Firms' Choices to Cross-list Stocks on the U.S. and the U.K. Markets: An Earnings Quality Perspective

by

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ABSTRACT

This thesis investigates some accounting issues that arise from firms' choices to cross-list stocks on the U.S. and the U.K. markets. Prior research shows that the benefits of cross-listing include a more liquid stock market, an increase in investor recognition, a decrease in the cost of capital, and a commitment to better corporate governance practices. However, the extent to which cross-listing can be used as an effective bonding mechanism is closely related to the choice of cross-listing destinations.

Specifically, I hypothesise that differences in firm characteristics, accounting standards setting procedures, and the legal and regulatory environments between the U.S. and the U.K. markets lead to the expectation that firms cross-listed in the U.S. markets have better earnings quality than firms cross-listed in the U.K. In the context of this thesis, earnings quality refers to how precisely reported earnings convey a firm's true economic performance, and it is measured by models of accruals, earnings persistence and predictability, smoothness, and target beating.

The results suggest the following. First, firms use accruals-based earnings management techniques to boost their earnings in the cross-listing year, but such

evidence is only observed for firms cross-listed on the U.K markets. A further examination shows that, for the U.K. sample, the extent of earnings management is influenced by whether a firm raises new equity capital at cross-listing, while no such evidence is found for the U.S. sample. Second, the results provide mixed evidence that cross-listing firms have higher earnings quality than their home country counterparts that are not cross-listed. For firms cross-listed in the U.S., the differences in earnings quality are greater in the post-SOX period. Third, this thesis directly compares firms that choose between different cross-listing destinations and finds that firms cross-listed in the U.S. have higher earnings quality than firms cross-listed in the U.K. Fourth, home-country institutions are found to have a significant influence on cross-listing firms' reporting behaviour.

The results are robust to controlling for innate factors known to affect the quality of earnings. Some interpretation issues arise when different measures of earnings quality are used, which shed light on future research directions.

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CHAPTER 1

INTRODUCTION

1.1 Purpose and Motivation of this Thesis

This thesis investigates some accounting issues that arise from firms' choices to cross-list stocks on the U.S. and the U.K. stock exchange markets. It uses the bonding hypothesis to posit that firms cross-listed on the U.S. markets have better earnings quality than firms cross-listed on the U.K. markets due to differences in firm characteristics, accounting standards setting procedures, and the legal and regulatory environments. In this thesis, four empirical studies are presented on how the choice between the U.S. and the U.K. as the cross-listing destination may be associated with different levels of earnings quality. Specifically, these four studies examine earnings quality of cross-listing firms (1) in the year of cross-listing vis-à-vis other years, (2) in comparison with non-cross-listing firms in their home countries, (3) in different host markets, and (4) from home countries with different institutions.[1]

The first motivation for this thesis is the lack of research evidence on cross-listing firms' accounting characteristics and earnings quality. Low earnings quality may be a function of a firm's environment, but it may also be the result of

[1] In this thesis, home country refers to the country in which a firm originates, and host country refers to the foreign country (i.e. the U.S. or the U.K.) that a firm chooses as the cross-listing destination.

earnings management, and the issue of earnings management per se has long concerned regulators and practitioners. The former U.S. Securities and Exchange Commission (SEC) Chairman, Arthur Levitt, in the speech delivered at New York University in 1998, comments that "We are witnessing an erosion in the quality of earnings, and therefore, the quality of financial reporting. Managing may be giving way to manipulation; Integrity may be losing out to illusion."[2] The same issue of earnings quality is highly relevant in the context of cross-listing. Sutton (1997) documents that the primary reason why the SEC had required cross-listing firms to either provide U.S. GAAP financial statements or reconciliations of net income and shareholders' equity to U.S. GAAP is in fact its concerns about financial reporting transparency of cross-listing firms.[3] Therefore, by looking into the earnings quality and earnings management issues confronting cross-listing firms, this thesis provides an accounting perspective to understand cross-listing activities.

The second motivation for this thesis arises from the debate on international financial centres. Since the mid-1980s, exchanges in the U.S. and the U.K. have been the most popular trade venues, attracting hundreds of firms every year to cross-list their stocks (Champagne and Kryzanowski 2009). After the passage of the

[2] From Levitt's (1998) speech "The numbers game", available at http://www.sec.gov/news/speech/speecharchive/1998/spch220.txt

[3] The SEC has passed new rules that exempt the reconciliation requirement for non-U.S. firms that prepare financial statements using the International Financial Reporting Standards (IFRS) as issued by the International Accounting Standards Board (IASB).

Sarbanes-Oxley (SOX) Act of 2002, many practitioners have expressed their concern that the U.S. market is losing its competitive edge since SOX has imposed significantly greater regulatory scrutiny on firms listed in the U.S. markets. If firms' choice of cross-listing destination is conceived as a careful evaluation of benefits and costs, the enactment of SOX can be an important factor that drives firms away when the direct and indirect costs of SOX are found to be unjustified for them. However, many accounting and legal researchers call for a better understanding of this phenomenon as some believe that the tightened reporting requirements in the U.S. is not the sole factor to blame (e.g. Prentice 2007; Pan 2006). The flip side to the argument of shifting in global financial centres could be that SOX successfully screens out low quality and less competitive foreign firms (Piotroski and Srinivasan 2008). A comparison of earnings quality between cross-listing firms in the U.S. and cross-listing firms in the U.K. could help us gain a deeper understanding of the financial centre debate.

The third motivation for this thesis is the desire to provide more solid evidence on the effectiveness of the legal bonding mechanism. Many have argued, starting with Stulz (1999) and Coffee (1999), that firms' decisions to opt into higher regulatory or disclosure standards largely stem from their commitment to better governance standards than those of their home countries. However, the operation of such bonding mechanisms is often more complex than it seems because cross-listing firms do not sever their legal ties with the institutional context in which they are originated. Skepticism grows among academics and practitioners on whether the bonding hypothesis provides a satisfactory explanation for the choice to cross-list (e.g. Licht 1998; Gozzi, Levine, and Schmukler 2008). This thesis addresses the issues related to bonding by assessing whether home-country institutions have impacts on earnings quality and earnings management behaviour of cross-listing firms

1.2 Specific Research Objectives

This thesis addresses four research objectives in each of the four empirical studies. First, I examine earnings quality around the time of the cross-listing event. This will enable me to examine earnings management issues. Using a U.S. sample from 1985 to 2003, Ndubizu (2007) finds some evidence suggesting that cross-listing firms manipulate earnings at the time of cross-listing after industry and performance are controlled for. I analyse whether this result is robust to controlling for other determinants of earnings management levels and whether this result is consistent across different cross-listing destinations.

Second, built on the empirical study of Lang, Raedy, and Yetman (2003a), I consider the potential difference in earnings quality between cross-listing firms and non-cross-listing firms in the home countries. Motivated by the debate on SOX's benefits and costs, a time dimension is added to the study by examining whether cross-listing firms' earnings quality changes before and after the enactment of SOX, which will also assist me in determining the presence of, or changes in, earnings management.

Third, I compare firms cross-listed in the U.S. and firms cross-listed in the U.K. in terms of their earnings quality and earnings management behaviour. As discussed above, two prevailing explanations to the increasing popularity of London's Main Market as the destination for cross-listing are (1) the increasing competitiveness of London and (2) the "screen out" effect in the aftermath of SOX. The comparison of earnings quality between firms cross-listed on the two markets provides important insights for understanding this trend.

Fourth, I explore possible impacts of home-country institutions on earnings quality of cross-listing firms. Strong enforcement and minority rights protection in host countries may not always be an effective replacement for strong investor protection in cross-listing firms' home countries (La Porta, Lopez-de-Silanes, Shleifer, and Vishny 2000). Therefore, direct empirical evidence is needed about whether and how the bonding mechanism works for firms domiciled in countries with different institutional characteristics.

1.3 Earnings Quality and Earnings Management

The title of this thesis refers to "earnings quality". In their review article, Dechow, Ge, and Schrand (2010, 344) define earnings quality as follows: "Higher quality earnings provide more information about the features of a firm's performance that are relevant to a specific decision made by a specific decision maker." To them earnings quality is therefore defined only in the context of a specific decision model. As this thesis is about aspects of a cross-listing decision, the relevant decision model is one centred on equity valuation. Secondly, they point out that many aspects of "performance" are not directly observable. And third, earnings quality is determined by the interaction of the relevance of the underlying financial performance and the ability of the accounting system to capture that.

In empirical financial accounting research, proxies for the notion of "earnings quality" are invoked. These include measurements of persistence, predictability, smoothness, timeliness, conservatism, and value relevance. These measurements will be affected not only by innate features of the firm, but by the way in which the accounting system produces the relevant metrics. And the accounting system, in turn, can be influenced by managerial actions.

We can consider the asset structure of the firm and the contractual relationships that the firm has with outside parties as "innate features". For example a company producing and selling electricity will in all likelihood have smoother (and more persistent and predictable) earnings and operating cash flow than a developing company in the biotech or information technology sectors. Francis, LaFond, Olsson, and Schipper (2004) identify the following proxies in their attempt to capture these features: firm size, cash flow variability, sales variability, operating cycle, intangible intensity, and capital intensity.

However, the earnings quality metrics can also be affected (a) by the way in which the accounting system records and reports earnings, and (b) by the way in which insiders determine how those numbers are reported. The former refers to features like “fair value” accounting, where changes in fair value are reported as part of earnings. Examples include changes in the value of investment properties held by retirement villages, changes in the value of biological assets, and changes in the value of (some) financial instruments. The latter refers to direct managerial actions either in the selection of accounting policies where choice is allowed, or direct managerial actions to satisfy some feature of “performance” that is seen to be desirable. These features might exist as a result of the contractual relationships that managers have with the firm (for example bonuses) or the firm has with other parties (for example debt contracts), or as a consequence of “market expectations” (for example analysts’ consensus earnings forecasts, or loss avoidance, or beating last year's earnings number).

