-UK)</i>	<i>0.006</i>	<i>0.75</i>										
<i>difference (US-Europe)</i>	0.035**	0.02										
<i>difference (UK-Europe)</i>	0.029**	0.05										
Panel 2: Over time												
Panel 2.1: By period of time												
before 2000	0.013**	0.03	157	0.031**	0.01	55	0.003	0.83	24	0.003	0.71	78
2000s	0.025*(1)	0.08	97	0.035	0.18	49	0.051**	0.02	24	-0.019	0.31	24
<i>difference (1-2)</i>	<i>-0.012(2)</i>	<i>0.43</i>		<i>-0.004</i>	<i>0.89</i>		<i>-0.047*</i>	<i>0.06</i>		<i>0.022</i>	<i>0.28</i>	
Panel 2.2: For US listings: prior vs post SOX												
Prior SOX				0.034**	0.01	83						
Post SOX				0.029	0.50	21						
<i>difference (1-2)</i>				<i>0.004</i>	<i>0.93</i>							
Panel 2.3: For UK listings: Main Market vs AIM												
AIM							0.085*	0.07	9			
Main Market							0.014	0.26	39			
<i>difference (1-2)</i>							<i>0.071</i>	<i>0.13</i>				
Panel 3: By listing characteristics												
Panel 3.1: By listing order												
First	0.029***	0.01	134	0.053**	0.02	54	0.026	0.13	33	0.003	0.78	47
Consequent	0.005	0.48	120	0.011	0.35	50	0.030	0.16	15	-0.007	0.55	55
<i>difference (1-2)</i>	0.024*	<i>0.07</i>		<i>0.043</i>	<i>0.09</i>		<i>-0.005</i>	<i>0.86</i>		<i>0.010</i>	<i>0.53</i>	
Panel 3.2: By Capital raising activity												
Capital raising	0.039*	0.06	55	0.044	0.18	31	0.048	0.19	12	0.018	0.57	12
Not capital raising	0.012*	0.07	199	0.028**	0.03	73	0.020	0.13	36	-0.005	0.54	90
<i>difference (1-2)</i>	<i>0.027</i>	<i>0.21</i>		<i>0.015</i>	<i>0.66</i>		<i>0.028</i>	<i>0.46</i>		<i>0.022</i>	<i>0.48</i>	
Panel 3.3: For US listings: with prior OTC vs without prior OTC												
no prior OTC				0.044**	0.01	75						
prior OTC				0.025	0.87	29						
<i>difference (1-2)</i>				0.042*	<i>0.07</i>							

(1) trimmed mean=0.014 $p=0.22$ N=87

(2) trimmed difference=-0.001 $p=0.90$

Table IV. Monthly Analysis: Excess Return (-2,0) months around Cross-listing

The table reports excess return (alpha) for (-2,0) months window around cross-listing for full sample of 497 cross-listing events and for subsamples by host market, by period of time and by listing characteristics. The excess return (alpha) is estimated with 3-factor model: $R_i - R_f = \alpha_i + b_{1i}(R_M - R_f) + b_{2i}SMB + b_{3i}HML + \varepsilon_i$

The value of alpha from the above model is reported in the table. The table also reports probability (*p*) of *t*-statistics on the coefficient estimate and number of observations for each subsample. Additionally the table reports probability (*p*) of Wald test. ‘***’ indicates significant at 1%, ‘**’ indicates significant at 5% and ‘*’ indicates significant at 10%.

	All			US listings			UK listings			European listings		
	mean	<i>p</i>	N	mean	<i>p</i>	N	mean	<i>p</i>	N	mean	<i>p</i>	N
Panel 1: Full sample and By Host												
Full sample	0.015*	0.08	497	0.017(1)	0.20	191	0.024	0.30	83	0.006	0.57	223
Wald test (US-UK)		0.76										
Wald test (US-Europe)		0.31										
Wald test (UK-Europe)		0.09*										
Panel 2: Over time												
Panel23.1: By period of time												
before 2000	0.008(2)	0.34	344	0.012(3)	0.35	115	-0.010	0.74	53	0.008	0.46	176
2000s	0.027	0.16	153	0.027	0.35	76	0.081*	0.07	30	0.013	0.71	47
Wald test		0.33			0.61			0.04**			0.88	
Panel 2.2: For US listings: prior vs post SOX												
Prior SOX				0.007	0.64	155						
Post SOX				0.062*(4)	0.08	36						
Wald test					0.12							
Panel 2.3: For UK listings: Main Market vs AIM												
AIM							0.128*	0.09	12			
Main Market							0.010	0.69	71			
Wald test								0.00***				
Panel 3: By listing characteristics												
Panel 3.1: By listing order												
First	0.024*	0.06	271	0.020(5)	0.29	118	0.003	0.93	51	0.029*	0.09	102
Consequent	0.003	0.71	226	0.005	0.74	73	0.044	0.18	32	-0.013	0.31	121
Wald test		0.02**			0.28			0.22			0.00***	
Panel 3.2: By Capital raising activity												
Capital raising	0.034	0.23	73	-0.010	0.73	42	0.061	0.32	16	0.109	0.13	15
Not capital raising	0.010	0.24	424	0.023	0.12	149	0.015	0.56	67	-0.003	0.77	208
Wald test		0.00***			0.03**			0.07*			0.00***	
Panel 3.3: For US listings: with prior OTC vs without prior OTC												
no prior OTC				0.030**	0.04	153						
prior OTC				-0.046	0.155	38						
Wald test					0.02**							

(1) trimmed-sample alpha=0.018** *p*=0.03 N=171

(2) trimmed-sample alpha=0.009* *p*=0.09 N=310

(3) trimmed-sample alpha=0.018* *p*=0.07 N=103

(4) trimmed-sample alpha=0.034 *p*=0.14 N=32

(5) trimmed-sample alpha=0.023* *p*=0.06 N=106

Figure 1. CARs around Announcement of the US, UK and European Cross-listing by Year

Figure below presents 3-year moving average cumulative abnormal returns (-10, 10) days around announcement of cross-listing in the US, UK and Europe by year of cross-listing announcement. 3-year moving-average CARs are calculated as follows: mean CARs for each year are cumulated for (-1, 1) years period and divided by three. Out of 254 all cross-listing announcement events, 104 are announcement of listing in the US, 48 – in the UK and 102 – in Europe. The lower figure presents the number of cross-listing announcement events in the sample by host market and by year of cross-listing announcement.