In this thesis these insider actions are the focus of attention, as among other things my interest is to determine whether the earnings quality proxies that I use appear to have been influenced by them. I use the term "earnings management" to refer to this, and the definition of earnings management that I use (which is repeated in Section 2.6.1) is taken from Healy and Whalen (1999, 368). That definition is as follows: "Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company, or to influence contractual outcomes that depend on reported accounting numbers." Hence earnings management is about an action or choice, whereas proxies for earnings quality are about measurements.

Two points emerge. The first is that a measure like smoothness (as an example) can be affected by the innate features of the firm and by managerial actions which are described as earnings management. The second is that some metrics that are used in the literature are direct attempts to examine questions of earnings management. Examples that fall under this heading are loss avoidance (by reporting (small) profits), target beating, and discretionary accruals. Dechow et al. (2010, 345) subsume the issues that I am interested in under the heading “Category 1” and state that this “includes earnings persistence and accruals; earnings smoothness; asymmetric timeliness and timely loss recognition; *and target beating, in which the distance from target (e.g., small profits) is viewed as an indication of earnings management, and earnings management is assumed to erode earnings quality*” (emphasis added). They go on to state: “The literature often inadequately distinguishes the impact of fundamental performance on EQ from the impact of the measurement system. We can cite only a few papers to support this observation, which underscores our point that we need *more* research on this topic” (2010, 345, emphasis in original).

The particular focus of the thesis is on whether (more or less) earnings management exists when I compare cross-listing companies with some other set of companies, or cross-listing companies at different points in time (for example, before and after the implementation of the SOX legislation), or cross-listing companies seeking listing in different markets. But I can only infer earnings management (EM) from the proxies for earnings quality (EQ) that I use, having controlled for the innate features of the firm where this is appropriate.

Because the focus of the thesis is attempting to infer earnings management, the dependent variable is typically coded as EM. The terms earnings quality and earnings management are used throughout this thesis, with the meanings ascribed to them in this section.

1.4 Summary of Findings

The field of cross-listing has attracted considerable attention, primarily because of the increasing incidence of cross-listing in the past few decades. The integration of international capital markets since the late twentieth century has accelerated flows of capital between different countries and has substantially facilitated cross-border capital raising activities. There is a widely held belief in the prior literature that cross-listing is beneficial provided that it is endorsed by host country regulators that require strict adherence to host country regulations and enforcement. In a review article of global cross-listing activities in the past two decades, Karolyi (2006) provides an extensive discussion of the benefits of cross-listing from a finance perspective. The benefits of cross-listing include: (1) a strategic vehicle for firms to reduce the cost of capital by listing on a more efficient market (i.e. the market segmentation hypothesis), (2) an effective mechanism to facilitate cross-border capital flows and a more liquid market for foreign public companies (i.e. the liquidity hypothesis), (3) an increase in investors' recognition of a firm and a firm's prestige (i.e. the awareness hypothesis), and (4) the potential to serve as a bonding mechanism to improve corporate governance (i.e. the bonding hypothesis). Left relatively unexplored is the accounting implication of cross-listing choices, especially the differential host country impacts on firms that choose to cross-list onto different stock exchange markets.

Using Compustat data from 1989 to 2011, samples of cross-listing firms are constructed for the U.S. and the U.K. markets respectively. The EM measures used in this thesis are from Dechow et al.'s (2010) first category of earnings quality proxies, including models of accruals, persistence and predictability, smoothness, and target beating.

In the first study, I examine evidence of earnings management in the year of cross-listing. The results from the U.S. sample provide no evidence in support of the argument that cross-listing firms manage earnings upwards in the year of cross-listing. For the U.K. sample (in comparison with the U.S. sample), the difference in earnings management, as indicated by discretionary accruals and percent operating accruals, between firms in the year of cross-listing and firms in other years is more profound. A further breakdown of firms shows that, for the U.K. sample, IPO firms and non-IPO firms engage in different levels of earnings management in the year of cross-listing, while no such evidence is found for the U.S. sample.

With respect to the second study, the results provide mixed support to the argument that firms that cross-list their stocks in the U.S. have better earnings quality than the home-country firms that are not cross-listed. This difference is greater in the post-SOX period, suggesting a positive SOX impact on the quality of earnings for firms cross-listed in the U.S. Some differences in earnings quality between cross-listing firms and home country firms are observed for the U.K. markets, which are often considered to have less stringent reporting requirements and regulatory environments.

In the third study, I compare firms cross-listed in the U.S. to firms cross-listed in the U.K. using Heckman's two-stage procedure to control for selection bias. In the first stage, I estimate a choice model to explain firms' overall decisions to cross-list onto the U.S. or the U.K. markets. The cross-listing preference is found to be influenced by firm-level growth opportunities and country-level incentives such as economic proximity, economic development, and GAAP differences. These firm characteristics and country-level determinants of firms' cross-listing choice are controlled for in the second stage. The results indicate that firms cross-listed in the U.S. have higher earnings quality than firms cross-listed in the U.K. Firms cross-listed in the U.S. and U.K. markets differ significantly in their general propensity to manage earnings, although the evidence does not extend to income-increasing discretionary accruals.

The fourth study examines the impact of home-country institutions on cross-listing firms' earnings quality. Based on the work of La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998), institutions are measured across five dimensions: (1) legal origin, (2) legal tradition, (3) outside investor rights, (4) legal enforcement, and (5) ownership concentration. I find that legal tradition, legal enforcement, and ownership concentration appear to exhibit some explanatory power for earnings quality for firms cross-listed in the U.S. markets. Legal tradition, outside investor rights and ownership concentration have significant associations with some of the earnings quality measures for firms cross-listed in the U.K. markets, but the statistical significance is lower.

Overall, the findings of the four studies provide consistent evidence in support of the differential host-country impacts. First, firms appear to engage in more aggressive earnings management in the year of cross-listing when their foreign destination is the U.K. markets instead of the U.S. markets.[4] Second, for the U.K. sample, the difference in earnings quality between cross-listing firms and home country firms is not as significant as that for the U.S. sample. Third, a direct comparison also shows that firms cross-listed in the U.S. have higher earnings quality than firms cross-listed in the U.K. Finally, the bonding effect is stronger in the U.S. markets as indicated by

[4] This thesis does not attempt to define "aggressive earnings management" in technical terms. Whenever mentioned in this paper, it refers to the literal meaning of "more" or "less" aggressiveness.

the strength of association between earnings quality and institutions.

1.5 Contributions of the Research

This thesis contributes to both the earnings quality literature and the cross-listing literature by providing evidence consistent with firms committing to improve information disclosure and to reduce earnings management following a cross-listing on a stringent market. While there is a substantial body of literature on cross-listing in general and earnings management in general, there is a lack of research evidence on cross-listing firms' accounting characteristics and earnings management behaviour. In other words, the relationship between firms' cross-listing choices and their earnings quality remains largely unclear.

Meanwhile, the U.S. SEC appears to have taken a major step towards a less stringent approach by relaxing some of the rigours of the registration (deregistration) requirements and reporting standards for foreign issuers. This regulatory change has been controversial (Frost, Henry, and Lin 2009; Kang, Krishnan, Wolfe, and Yi 2012), and some call it a "race to the bottom" where firms choose to cross-list in more lenient regulatory regimes and regulators are pressured to relax their own securities' regulations (Langevoort 2008; Gadinis 2008). To address such concerns, it is important to understand why foreign firms choose a particular host market and whether stringent regulatory environments do translate into high quality of earnings.

The second contribution of this thesis to the accounting literature is the approach taken to improve our understanding of cross-listing choices. This thesis is among the first studies to compare firms cross-listed in the U.S. and the U.K. in terms of their earnings management behaviour. Many cross-listing studies take the view that the decision to cross-list results from *ex ante* efficiency considerations and is an indication of the cross-listing firm's commitment to improve information disclosure and governance practices. These studies tend to omit *ex post* opportunism that, though not directly observable, may be influenced by the institutional characteristics of the host market. For the past few decades, the New York Stock Exchange (NYSE), NASDAQ, and the London Stock Exchange (LSE) were undoubtedly three of the most popular destination markets for cross-listing. Therefore, the comparison of earnings quality between firms cross-listed in the U.S. and the U.K. extends the literature by suggesting that the home country and the host country both play important roles in influencing managers' *ex post* opportunism and thereby the cross-listing firms' quality of earnings.

1.6 Organisation of the Thesis

The remainder of the thesis is structured as follows. Chapter 2 provides a review of the literature on cross-listing. This chapter introduces the evolution of the concept of cross-listing, costs and benefits of cross-listing for foreign firms, regulations and reporting requirements of cross-listing, and cross-listing firms' incentives for earnings management. Chapter 3 develops hypotheses regarding the earnings quality issues raised in the literature review. The hypotheses are concerned with *when, where, how,* and *why* cross-listing firms manage their earnings, which corresponds with the four research objectives outlined in Section 1.2. In Chapter 4, the research designs and models used to test the hypotheses are described. Chapter 5 presents sample construction and data sources used for the empirical tests, including key data issues that arise from the sample collection procedures. Chapter 6 discusses the results of testing the four hypotheses, which include both univariate and multivariate data analyses. Finally, Chapter 7 summarises and concludes the thesis, including comments on future research directions.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The recent decades have seen an increasing amount of literature investigating the impact of cross-listing and depositary receipt programs (DRs) on individual investors, foreign issuers, and the stock markets that absorb the overseas supply of shares. This chapter conducts a comprehensive review of the literature on cross-listings.

It begins with an investigation of the evolution of cross-listings and DRs in Section 2.2. Based on the prevailing trends and motivations of firms' participation in international stock markets, Section 2.3 defines cross-listings in a contemporary context. Section 2.4 explains possible reasons for firms to cross-list their shares by elaborating on the alternative hypotheses proposed by prior studies. In Section 2.5, the legal institutions and regulations governing the U.S. and the U.K. cross-listings are compared and contrasted. This is followed by a discussion on cross-listing firms' incentives for earnings management in Section 2.6. Section 2.7 provides a summary of this chapter.

2.2 The Evolution of Cross-listings and DRs

2.2.1 Overview of the Cross-border Listing Destinations

Cross-listing by foreign issuers can be traced back to December 20, 1928, when Inco Limited, a nickel producer from Canada was listed on the NYSE (Pederson 2002).[5] At that time, Inco Limited operated Canada's largest mining and processing operation in Sudbury, Ontario, which was the world's largest nickel deposit ever discovered. Despite the economical process devised by Inco Limited to refine nickel, the U.S. steel industry did not accept the fact that it had to rely on a single Canadian source for producing steel made from the iron-nickel alloy. However, Inco Limited did not give up on its initial effort to enter the U.S. steel market. Using the financial backing of J.P. Morgan, it strategically merged with a number of U.S. and Canadian steel producers and cross-listed onto the NYSE in order to make itself more appealing to the U.S. markets. By the late 1920s, Inco Limited was able to control over 70 percent of the U.S. nickel market. This very first cross-listing event suggests that cross-listing of stocks enables the foreign issuer to gain investor and host-country market recognition that it may find difficult to establish in the home-country stock exchange.

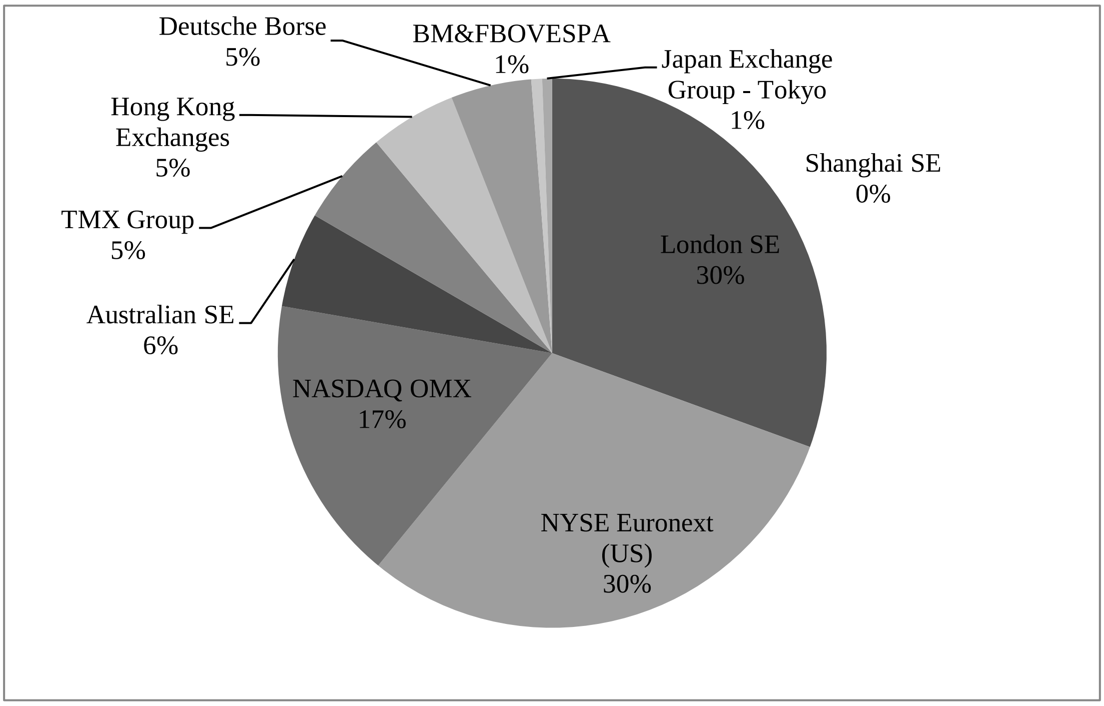
In fact, Inco Limited was not alone in recognising the strategic benefits of

[5] The listing history of Inco Limited is found in the International Directory of Company Histories, vol. 45, pp. 195-200.

cross-listing and deciding to cross-list ordinary shares onto major stock exchanges. At the end of 1975, 37 foreign companies were cross-listed on the NYSE (World Federation of Exchanges 2012).[6] By year-end 2012, the number of cross-listing firms on the NYSE and NASDAQ were 524 and 290 respectively.[7]

Figure 2.1

The 2012 Distribution of Foreign Listings among Top 10 Stock Exchanges in the World



Data source: World Federation of Exchanges (2012)

[6] The World Federation of Exchanges (WFE) is a trade association of major publicly regulated stock, futures, and options exchanges

[7] The WFE provides listing information across various exchanges up to and including 2012.

Figure 2.1 shows the distribution of foreign listings among the world's largest stock exchanges measured by market capitalisation.[8] The 2012 distribution shows that the London Stock Exchange and the NYSE each accounts for 30% of the total foreign listings on the Top 10 stock exchanges. This is followed by NASDAQ, which attracts a significant number of foreign issuers to cross-list their shares on the U.S. markets. It is important to note that the top three cross-listing destinations together account for more than 70 percent of the cross-listings – a situation that closely resembles an oligopolistic market for foreign issuers. On one side, this oligopoly-like distribution of foreign listings indicates the high popularity and prestigious positions of the U.S. and the U.K. stock exchange markets for foreign firms. On the other side, this uneven distribution also suggests that other prominent stock exchange markets such as the Asia-based Tokyo Stock Exchange and Shanghai Stock Exchange may not create comparable value as the U.S. and the U.K. stock exchange markets for cross-listing firms.

In fact, the U.S. stock exchange markets became the dominant cross-listing destinations in the 1990s and 2000s. During earlier time periods, the waves of foreign listings flowed to a variety of different countries (Sarkissian and Schill 2012). For

[8] The ten largest stock exchanges are based on their 2011 market capitalisation. The top ten exchanges (from highest to lowest) are: (1) New York Stock Exchange, (2) NASDAQ OMX, (3) Tokyo Stock Exchange, (4) London Stock Exchange, (5) Shanghai Stock Exchange, (6) Hong Kong Stock Exchange, (7) Toronto Stock Exchange, (8) BM&FBovespa, (9) Australian Securities Exchange, and (10) Deutsche Börse.

example, France was an attractive cross-listing destination in the 1960s after its market liberalisation and outstanding economic growth. In the 1970s, a wave of cross-listings went to the Tokyo Stock Exchange after it initially opened its Foreign Stock Section in 1973. It appears that firms' cross-listing decisions are substantially influenced by the perceived benefits of the cross-listing destinations. Therefore, it is important to examine why certain cross-listing destinations are attractive and others are not.[9]

2.2.2 The Top Three Cross-listing Destinations

For the first decade of the twenty-first century, the NYSE, NASDAQ, and the London Stock Exchange were undoubtedly three of the most popular destination markets for cross-listing. Figure 2.2 shows the number of foreign listings on the top three cross-listing destinations from 1991 to 2012.[10]

As documented by Eun and Sabherwal (2003), attracting non-U.S. listings has been a top priority of the U.S. stock exchanges in the 1990s. This was a critical decade for the growth of the U.S. cross-listing market as firms cross-listed during this period were from a wide variety of countries including the emerging markets and

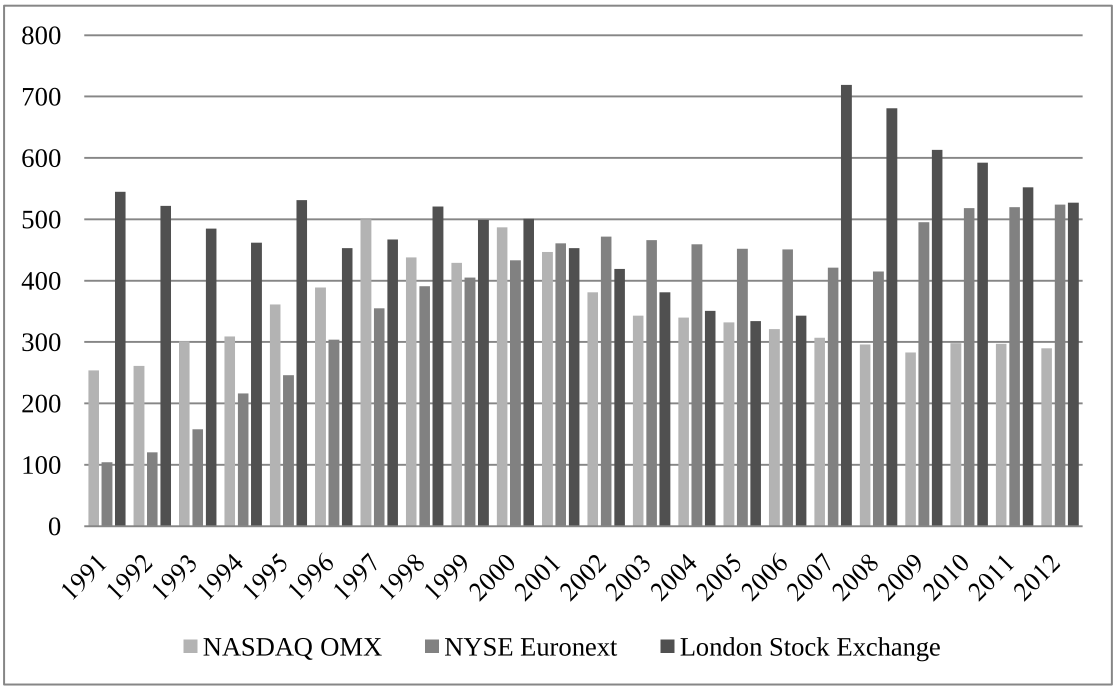
[9] For the purpose of this thesis, the discussion focuses on the recent phenomenon of the domination of the U.S. and the U.K. stock exchanges for cross-listings.