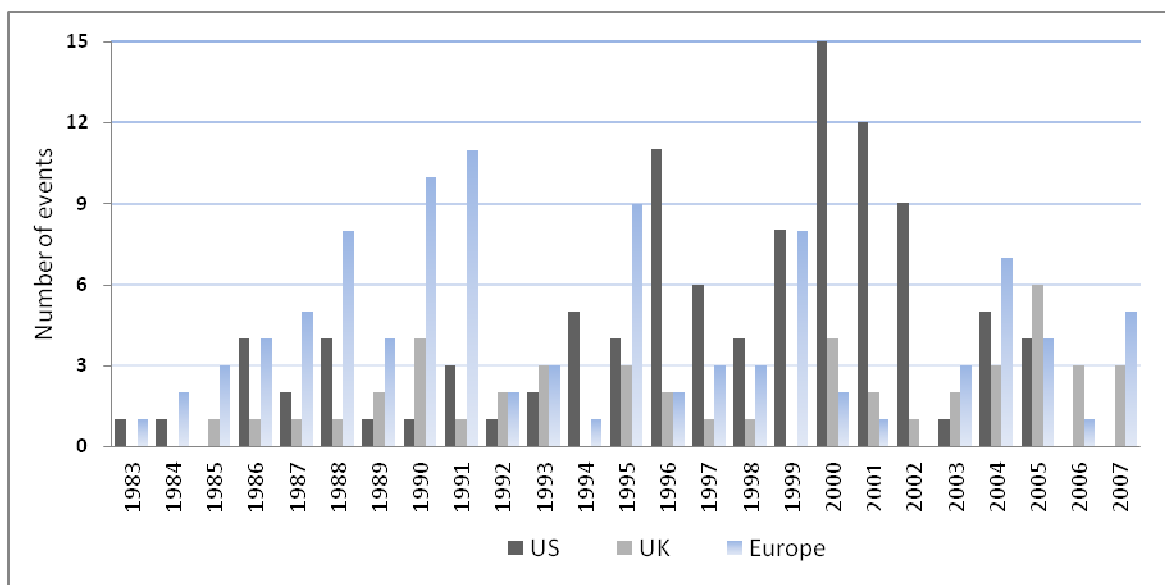
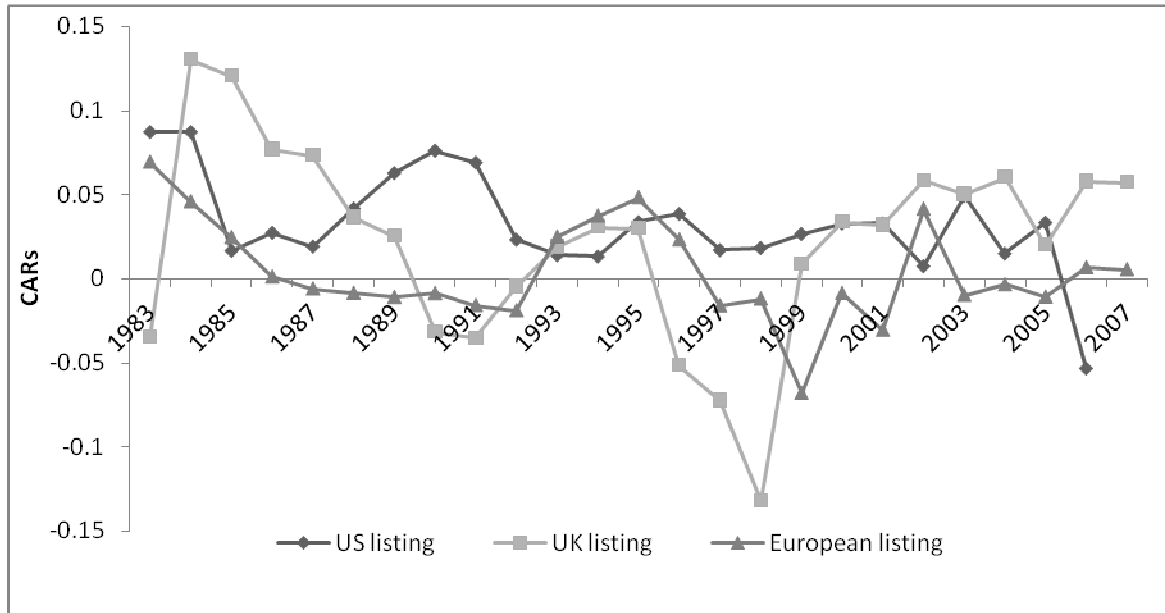


Table V. Excess Return around Cross-listing by Company Size

The table reports excess returns around cross-listings for groups by company size measured as natural log of market value of company's common stock prior to cross-listing. *Panel A* of the table reports mean cumulative abnormal return for (-10,10) days window around 240 cross-listing announcement events for groups by company size. *Panel B* of the table reports excess return (alpha) for (-2,0) months window around 396 cross-listing events for groups by company size. The excess return (alpha) is estimated with 3-factor model:

$$R_i - R_f = \alpha_i + b_{1i}(R_M - R_f) + b_{2i}SMB + b_{3i}HML + \varepsilon_i .$$

The table also reports probability (*p*) of *t*-statistics on the coefficient estimate and number of observations for each subsample. '***' indicates significant at 1%, '**' indicates significant at 5% and '*' indicates significant at 10%.