[10] The WFE defines a foreign listed company as a company whose country of incorporation is different from the country where the exchange is located. If a company has multiple classes of shares, this company is only counted once.

developing countries. Prior to this fast-growing period, most of the foreign listings in the U.S. originated from Canada, U.K., and Israel, while a significant number of U.S. firms also chose to cross-list in Japan.[11] Between 1991 and 2000, the number of cross-listing firms on the NYSE and NASDAQ increased by 316% and 92% respectively. This drastic boom of the U.S. stock exchange markets overturned the position of the U.S. from the largest provider of foreign shares to the largest recipient of foreign shares (Sarkissian and Schill 2012).

Figure 2.2

Number of Foreign Listings on the NYSE, NASDAQ, and LSE



Data source: World Federation of Exchanges (2012)

[11] Sarkissian and Schill (2012) note that the U.S. and Israel have similar institutional settings and a common clearing system in the 1980s, which provides a strong motivation for Israeli companies to cross-list on the U.S. stock markets.

To the surprise of many, the domination of the U.S. as a cross-border listing destination is a more recent phenomenon. In the early 1990s, the number of foreign listings on the London Stock Exchange was more than the sum of foreign listings on the NYSE and NASDAQ.[12] As one of the world's oldest stock exchanges, the London Stock Exchange was formerly known as The International Stock Exchange of the United Kingdom and the Republic of Ireland. Since its establishment in the 17th century, the London Stock Exchange quickly grew to become one of the most important financial institutions in Europe. Licht (1998) argues that the modern history of European stock exchanges in fact begins in 1986, when a sweeping reform was undertaken by the British government to deregulate the financial markets. Major changes as a result of the deregulation included the abolition of minimum scales of commission, allowance of competition from outside corporations such as banks and foreign institutions, and the removal of the broker/dealer distinction (London Stock Exchange 2013a). This deregulation led to a revolution in the European stock markets and consolidated the position of the London Stock Exchange as one of the leading stock exchanges in the increasingly internationalised stock exchange markets (Licht 1998).

[12] Doidge, Karolyi, and Stulz (2009a) note that the foreign listing counts cannot be used to make direct inferences about the relative attractiveness of the U.S. and the U.K. markets because the aggregate data provided by WFE do not give detailed information about the type of listings and the characteristics of listed firms.

Another significant change to the structure of the London Stock Exchange was the launch of the Alternative Investment Market (AIM) in June 1995 for growing companies worldwide. As an impressive attempt of the London Stock Exchange to attract smaller companies, the number of foreign listings on the AIM has increased from only 3 in the launch year to 226 by the end of 2012.[13] It is also important to note that the number of cross-listing firms on the AIM peaked in 2007 when the 1694 companies listed on the AIM consisted of 347 (i.e. 20.5%) cross-listing firms (London Stock Exchange 2013b). In fact, the boosted popularity of the AIM in 2007 coincided with the increased market share of foreign listings on the London Stock Exchange as a whole. As shown in Figure 2.2, the number of foreign listings on the London Stock Exchange in 2007 had more than doubled in a year while the number of foreign listings on the NYSE and NASDAQ had steadily shrunk from 2002 to 2007. In parallel with this trend, the U.S. market has reported 726 delisting cases from 1990 to 2005 as compared to 317 total delistings from the U.K. market during the same period (Doidge et al. 2009a).[14]

[13] The AIM is a renewed attempt of the London Stock Exchange to build a stock market for small, growing firms. Prior to the launch of the AIM, a previous attempt has been made by the London Stock Exchange to establish the "Third Market" to combat the emergence of the NASDAQ. However, the Third Market only attracted 92 companies before the London Stock Exchange decided to close down this thinly traded smaller-companies market (Posner 2009).

[14] Doidge et al.'s (2009a) study classifies delistings into three groups: voluntary, merger/acquisition, and other. They argue that the U.S. market has not become less competitive than the U.K. market for foreign companies because voluntary delistings as a proportion of total delistings is higher in the U.K. market than in the U.S. market. Although Figure 2.2 indicates a substantial growth in the number of foreign companies on the London Stock Exchange, a significant proportion of the growth originated

2.3 Defining Cross-listing in a Contemporary Context

While the development of a country's financial sector is positively associated with the growth of the country's stock exchange markets, the development of the financial sector in different countries did not change monotonically over time (Rajan and Zingales 2003). The observed change in the pattern of cross-listing activities in terms of destination choices and the characteristics of cross-listing firms reflect on the state of financial development in the cross-listing destinations as compared to the state of financial development in the cross-listing firms' home countries. Sarkissian and Schill (2012) point out that firms' choice of cross-listing destination is also a good indicator of the relative attractiveness of the international financial markets that compete with one another to attract foreign issuers.

As indicated by the current trend of cross-listing activities, the migration of stock exchange activities abroad has been observed in many countries around the world, but some countries appear to be more popular than others as the destinations for foreign firms. According to Adler and Dumas (1983), this pattern largely mirrors the segmentation of financial markets, which distinguishes between the level of benefits offered by listings on the domestic markets and those offered by listings on international markets. In a completely integrated financial market, a firm would not

from the spectacular growth of the AIM.

expect to see a significant impact of the cross-listing event on its share prices. However, Alexander, Eun, and Janakiramanan (1988) report that the international listing of a security is accompanied by a reduction in its expected return. This finding is consistent with the segmentation hypothesis, which suggests that the international financial markets are at least “mildly” segmented (Alexander et al. 1988, 136).

In general, firms’ shares tend to migrate out of the emerging markets or the developing countries, and flow into more popular and well-developed stock exchange markets in the developed countries. Many firms that originate from the emerging markets have evolved and grown into international firms with a strong physical presence in overseas markets. Hence, the migration view argues that the internationalisation of firms’ operations in the increasingly globalised business environment is likely to induce a shift in the share listings and trading of these international firms out of their domestic markets and into major international financial centres such as New York and London (Levine and Schmukler 2007). Compared with domestic markets, leading international financial markets provide immediate benefits to issuers such as lower information and transaction costs (Lang, Lins, and Miller 2003b).

Based on the prevailing trends and motivations of firms’ participation in international stock markets, this thesis defines a cross-listing activity as below.

Cross listing of stocks is when firms list their equity shares on one (or more) foreign stock exchange(s) to seek benefits that could not be gained in their home-country stock exchange markets.

By this definition of cross-listing, a cross-listing activity is related to at least two stock exchange markets. The first market is the home market of the cross-listing firm, which is the domestic market where the firm is based and is usually where the firm was first listed. The second market is the host market of the cross-listing firm, which is the financial market that the firm chooses to cross-list their shares on. The definition recognises the fact that many firms nowadays choose to list their shares in more than two countries, and it also includes different types of cross-listings such as direct international listing and dual international listing using depository receipts.

Studies prior to the 1990s primarily investigate cross-listing firms that change the listing market from their domestic ones to the international ones. Ying, Lewellen, Schlarbaum, and Lease (1977), for example, document a significant association between a cross-listing on one of two major American stock exchanges and abnormal positive investment returns on the shares of the cross-listing firm. The cross-listing firms that these authors investigate are those companies whose common shares were listed for the first time on either of the stock exchanges.[15]

[15] In this study, the two major American stock exchanges are the NYSE and the American Stock

As dual listings become more common, studies are also extended to examine the impact of international dual listings on cross-listing firms. International dual listing is often regarded as a special type of dual listing, which refers to a situation in which the shares of a firm that are listed on a home market in the domestic country also become listed on a host market in the foreign country (Alexander et al. 1988). This international dual listing process is typically made through the DRs trading mechanism that was first introduced by J.P. Morgan in 1927. In particular the DRs represent shares held in custody in the cross-listing firms' home market while the trading activities such as paying dividends and buying and selling of shares are conducted in accordance with the practices and regulations established in the host country. This mechanism is important for investors who want to gain exposure to foreign companies but are limited by the stock market regulations in different countries. In fact, the first depository receipt created by J.P. Morgan was an active response to the U.K. law that required U.K. companies to have a British-based transfer agent in order to register shares overseas (J.P. Morgan 2007).[16] The creation of DRs thus allows cross-listing firms and investors to overcome the awkward settlement procedures. To date, over 2,100 issuers from more than 80 markets have sponsored DR programs (J.P. Morgan 2013). Foreign companies' access to the U.S.

Exchange (AMEX).

[16] The first depository receipt was for the U.K. retailer, Selfridges Provincial Stores Limited.

capital market is provided by the American Depositary Receipt programs (ADRs), while the exposure to the global markets such as the U.K. is provided by the Global Depositary Receipt programs (GDRs).

2.4 Why Do Firms Cross-list?

There has long prevailed a belief by investors that the increasing globalisation of the financial markets provides a unique opportunity for diversifying risks associated with investment in the domestic financial market. Left relatively undetermined is the explanation for firms' decision to cross-list in a foreign market. Karolyi (2006) reviews global cross-listing activities in the past two decades and provides an extensive discussion of the benefits and costs of cross-listing. As stated in Section 1.4, the widely recognised benefits of cross-listing include: (1) a strategic vehicle for firms to reduce their cost of capital by listing on a more efficient market (i.e. the market segmentation hypothesis), (2) an effective mechanism to facilitate cross-border capital flows and a more liquid market for foreign public companies (i.e. the liquidity hypothesis), (3) an increase in investors' recognition of a firm and a firm's prestige (i.e. Merton's (1987) awareness hypothesis), and (4) the potential to serve as a bonding mechanism to improve corporate governance (i.e. the bonding hypothesis). In the following sections, these four hypotheses are discussed in detail.

2.4.1 Market Segmentation Hypothesis

In the 1970s and 1980s, a growing finance literature examined the issue of capital market integration-segmentation as empirical evidence in this area can provide important insights into cross-listing activities (Adler and Dumas 1983). The general idea of the segmentation theory is that investors who confront barriers to international investment cannot construct an efficient world market portfolio and they tend to hold few foreign securities (Stulz 1981). The segmented capital market provides incentives for firms to cross-list their shares as cross-listings can overcome many of the investment barriers and reduce firms' cost of equity capital.

The segmentation hypothesis asserts that firms' decision to cross-list on a foreign stock exchange is rationalised by the existence of market segmentation that arises from a variety of sources. First, there are direct barriers in the form of regulatory restrictions and taxes. Ownership restrictions are the most common type of regulatory restriction, which specify that only a certain group of investors can invest in certain types of securities. Adler and Dumas (1983) consider two extreme cases as the starting point to think about the impact of ownership restriction. The first case is a perfectly integrated world market where investors can freely choose the market that they want to invest in. In this "perfect" world, the Modigliani–Miller propositions all hold.[17] And corporate hedging of the exchange rate risk is irrelevant.[18] The opposite case is complete market segmentation where investors from one country are prohibited from investing in another country. Stapleton and Subrahmanyam (1977) compare and contrast these two scenarios and report that the main effect of segmenting capital markets is depressed share prices. This creates an incentive for firms to increase the diversification opportunities available to investors via cross-listing, which can circumvent market segmentation, lower the cost of capital, and increase firm values. Consistent with this argument, standard international capital asset pricing models also predict a negative association between the degree of stock market liberalisation and the liberalising country's cost of equity capital (Henry 2000).

Tax barriers also exist as differential personal tax rates and the taxes on holding foreign assets affect the international capital market equilibrium and create the possibility of expropriation of foreign holdings. The barrier created by discriminatory taxation is reflected in the optimal portfolio constructed by Black (1974), in which the proportion of domestic assets is much higher than the proportion of foreign assets. In comparison, if an investor does not need to take taxes into account, the optimal tax

[17] See Modigliani and Miller (1958) and Modigliani and Miller (1963)

[18] Adler and Dumas (1983) point out that the exchange rate risk per se is not a source of market segmentation as it can be controlled by proper hedging.

free portfolio holds assets anywhere in the world as predicted by the world capital asset pricing model.

Second, market segmentation also arises from indirect barriers such as information asymmetry, differences in accounting standards, and liquidity risks (Miller 1999). Investors tend to discount share prices for firms that list their shares in relatively opaque markets. For example, using a sample period from 1994 to 1996, Chakravarty, Sarkar, and Wu (1998) document an average discount of approximately 60% of the price of Chinese foreign Class B shares to the price of Chinese domestic Class A shares.[19] The segmentation theory suggests that the lack of information is a significant barrier that discourages foreign investors from investing in Chinese shares. The fate of the Class B shares would be dramatically different if these companies choose to cross-list their shares on a more transparent and reliable stock exchange market.[20] Using firm data over the period of 1985 through 1995, Miller (1999) tests the existence of two indirect barriers – investor recognition and liquidity risks. In particular, he uses the DR programs as the proxy for these two barriers and finds that the stock price reaction is strongly associated with the choice of stock exchanges. On

[19] Chinese Class A shares are the mainstream shares listed on either the Shanghai or the Shenzhen stock exchanges in China. As required by the Chinese listing rules, only companies incorporated in mainland China are entitled to list their shares as A Shares in the local Chinese currency, renminbi. Chinese Class B shares contain Chinese companies who want to raise capital from overseas as foreign investors can invest in Class B market with much less restrictions than with the Class A shares.

[20] Using hypothetical models, Chakravarty et al. (1998) show that the liquidity of Class B shares improves dramatically if a Class A share index becomes tradable by foreigners.

average, firms domiciled in emerging markets experience larger abnormal returns than firms located in developed markets, which is consistent with the observed trend of stock exchange migration from emerging markets to developed markets.

The most important implication of market segmentation on firms' cross-listing decisions is the potential impacts on the cost of capital and thus firm values. In operational terms, market segmentation is evidenced by the fact that market risk is priced differently in different capital markets. This in turn affects firms' cost of equity capital and hence provides firms with incentives to alleviate the negative effects of investment barriers through corporate-level decisions such as cross-border mergers or cross-listing of shares. Therefore, the international market segmentation hypothesis would argue that a firm's decision to cross-list shares can result in a reduction in its cost of capital if the firm's home market is partially or completely segmented.

2.4.2 The Liquidity Hypothesis

The liquidity hypothesis was developed by Amihud and Mendelson (1986), who argued that the expected return of a security is an increasing and concave function of the spread.[21] In their study, Amihud and Mendelson (1986) model the liquidity hypothesis in the context of an equilibrium asset pricing model where the gross

[21] Amihud and Mendelson (1986) use the bid-ask spread to proxy for liquidity.

required rate of return by investors is the sum of the spread-adjusted return and the expected liquidation cost. As firms list on a stock exchange market with high marketability and low trading costs, spreads drop and the lowered required rate of return is expected to lead to an increase in share value. Clearly, the liquidity hypothesis is based on the premise that some capital markets have better liquidity and there is a liquidity premium for firms that list on these markets.

In practice, liquidity is among the primary attributes of securities that portfolio managers consider since the investment horizon varies across different groups of investors. Fanto and Karmel (1997) conduct an opinion survey of non-U.S. corporate financial officers and investigate these officers' attitudes towards a U.S. listing. The results suggest that the liquidity of the U.S. stock exchange markets is an important reason for foreign firms to go for a U.S. listing.[22]

Due to the difficulties of collecting data on bid-ask spreads in foreign markets, earlier studies focus on the liquidity impact of U.S. firms when they switch from a relatively small market to a relatively large domestic market (e.g. a NASDAQ firm decides to list on the NYSE). Kadlec and McConnell (1994) find that NASDAQ stocks in the 1980s earn an average abnormal return of 5% after their announcement

[22] Liquidity is one of the reasons that encourage a U.S. listing. Finance officers in the survey also cite other reasons such as U.S. acquisitions and industry-specific reasons (e.g. a trend for a particular industry to list on the U.S. markets).

of the NYSE listing. They argue that this increase in share price is explained by their joint test of Merton's investor recognition factor and Amihud and Mendelson's (1986) liquidity factor. However, when the liquidity hypothesis is tested in the context of cross-listing firms by Foerster and Karolyi (1999), the test results are inconsistent with the liquidity hypothesis.[23] Also in Berkman and Nguyen's (2010) study, cross-listing firms do not demonstrate improvement in liquidity after controlling for contemporaneous changes in liquidity for a matched sample of non-cross listing firms.

2.4.3 The Awareness Hypothesis

The common approaches to estimate cost of capital are usually based on the assumption of frictionless markets and complete information. Theoretical models such as the capital asset pricing model (CAPM) assume that investors are rational and trade without transaction costs, which often fails to reflect the complex reality of trading activities in stock markets (Mullins 1982).[24]

Merton (1987) proposes the awareness hypothesis, suggesting that variation in the levels of investor recognition of a firm's securities can influence stock prices. In

[23] Foerster and Karolyi (1999) also test the market segmentation hypothesis which suggests a higher equilibrium share price and a lower expected return when shares are cross-listed on two segmented markets. The results do not provide support for the segmentation hypothesis

[24] In statistical tests of market efficiency, rational investors are assumed to have known the theoretical valuation models and how these models can be applied to identify under- or over-priced stocks.

reality, investors have incomplete information, and each investor only knows a subset of the available stocks. The lack of information about stocks outside of the awareness subset causes investors to be concerned about these stocks. For this reason, some relatively small firms attract no institutional investors or informed traders at all. To correct for information asymmetry, firms regularly incur considerable costs as expected by the signalling models and agency theory. However, Merton (1987, 489) suggests that there is another type of "set-up" cost that determines the costs of information asymmetry after the firm is listed on a particular market. This set-up cost is the cost of making investors aware of the firm and encouraging investors to follow the firm in their subsets of traded securities. Without the premise of investor awareness, the subsequent costs incurred by a firm on transmitting information to investors would not have any practical effects as new or unaware investors would not pay attention to the information released by the firm. To account for the effect of investor recognition, Merton (1987) extends the CAPM and demonstrates that expected returns decrease with the degree of investor recognition measured by the size of the firm's investor base.