Panel A. Announcement Date Events				
	avr. company size (mln £)	mean CARs	p	N
Small	104.6	0.027**	0.03	80
Medium	1,514.0	0.025*	0.10	80
Large	10,890.9	-0.0005	0.95	80

Panel B. Cross-listing Date Events: Monthly analysis				
	avr. company size (mln £)	alpha	p	N
Small	102.4	0.045**	0.03	132
Medium	1,590.2	0.017	0.28	132
Large	10,109.7	-0.007	0.55	132

Table VI. Excess Return around Cross-listing by Industry membership

The table reports excess returns around cross-listings for six groups by industry membership. *Panel A* of the table reports mean cumulative abnormal return for (-10,10) days window around 254 cross-listing announcement events for industry groups for all sample and for subsamples by host. Abnormal returns are market adjusted returns. *Datastream* Total Market index in local currency for each market is used as a proxy for market return. Cumulative abnormal returns are calculated as sum of abnormal returns for each stock for each event window. The table also reports probability (*p*) of *t*-statistics and number of observations for each subsample. *Panel B* of the table reports excess return (alpha) for (-2,0) months window around 497 cross-listing events for industry groups for all sample and for subsamples by host. The excess return (alpha) is estimated with 3-factor model:

$$R_i - R_f = \alpha_i + b_{1i}(R_M - R_f) + b_{2i}SMB + b_{3i}HML + \varepsilon_i$$

The table also reports probability (*p*) of *t*-statistics on the coefficient estimate and number of observations for each subsample. ‘****’ indicates significant at 1%, ‘***’ indicates significant at 5% and ‘*’ indicates significant at 10%.

Panel A. Announcement Date Events												
	All sample			US listings			UK listings			European listings		
	mean	<i>p</i>	N	mean	<i>p</i>	N	mean	<i>p</i>	N	mean	<i>p</i>	N
Financials	-0.006	0.45	50	-0.025	0.18	17	0.012	0.53	8	0.000	0.96	25
Healthcare	0.033	0.22	28	0.028	0.48	18	0.093	0.12	4	0.010	0.77	6
Manufacturers	0.018**	0.05	102	0.056**	0.04	36	0.023	0.20	23	-0.005	0.72	43
Nat. resources	0.042**	0.03	22	0.078**	0.02	9	-0.026	0.59	5	0.042***	0.01	8
Services	0.012	0.50	22	-0.027**	0.05	8	0.055	0.29	7	0.014	0.33	7
Technology	0.012	0.62	30	0.053	0.14	16	0.030	-	1	-0.039	0.27	13

Panel C. Cross-listing Date Events: Monthly analysis												
	All sample			US listings			UK listings			European listings		
	mean	<i>p</i>	N	mean	<i>p</i>	N	mean	<i>p</i>	N	mean	<i>p</i>	N
Financials	-0.009	0.50	95	-0.024	0.23	21	-0.059	0.40	17	-0.016	0.26	57
Healthcare	0.032	0.43	45	0.078**	0.05	30	-0.004	-	4	-0.084	0.52	11
Manufacturers	0.000	0.97	199	0.012	0.65	64	0.029	0.31	40	0.013	0.41	95
Nat. resources	0.059***	0.01	52	0.030	0.25	23	0.074	0.30	11	0.075***	0.00	18
Services	0.0285	0.32	48	-0.064	0.18	22	0.114	0.21	10	0.024	0.59	16
Technology	-0.034	0.19	58	-0.038	0.35	31	0.016	-	1	-0.006	0.89	26

Table VII. Multivariate Analysis of CARs around the Cross-listing Announcement

The table reports estimates of coefficients from cross-sectional regressions: $CAR_i = \alpha_i + \sum X_{ni} + \varepsilon_i$. The dependent variable in each regression is cumulative abnormal return for (-10, 10) days around cross-listing announcement. Explanatory variables (X_n) are defined in *Appendix 2*. The table also reports probability (p) of t -statistics on coefficient estimates calculated with heteroscedasticity and autocorrelation consistent standard errors (*Andrews (1991)*). Additionally the table reports for each regression: adjusted R^2 (*Adj.R2*), number of observations (N) and probability of F-test (*prob (F-test)*). ‘****’ indicates significant at 1%, ‘***’ indicates significant at 5% and ‘*’ indicates significant at 10%.