For foreign firms, the opportunities to increase investors' awareness provide strong incentives for cross-listing their shares on some of the largest and most renowned stock exchange markets. From the behavioural finance perspective, the awareness hypothesis also predicts that firms usually experience an increase in share price when they cross-list on prestigious stock exchange markets such as the NYSE and the NASDAQ market because of the greater investor recognition. Lehavy and Sloan (2008) lend support to the awareness hypothesis by documenting a positive association between investor recognition and contemporaneous stock returns. As indicated above, Merton's awareness hypothesis and the liquidity hypothesis are jointly tested by Foerster and Karolyi (1999), and the results are in favour of the awareness hypothesis as the impact of changes in the shareholder base around cross-listing events is significant. The increase in awareness is also significant when a foreign firm chooses to cross-list on the London Stock Exchange. Baker, Nofsinger, and Weaver (2002) find that cross-listing firms experience a significant increase in visibility and a decrease in cost of equity capital when they list on the NYSE or the London Stock Exchange.[25] This effect is stronger for the NYSE listings than for the London Stock Exchange listings, which justifies the higher listing costs associated with the NYSE listings.

2.4.4 The Bonding Hypothesis

A significant benefit of cross-listing relates to the bonding hypothesis proposed

[25] It should be noted that Merton's awareness hypothesis is not directly tested in this study. The "visibility" construct is measured by analyst followings and print media attention.

by Stulz (1999) and Coffee (1999). By the end of the 1990s, an increasing number of researchers claim that the awareness hypothesis is somewhat dated as the world's financial markets are increasingly integrated and electronic communications are widely applied by stock exchanges. In contrast, investors in countries with weak investor protection are still vulnerable to direct insider self-dealing. It is not surprising to see insiders have control rights over 80% of the firm value by just holding 50% or less of the shares (Black 2001). As found by Claessens, Djankov, Fan, and Lang (2002), when the control rights of the largest shareholders exceed their cash-flow ownership, the entrenchment effect prevails and firm value is likely to fall.[26]

The main argument of the bonding hypothesis is that insiders find it more difficult to expropriate minority shareholders after cross-listing on a market with more stringent investor protection. In particular, Coffee (1999) asserts that the legal bonding mechanism of a U.S. listing takes three forms: (1) cross-listing firms are required to register their transactions with the SEC, (2) investors are legally entitled to take actions against the cross-listing firms at relatively low costs, and (3) the entry into the U.S. market per se is an indication of the cross-listing firm's commitment to improve information disclosure and governance practices.[27]

[26] An extensive discussion on managerial discretion can be found in Shleifer and Vishny's (1997) study.

[27] Regarding Coffee's (1999) first form of bonding (i.e. to register transactions with the SEC), the Securities Act of 1933 requires foreign companies that wish to sell securities in the U.S. markets to

This bonding hypothesis is, in general, consistent with the corporate governance study conducted by La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997), which establishes a strong link between the legal systems and corporate governance based on a sample of 49 countries.[28] In the series of studies conducted by this group of authors, it is found that legal protection of minority shareholders is associated with capital markets development (e.g. La Porta et al. 1997, 1998, 2000). In particular, common law countries such as the U.S. and the U.K. provide far better protections for minority shareholders than do civil law countries (La Porta et al. 1998).[29] A practical question that remains unaddressed in La Porta et al.'s papers is the set of laws that are most important for investors. The bonding hypothesis proposed by Coffee (1999) is based on the view that securities law is central to the value of publicly issued shares.

It can be argued, in theory, that a radical legal reform taking place in the home markets can improve the law of capital markets and legal protection of investors. However, at the firm-level, most firms in the emerging markets would find it easier and more efficient to opt into the foreign governance standards that have been

register with the Commission. An exemption from the registration requirements is allowed if certain specified conditions are met. Regarding Coffee's (1999) second form of bonding (i.e. to take actions against the cross-listing firms), legal actions are important means for minority shareholders to protect themselves from insiders' expropriation. Karolyi (2006), for example, points out that class actions and derivative actions brought by shareholders are not available in many emerging markets.

[28] Solomon (2010) comments that La Porta et al.'s (1997) work is the most influential work in the area of international corporate governance.

[29] La Porta et al.'s (1998) sample of 49 countries show that French civil law countries have the worst protection of corporate shareholders and creditors and the poorest quality of enforcement. German and Scandinavian civil law countries are ranked in the middle.

recognised by the vast majority of investors. If the securities law in the host market can effectively regulate domestic firms and strengthen corporate governance for the publicly traded firms, the same laws and regulations are also expected by investors and issuers to regulate cross-listing firms. This practice of borrowing the needed laws and institutions from strong host markets is described by Black (2001) as "piggybacking".

Consistent with the bonding hypothesis, Doidge, Karolyi, and Stulz (2004) show that growth opportunities are more highly valued for firms that choose to cross-list in the U.S., particularly those from countries with poorer investor rights. They conjecture that the explanation for the result is that a cross-listing on the U.S. market limits the extent to which controlling shareholders can engage in expropriation and thereby increases cross-listing firms' ability to take advantage of growth opportunities. Lang et al. (2003b) demonstrate that firms cross-listed on the U.S. markets have an improved information environment as required by the U.S. laws and this improvement is associated with higher market valuations. To a large extent, these empirical results only provide indirect evidence on the bonding hypothesis as they do not address the concern that corporate governance structures are endogenous responses to the benefits and costs of selecting the mechanisms that comprise those structures.

The bonding hypothesis is questioned by a significant number of studies. Gozzi, et al. (2008) document that Tobin's *q* rises before and during the cross-listing year, but falls sharply in the following year and offsets the initial increase. They interpret this result as a challenge to the bonding hypothesis which would predict an enduring Tobin's *q* if firms bond themselves to better corporate governance. Licht (2004) argues that cultural distance substantially limits the usefulness of cross-listing for corporate governance improvement, and the assumption that legal transplantation is relatively straightforward is unfounded. When firms choose between cross-listing destinations, geographic, economic, cultural, and industrial proximity are the most important factors that firms consider (Sarkissian and Schill 2004). When surveyed, finance officers cite business issues, such as increased investors' recognition, as the dominant reason for cross-listing, while they almost unanimously cite the increased disclosure requirement as the greatest obstacle to cross-listing (Fanto and Karmel 1997). It should be noted that, however, this survey was conducted in 1997, and interest in corporate governance is reviving in the wake of the corporate scandals and the 2008 global financial and economic crisis. Therefore, it is a good time for researchers to re-examine the validity of the bonding hypothesis in the context of cross-listing firms.

2.5 The U.S. and the U.K. Markets: A Regulatory Overview

2.5.1 Legal Institutions

The legal institutions that govern the world exert great influences on the corporate governance structures that in turn govern the business world. Compared with firm characteristics, country characteristics explain much more of the variation in the quality of corporate governance (Doidge, Karolyi, and Stulz 2007). The link between legal systems and corporate governance is explored in depth by La Porta et al. (1997, 2000) and La Porta, Lopez-de-Silanes, and Shleifer (1999). In particular, La Porta et al. (1997) identify four general legal traditions – English common law, French civil law, German civil law, and Scandinavian civil law systems – based on a sample of 49 countries. French civil law is regarded as one of the oldest judicial systems, but affords the lowest level of investor protection and the least developed capital markets. English common law countries, on the other hand, are known to offer the strongest investor protection reflected by their legal rules and the quality of their enforcement. In the "anti-director rights" measure constructed by La Porta et al. (1998), the U.S. and the U.K. both score 5 out of 6.[30]

If the legal origin argument is applied to cross-listing firms in conjunction with Coffee's (1999) bonding hypothesis, a major implication is that bonding via

[30] The "anti-director rights" measure is an index aggregating six different types of shareholder rights

cross-listing is more likely and more plausible if the host stock exchange markets are located in common law countries. This argument is evidenced by the domination of the U.S. and the U.K. stock exchange markets in the global competition for cross-listings. As mentioned previously, cross-listings on the NYSE, NASDAQ, and London Stock Exchange together account for about 70 percent of the total cross-listings on the world's top ten largest stock exchange markets. Another interesting fact is that 7 out of the top ten largest stock markets are located in common law countries.

2.5.2 The Regulatory Basis

Although the NYSE and NASDAQ are both based in the U.S., they are different in the types of issuers that they attract and the way that they operate. The NASDAQ OMX Group itself is a publicly traded company and is thus subject to the SEC standard filing requirements.[31] In contrast, the NYSE was organised as a not-for-profit exchange for more than 200 years, and it became a publicly listed company only recently – on March 8, 2006.[32] In general terms, the NYSE is perceived by investors to attract well established companies or blue chip firms and industries. NASDAQ is known as a market for high-tech firms that are perceived by

[31] NASDAQ OMX Group is listed on NASDAQ with the symbol "NDAQ".
[32] The NYSE began trading under the name NYSE Group (NYX) on the NYSE on March 8, 2006.

investors to be more volatile and growth-oriented.

In terms of the way that the stock exchanges execute, the NYSE is an auction market in which investors buy (sell) shares at the ask (bid) price established by a previously placed limit sell (buy) order of another investor, and NASDAQ provides a dealer's market in which investors buy at a dealer's ask price and sell at the dealer's bid price. Huang and Stoll (1996) find that the cost of executing transactions is higher on NASDAQ than on the NYSE, which is largely attributable to the dealers' limited incentives to narrow spreads on NASDAQ. Correspondingly, Reinganum (1990) documents a significant impact of the difference in market microstructure on liquidity premiums as small NYSE securities achieved average returns that are 6% higher than small NASDAQ securities. To improve its competitiveness as a financial market, NASDAQ now also has an electronic limit order book system.

Despite the operational differences between the NYSE and NASDAQ, they are both subject to SEC oversight. As a law enforcement agency, the SEC is charged with the responsibility to facilitate fair, orderly, and efficient operations of the capital markets in the U.S. primarily based on the regulatory rules set out in the Securities and Exchange Act of 1934.[33] As an effort to protect investors' rights, the SEC

[33] The SEC also enforces the Securities Act of 1933, the Trust Indenture Act of 1939, the Investment Company Act of 1940, the Investment Advisers Act of 1940, the Sarbanes-Oxley Act of 2002, and the Credit Rating Agency Reform Act of 2006.

conducts investigations into issues such as misrepresentation of information about securities, manipulation of the market prices of securities, insider trading, and the selling of unregistered securities.

The important regulatory role played by the SEC has triggered researchers' interest on the effectiveness of SEC enforcement actions. Cox, Thomas, and Kiku (2003) investigate the extent to which SEC enforcement actions and private securities fraud class actions overlap. They find that private cases with parallel SEC actions settle for significantly more money and take much less time. However, private actions with parallel SEC actions only account for 15 percent of all settled private cases of Cox et al.'s (2003) sample. The SEC also tends to target smaller companies than those targeted by private actions alone.[34] However, when large firms do commit securities violations, the consequences for investors are likely to be more disastrous than when small firms commit similar violations. The regulatory implication of the SEC's apparent preoccupation with smaller companies is that the SEC might have failed to meet its commitment to pursue cases where there are significant investor losses.

The Main Market of the London Stock Exchange is mainly governed by European Union (EU) law, UK Acts of Parliament, the Exchange's rules, and regulations imposed by the Financial Services Authority (FSA). As a member state of

[34] In Cox et al.'s (2003) study, company size is measured by market capitalisation.

the EU, the UK law system is greatly influenced by the unprecedented movement towards regulatory convergence in the EU. And the harmonisation of EU securities regulation is viewed as an important step to facilitate a single capital market (Chiu 2008). However, as London possesses a leading position in the EU capital markets, the London Stock Exchange tends to perceive EU securities regulation as minimum requirements, and the thresholds for a premium listing are much higher than those set out in the EU Directives.[35] The FSA is the principal regulator of the London Stock Exchange and is in charge of processing applications for admission to listing. The cross-listing firms' obligations are largely set out in the FSA rules in the FSA handbook, which consist of the FSA Listing Rules, the Prospectus Rules, and the Disclosure and Transparency Rules.[36] These rules closely parallel the major EU Directives, including the 2001 Directive on the admission of securities, the 2005 Prospectus Directive on the initial disclosure obligations, and the Transparency Obligations Directive. The U.K. FSA is different from the U.S. SEC in that the SEC is a federal agency while the FSA is an independent non-governmental body that acquires statutory powers through the UK Financial Services and Markets Act 2000. In cases of non-compliance with the FSA rules, the FSA will take actions from

[35] The major EU Directives governing the securities markets are the 2001 Directive on the admission of securities, the 2005 Prospectus Directive on the initial disclosure obligations, and the Transparency Obligations Directive.

[36] The FSA Rules are available at http://www.fsa.gov.uk.

warnings, financial penalties, and suspensions, to cancellations of listing, depending on the severity of the breach. In practical terms, the presence of the FSA means that the role of the London Stock Exchange is narrowed down to the admission and continuous monitoring of listed firms. For this purpose, the LSE Standards developed by the U.K. Listing Authority (UKLA) are mainly concerned with admission and disclosure.

In fact, the relatively merits of the U.S. and the U.K. regulatory structures are the subject of some furious debates. The SEC has long emphasised its focus on investor protection. However, as the world's financial markets become increasingly globalised and integrated, the mission of investor protection has also become more intricate and multidimensional than ever before. Atkins and Bondi (2008, 368) argue that the complexity inherent in investor protection should prompt regulators to rethink some of the basic questions such as "Who are the investors that should be protected?" and "How should they be protected?". As discussed above, the SEC's tendency to pursue small-sized firms is unlikely to be Pareto efficient.

In the U.K., the FSA had undertaken significant reforms between 2002 and 2005 aiming to simplify and restructure its rules relating to listed companies.[37] In effect, the FSA has cut back regulatory burden for depositary receipts, and it states that a

[37] An introduction of the reform is available at http://www.fsa.gov.uk/pubs/other/better_regulation.pdf.

higher level of protection for investors has been retained (FSA 2005). Although the literature does not provide direct empirical evidence in support of this argument, a large number of researchers are in fact proponents of this principles-based regulatory approach. For example, Ford (2008) comments that principles-based regulation is superior to rules-based regulation because on-the-ground implementation is more important than idealised statutory design. Ford (2008) criticises the SEC for its rules-based regulatory regime that gives little discretion in its enforcement actions. By focusing too much on prosecuting firms that fail to comply with a detailed rule, the approach has only a limited ability to address some broader organisational and cultural problems. Within the U.S., the principles-based approach is adopted by the Commodities and Futures Trading Commission (CFTC) which refused to merge with the SEC on the ground of the inappropriateness of the rules-based approach (Black 2008).[38] In Canada, the immediate neighbour of the U.S., the British Columbia Securities Commission has also adopted principles-based securities regulation.

2.5.3 Regulations and Reporting Requirements of Cross-listings

When firms cross-list their shares on a more developed and regulated market,

[38] CFTC is an independent agency that regulates commodity futures and option markets in the United States. Proponents of SEC/CFTC consolidation argue that this system of bifurcated regulation creates regulatory gap and inconsistency (Benson 1991).

increased public scrutiny, additional listing fees and compliance costs, and increased reporting and disclosure requirements are all potential costs to the cross-listing firms. It is therefore important to consider the implications of the regulations and reporting requirements on cross-listing firms. The initial and continued listing standards set out by different stock exchanges in the U.S. and the U.K. are summarised in Table 2.1 and Table 2.2 below, respectively.

The NYSE listing standards are often considered by researchers and practitioners as the most stringent of any securities markets in the world. A non-U.S. firm needs to meet either the earnings test or the valuation/revenue test (or affiliated company test if conditions are satisfied) in order to qualify for a NYSE listing. Under the valuation/revenue test, for example, the global market capitalisation of $500 million and an annual sales turnover of $100 million mean that cross-listing firms are required to be "large". It should be noted, however, that NASDAQ Global Select also implements high initial listing standards if foreign firms want to list under the valuation/revenue test. In particular, the revenue and market capitalisation thresholds are higher for NASDAQ Global Select than for the NYSE. For a standard NASDAQ Global listing, the initial listing threshold is much lower. Under the Earnings Test, NASDAQ only requires a pre-tax income of $1 million in the latest fiscal year or in two of the last three fiscal years.

Table 2.1

Initial Listing Standards for the Stock Exchange Markets in the U.S. and the U.K.[a]

Criteria Type	NYSE[b]	NASDAQ Global Select[c]	NASDAQ Global[d]	London's Main Market
Earnings Test[e]	Aggregate pre-tax income > $100M for the last three fiscal years, *and* Minimum pre-tax income in each of 2 preceding years >$25M.	Aggregate pre-tax income in prior three fiscal years > $11M,[f] *and* Pre-tax income in each of the prior three fiscal years > $0, *and* Each of the two most recent fiscal years > $2.2M.	Pre-tax income > $1M in latest fiscal year or in two of last three fiscal years.	Sufficient working capital for at least 12 months from the date of admission (premium listing).[g]
Valuation /Revenue Test[h]	Global market capitalisation > $500M, *and* Revenues in the most recent 12 month period >$100M, *and* Aggregate cash flow for last 3 years > $100M, *and*	Average market capitalisation > $550M over prior 12 months, *and* Revenues in previous fiscal year > $110M, *and* Aggregate cash flow for last 3 years > $27.5M, *and*	Market capitalisation > $75M, *or* Total assets and total revenues both > $75M in latest fiscal year or in two of last three fiscal years.	Market capitalisation > £700,000, *and* A revenue-earning record covering at least three years that supports at least 75 per cent of the company's business,[i] *and*

Table 2.1 (*continued*)

Criteria Type	NYSE[b]	NASDAQ Global Select[c]	NASDAQ Global[d]	London's Main Market
Valuation /Revenue Test[h]	Minimum cash flow in each of 2 preceding years > $25M.	Minimum cash flow in each of 2 preceding years > $0.		The final balance sheet is not more than six months before the date of the prospectus.
Affiliated Company Test[j]	Global market capitalisation > $500M, *and* At least 12 months of operating history.	Only liquidity requirements distinguish between IPOs and affiliated companies.	NA	Inappropriate related-party transactions must be eliminated, *and* The cross-listing firm should consider whether outside affiliations will be negatively perceived by the market.

[a]The summary of listing standards focuses on the accounting-based criteria and does not elaborate on the liquidity requirements (e.g. number of shareholders and publicly held shares) imposed by the stock exchanges.

[b]The listing requirements of the NYSE are available in The NYSE Listed Company Manual, Section 103.01 <Minimum Numerical Standards non-U.S. Companies Equity Listings>.

[c]NASDAQ Global Select Market was launched in 2006, which is a segment of the NASDAQ Global Market with very high initial listing standards.

[d]The listing requirements of NASDAQ are provided in NASDAQ Equity Rules, Section 5315 < Initial Listing Requirements for Primary Equity Securities>.

[e]A non-U.S. company only needs to satisfy one of the three tests: (1) The earnings test, (2) valuation/revenue test, or (3) affiliated company test.

Table 2.1 (*continued*)

[f]Pre-tax income refers to income from continuing operations before income taxes.
[g]In practical terms, this requirement is met by a provision of the working capital statement. This requirement applies to premium listings on the London Stock Exchange and does not apply to standard listings.
[h]This cash flow approach can be substituted by a pure valuation test that requires at least $750,000,000 in global market capitalisation and at least $75,000,000 in revenues during the most recent fiscal year.
[i]In practical terms, this means that a firm must provide financial information of major acquisitions that amount to 25 per cent or more of its business. This requirement applies to premium listings on the London Stock Exchange and does not apply to standard listings.
[j]Affiliated Company Test can be applied if and only if the company's parent or affiliated company is a listed company on the NYSE in good standing, and the company's parent or affiliated company retains control of the entity.