Variable	model 1		model 2		model 3	
	est.	p	est.	p	est.	p
Intercept	-0.012	0.25	0.032	0.28	-0.020	0.66
Host UK	0.012	0.42	0.014	0.37	0.014	0.38
Host US	0.044***	0.01	0.058***	0.00	0.040***	0.01
ln(MV)			-0.005	0.15	-0.004	0.29
PTB			0.000	0.97	0.000	0.87
afterSOX	-0.007	0.89	-0.060**	0.02	-0.057**	0.04
US OTC	-0.036*	0.07	-0.030	0.17	-0.033*	0.09
AIM	0.072*	0.06	0.052	0.27	0.051	0.30
Euro	0.011	0.56	0.009	0.70	-0.002	0.93
Cap. raising	0.013	0.53	-0.012	0.57	-0.018	0.38
First listing	0.015	0.19	0.006	0.61	0.004	0.71
Financials					0.032	0.41
Manufacturers					0.051	0.24
Healthcare					0.058	0.29
Services					0.042	0.30
Nat.resources					0.094**	0.03
Technology US					0.102*	0.10
Tech. Bubble					0.049*	0.10
<i>Adj.R2</i>	0.028		0.035		0.066	
<i>N</i>	254		214		214	
<i>prob (F-test)</i>	0.061	*	0.067	*	0.021	**

Table VIII. Multivariate Analysis of Monthly Excess Returns around the Cross-listing event

The table reports estimates of coefficients from cross-sectional regressions: $R_i - R_f = \alpha_i + \beta_{1i}(R_m - R_f) + \beta_{2i}SMB + \beta_{3i}HML + \sum X_{ni} + \varepsilon_i$. Explanatory variables (X_n) are defined in *Appendix 2*. The table also reports probability (p) of t -statistics on coefficient estimates calculated with heteroscedasticity and autocorrelation consistent standard errors (*Andrews (1991)*). Additionally the table reports for each regression: adjusted R^2 (*Adj.R2*), number of observations (N) and probability of F-test (*prob (F-test)*). ‘***’ indicates significant at 1%, ‘**’ indicates significant at 5% and ‘*’ indicates significant at 10%.

Variable	model 1		model 2		model 3	
	est.	p	est.	p	est.	p
Intercept	-0.004	0.72	0.010	0.87	-0.027	0.72
R(m)-R(rf)	1.113***	0.00	1.090***	0.00	1.078***	0.00
SMB	0.089	0.51	0.641***	0.00	0.611***	0.00
HML	-0.260	0.21	0.021	0.90	0.033	0.85
Host UK	0.003	0.90	0.009	0.79	0.004	0.92
Host US	0.016	0.45	-0.008	0.74	-0.012	0.61
ln(MV)			-0.002	0.71	-0.004	0.53
PTB			0.001	0.69	0.002	0.57
afterSOX	0.040	0.26	0.011	0.72	0.022	0.46
US OTC	-0.070**	0.05	-0.033	0.31	-0.033	0.31
AIM	0.110**	0.02	0.097	0.11	0.096	0.11
Euro	0.018	0.65	0.014	0.73	-0.006	0.89
Cap. raising	0.036	0.18	-0.004	0.90	-0.006	0.85
First listing	0.011	0.48	0.038*	0.06	0.034*	0.10
Financials					0.054	0.31
Manufacturers					0.040	0.43
Healthcare					0.060	0.36
Services					0.046	0.46
Nat.resources					0.106**	0.05
Technology US					0.009	0.90
Tech. Bubble					0.060	0.15
<i>Adj.R2</i>	<i>0.321</i>		<i>0.309</i>		<i>0.314</i>	
<i>N</i>	<i>497</i>		<i>352</i>		<i>352</i>	
<i>prob (F-test)</i>	<i><.0001</i>		<i><.0001</i>		<i><.0001</i>	

Monthly Risk Factors

The table reports descriptive statistics (monthly and annualized means and correlation) for market risk premium, HML and SMB (*Fama and French (1996)*) risk factors for eighteen European countries. The risk factors are calculated for all markets in the sample that contribute at least ten cross-listing events to the sample. Market risk premium is the market return over risk-free return; HML is the difference between MSCI Value and Growth country indices (in local currency); SMB is the difference between monthly value-weighted average returns of two portfolios ranked by size: bottom 50% 'small' and top 50% 'big'. The table also reports the first month for which the risk factors are calculated. The last month for all countries is December 2007.

Country	Period from	HML Mean		SMB Mean		Corr. (SMB & HML)	Market Risk Premium Mean	
		Monthly	Annual	Monthly	Annual		Monthly	Annual
Austria	Dec-98	0.007	8.40%	-0.001	-1.00%	-0.062	0.009	11.90%
Belgium	Jan-87	0.004	5.30%	0.001	0.60%	0.050	0.005	5.60%
Czech Republic	Jan-97	-0.006	-7.20%	-0.010	-11.20%	0.096	0.011	14.10%
Denmark	Jan-89	-0.003	-3.50%	-0.002	-2.70%	0.258	0.006	7.70%
Finland	Jan-94	-0.022	-23.70%	-0.008	-9.40%	0.769	0.011	14.50%
France	Jan-75	0.002	2.60%	0.002	2.10%	-0.02	0.005	6.60%
Germany	Jan-75	0.002	1.80%	-0.002	-2.10%	-0.055	0.005	6.70%
Hungary	Jan-97	0.002	2.40%	-0.005	-5.60%	-0.032	0.008	9.90%
Ireland	Jan-91	0.003	3.60%	0.000	0.10%	0.024	0.004	4.50%
Italy	Jan-87	0.001	1.50%	-0.003	-3.20%	0.072	0.000	0.20%
Netherlands	Jan-75	0.004	4.30%	0.000	-0.40%	0.036	0.008	10.20%
Norway	Jan-90	0.003	3.20%	-0.001	-1.00%	-0.06	0.003	3.10%
Poland	Jan-97	0.001	1.30%	0.004	5.40%	0.498	-0.001	-0.90%
Russia	Jan-97	0.002	2.00%	0.003	4.00%	-0.019	-0.003	-3.20%
Spain	Jan-90	0.004	5.00%	-0.002	-2.70%	-0.057	0.006	7.10%
Sweden	Jan-87	-0.002	-2.10%	-0.004	-4.10%	0.332	0.008	9.50%
Switzerland	Jan-84	0.001	1.30%	0.003	3.40%	-0.167	0.007	8.50%
UK	Jan-75	0.002	1.90%	0.000	0.50%	-0.014	0.006	7.90%
AVERAGE		0.001	0.80%	-0.001	-1.10%	0.079	0.006	6.90%

The risk factors, market risk premium, SMB and HML, are calculated for countries that contribute to the sample at least ten cross-listing events. *MSCI Market indices* (in local currency) return is used as a proxy for monthly market return for eighteen countries in the sample. Base rate, discount rate, deposit rate of central bank, or short-term T-bill rate is used as a proxy for risk-free return for each country in the sample. The data sources on risk-free return data include *Datastream*, *International Financial Statistics (IFS) database of International Monetary Fund*, and web-sites of central banks and *European Central Bank*.

SMB or Size risk factor (difference in value-weighted returns between small market cap stocks and large market cap stocks) is calculated for eighteen European countries (all countries in the sample excluding Greece and Luxembourg, for which MSCI style indices are not available for the period of time under investigation) using return and market capitalization data for all common stocks available in *Datastream* from non-financial industries for each market. I require availability of data for at least thirty securities for each market for each period of time. SMB is the difference between the monthly value-weighted (based on the market value at the end of December of the previous year) average returns of two portfolios ranked by size: bottom 50% 'small' and top 50% 'big'. The 50%/50% split is chosen in order to obtain longer time series of SMB. The classic 30%/30% approach would result in reduction in number of years for some markets due to unavailability of sufficient data for the risk factor calculation, because some of the European markets are rather small (have less than 100 companies listed) and additional requirement of data availability for at least thirty stocks in the market is imposed.

The proxy for **HML risk factor** (difference in value-weighted returns between value (high book-to-market ratio) stocks and growth (low book-to-market ratio) stocks) is constructed using style market indices (*MSCI Value and Growth indices* (in local currency)) for eighteen European countries in the sample (all countries in the sample excluding Greece and Luxembourg for which MSCI style indices are not available).

Determinants of the Valuation impact of international Cross-listing

The table provides the description of the explanatory variables employed in the multivariate analysis of excess returns around cross-listing announcement and around cross-listing date and their data sources.

Variable	Abbreviation	Description	Data source
Host UK	Host UK	dummy variable =1 if the cross-listing takes place in the UK; =0 otherwise	the sample
Host US	Host US	dummy variable =1 if the cross-listing takes place in the US; =0 otherwise	the sample
Company size	ln(MV)	=natural log of company's market capitalization (market value of common equity) prior to the cross-listing	<i>Datastream</i>
Company growth opportunities	PTB	price-to-book ratio (the share price divided by the book value per share) prior to the cross-listing	<i>Datastream</i>
US listing after SOX introduction	afterSOX	dummy variable =1 if the host market is the US and the listing that takes place in year 2002 or after; =0 otherwise	the sample
OTC trading prior to stock exchange listing	US OTC	dummy variable =1 if the listing takes place in the US and the company has OTC trading prior to the cross-listing; =0 otherwise	BNY and Citibank ADRs databases
Host market AIM	AIM	dummy variable =1 if the listing takes place in the UK on AIM of LSE; =0 otherwise	London Stock Exchange
Listing within the Eurozone	Euro	dummy variable =1 if the listing takes place within the Eurozone, i.e. both host and home markets are within the Eurozone after the Euro introduction; =0 otherwise	the sample
Capital raising activity on a foreign exchange	Cap. raising	dummy variable = 1 if the cross-listing involves issue of new equity; =0 otherwise	BNY and Citibank ADRs databases, <i>Thomson One Banker Equity Deals</i>
First foreign listing	First listing	dummy variable =1 if the listing is the first foreign listing by the company; =0 otherwise	the sample
Industry: financials, healthcare, services	Financials Healthcare Services	dummy variable =1 if the company belongs to industry Financials (Healthcare, Consumer Services) based on FTSE/DJ Industry Classification benchmark; =0 otherwise	<i>Datastream</i>
Industry: manufacturers	Manufactures	dummy variable =1 if the company belongs to one of the following industries: Basic Materials, Consumer Goods, or Industrials, based on FTSE/DJ Industry Classification benchmark; =0 otherwise	<i>Datastream</i>
Industry: natural resources	Nat. resources	dummy variable =1 if the company belongs to one of the following industries: Oil & Gas, or Utilities, based on FTSE/DJ Industry Classification benchmark; =0 otherwise	<i>Datastream</i>
Technology companies listing in the US	Technology US	dummy variable =1 if the company belongs to one of the following industries: Technology, or Telecommunications, based on FTSE/DJ Industry Classification benchmark, and cross-lists in the US; =0 otherwise	<i>Datastream</i>
Bullish period of technology bubble	Tech. Bubble	dummy variable =1 if the listing takes place during the period of time from Nov 1998 to Mar 2000; =0 otherwise	the sample

Multivariate Analysis of CARs around the cross-listing event

The table reports estimates of coefficients from cross-sectional regressions: $CAR_i = \alpha_i + \sum X_{ni} + \varepsilon_i$. The dependent variable in each regression is cumulative abnormal return for (-10, 10) days around the cross-listing event. Explanatory variables (X_n) are defined in *Appendix 2*. The table also reports probability (p) of t -statistics on coefficient estimates calculated with heteroscedasticity and autocorrelation consistent standard errors (*Andrews (1991)*). Additionally the table reports for each regression: adjusted R^2 (*Adj.R2*), number of observations (N) and probability of F-test (*prob (F-test)*). ‘***’ indicates significant at 1%, ‘**’ indicates significant at 5% and ‘*’ indicates significant at 10%.

Variable	model 1	
	est.	p
Intercept	-0.021	0.56
Host UK	0.002	0.86
Host US	0.003	0.83
ln(MV)	0.000	0.98
PTB	0.000	0.89
SOX	-0.040*	0.06
Euro	-0.022	0.19
Cap. raising	-0.033**	0.02
Financials	0.024	0.45
Manufactures	0.017	0.59
Healthcare	0.033	0.34
Services	0.022	0.52
Nat.resources	0.022	0.55
Technology US	0.059	0.15
Tech. Bubble	0.056***	0.01
<i>Adj.R2</i>	0.021	
<i>N</i>	408	
<i>prob (F-test)</i>	0.074	