As shown in Table 2.2, the continuing listing requirements for the NYSE and NASDAQ are similar, including the price criteria of $1, market capitalisation of $50 million, and total shareholders' equity of $50 million. In comparison with the stringent numerical thresholds imposed by the U.S., the listing requirements for the London Stock Exchange are relatively flexible. For example, it asks for evidence of sufficient working capital, which can be met by a provision of a working capital statement. Also, numerical criteria listed above are not absolute. For instance, the UKLA allows cross-listing firms to go below the 25 per cent free float, provided that the firm's market capitalisation is sufficiently large that a smaller percentage still allows for a liquid market in the stock (London Stock Exchange 2010, 34).

Table 2.2
Continued Listing Standards for the Stock Exchange Markets in the U.S. and the U.K.

Criteria Type	NYSE	NASDAQ Global Select	NASDAQ Global	London's Main Market
Price Criteria	Average closing price < $1.00 over a consecutive 30 trading-day period	Bid price < $1	Bid price < $1	NA
Numerical Criteria	Average global market capitalization over a consecutive 30 trading-day period < $50M,[b] *and* Total shareholders' equity < $50M, *or* Average global market capitalisation over a consecutive 30 trading-day period < $15M.	Market capitalisation < $50M, *or* Total assets or total revenues <$50M in latest fiscal year or in two of last three fiscal years, *or* Total shareholders' equity < $50M.	Market capitalisation < $50M, *or* Total assets or total revenues <$50M in latest fiscal year or in two of last three fiscal years, *or* Total shareholders' equity < $50M.	25% free float, *and* 75 per cent shareholder approval required for cancellation.[c]

[a]This table summarises major quantitative continued listing criteria only. Some stock exchanges conduct further investigations (both quantitative and qualitative) when an issuer falls below any of the continued listing criteria.
[b]NYSE applies different numerical criteria for companies listed under different standards. The table summarises the requirements for companies listed under the Earnings Test.
[c]This cancellation rule only applies to a premium listing on the London Stock Exchange.

2.5.4 The SOX Dispute – A Race towards the Top vs. a Race to the Bottom

A popular yet disputed explanation for the decrease in cross-listings on the U.S. markets in the late 2000s is the passage of the Sarbanes-Oxley (SOX) Act of 2002, which has drastically increased the compliance costs of a U.S. listing.[39] In contrast, the increase in cross-listings on the U.K. markets during the same period may be explained by the conjecture that some firms are screened out by SOX while encouraged by the FSA's seemingly friendly regulatory requirements.[40] To evaluate these arguments, it is important to know the impacts of SOX on cross-listing firms in the U.S. markets. Table 2.3 summarises the key sections of SOX that apply to cross-listing firms.

A contentious aspect of SOX for cross-listing firms is that although SOX was passed in response to domestic scandals such as the high-profile failures of Enron and WorldCom, it applies to all issuers in the U.S. including foreign issuers. Historically, the SEC has never imposed rules that make cross-listing firms subject to equivalent measures in the domestic markets (Woo 2006).

[39] On August 2, 2006, California-based Napo Pharmaceuticals Inc. became the first U.S. company to go public on the London Stock Exchange's Main Market (Napo Pharmaceuticals 2008). Prentice (2007) suggests that a primary reason for Napo Pharmaceuticals' choice of listing on the London Stock Exchange is the high compliance costs of SOX.

[40] As discussed before, the FSA restructured and simplified the UK listing regulation for cross-listing firms during the period between 2002 and 2005, which coincided with the introduction of SOX.

Table 2.3

The Impact of SOX on cross-listing firms[a]

Section	Major Requirement	Exemption Authority[b]
301	Members of the audit committee shall be independent of the issuer.	Section 301 3(c)
302	Principal executive officers and principal financial officers are required to certify annual reports and their responsibility for effective internal controls.	Not available[c]
401	The disclosure of all material off-balance sheet items is required.	Not available
404	The management and the external auditors are required to report on the issuer's internal control.	Not available
906	Criminal penalties for the CEOs or the CFOs if they certify financial reports knowing these reports fail to comply with the requirements	Not available

[a]In the original legal text, cross-listing firms are known as "Foreign Private Issuers". Rule 405 of the Securities Act of 1933 defines a foreign private issuer as any foreign issuer other than a foreign government except an issuer that is better classified as a U.S. issuer. The assessment of the nature of the foreign company is based on numerical conditions such as more than 50% of the outstanding voting shares are owned by the U.S. residents and the majority of executive officers are U.S. citizens or residents.

[b]The exemptions are not pertinent to cross-listing firms. Instead, the exemption provisions give the SEC the authority to exempt any issuers in the U.S. markets from the stated sections as the SEC determines appropriate in light of the circumstances.

[c]Section 302(b) of the Act explicitly states that issuers are not allowed to escape this section by actions such as foreign re-incorporations that change the corporate domicile to outside of the U.S.

The increase in compliance costs is not necessarily accompanied by an increase in transparency or an improvement in governance. Some of the rules even contravene cross-listing firms' practices. For example, Woo (2006) points out that Section 302 might not suit Germany because all the members on the management board of German companies represent the company jointly, and consequently it would be difficult to identify a chief executive officer who is well above other executives. Section 301 is also difficult to be applied to companies originating from civil law countries where a two-tier board is often required. In such cases, the lower management board is not independent while the upper board is not usually given significant substantive responsibilities (Woo 2006).

The debate over the different regulatory approaches taken by the U.S. and the U.K. is centred on whether this will lead to a race towards the top or a race to the bottom (Coffee 1999). The race to the bottom occurs when firms choose to cross-list in more lenient regulatory regimes and regulators are pressured to relax their own securities regulations. This is unlikely to be the case of the U.S. given its more centralised securities regulation after SOX. However, the empirical evidence is mixed with regard to the benefits provided by SOX. Hail and Leuz (2009) report a significant reduction in firms' cost of capital when they cross-list on the U.S. markets, and the effect is sustained after the passage of SOX. They do not find similar effects when firms cross-list on the U.K. market. In contrast, Litvak (2007) finds that the stock prices of cross-listing firms subject to full SOX compliance decreased significantly in comparison to cross-listing firms not subject to full SOX compliance.[41] She argues that investors expected SOX to have a net negative effect on cross-listing firms.

2.5.5 The Territorial vs. the Market Approach to Securities Regulation

Despite the benefits and costs directly attached to SOX, there are few accounting and finance researchers who evaluate the SEC's territorial approach to jurisdiction that requires cross-listing firms to enhance disclosure and still, in some cases reconciliations to U.S. GAAP. Apparently, the current disclosure framework adopted by the SEC is based on the assumption that the information disclosed under U.S. GAAP is superior to the information disclosed under cross-listing firms' home-country accounting standards. However, this assumption has been challenged by empirical evidence in the past few decades. Baumol and Malkiel (1993), for example, conduct a survey of leading globally diversified funds and examine whether these specialised investment funds were able to outperform market indices such as the

[41] Level II ADRs and Level III ADRs trading on the NYSE, NASDAQ, or AMEX are required to fully comply with SOX. Level I ADRs trading on OTC Pink Sheets are only required to comply with criminal and whistleblower provisions of SOX.

S&P 500. The survey results suggest that funds that are specialised in foreign equities could not outperform international stock indices. Baumol and Malkiel (1993) therefore argue that the U.S. securities markets are not more efficient than other international markets and there is a strong case for eliminating the SEC reconciliation rules imposed on cross-listing firms.[42] Consistent with this conjecture, Kim, Li, and Li (2012) find that the elimination of the reconciliation requirement for cross-listing firms using IFRS has no significant impacts on cross-listing firms' market liquidity, cost of equity, institutional ownership, stock price efficiency, or analyst forecasts.

Scholarly discussions in the legal journals take a broader view of the institutional frameworks and analyse the appropriateness of the current U.S. securities regime and the ability of the SEC to enforce the listing regulations. In particular, the proponents of regulatory competition argue that cross-listing firms in the U.S. should be allowed to have the right to choose the securities laws in their own jurisdiction (Choi and Guzman 1997). Forcing cross-listing firms to reconcile their financial information with U.S. GAAP requirements is dangerous for both investors and firms. On the investors' side, the reconciliation requirement may lure American investors to believe that the financial information of the cross-listing firms is comparable to the financial

[42] The SEC has relaxed the reconciliation requirement when cross-listing firms file with the SEC. The SEC has passed new rules that exempt the reconciliation requirement for non-U.S. firms that prepare financial statements using IFRS. Baumol and Malkiel (1993) are among the earliest studies that call for the removal of reconciliation requirement.

information of U.S. domestic listings while this is often not the case (Lang et al. 2003a). On the firms' side, cross-listing in the U.S. is more costly if they have to comply with the SEC rules. Fanto and Karmel (1997) argue that a cross-listing onto the U.S. market would only be financially justified if the foreign firm is intended to raise more than $300 million. Taking into account the passage of SOX and the inflated U.S. dollar since Fanto and Karmel's (1997) study was conducted, the cost to comply with the SEC rules is much higher today.

The argument for regulatory competition corresponds with the increasing importance of reciprocity in the body of existing international law. Under a normal reciprocity regime, the host country should allow foreign firms to cross-list their shares in the host market within the firms' home-country jurisdiction. If firms have the discretion to choose the jurisdiction for cross-listings, the likely consequence is a separation of regulatory regimes regarding securities laws, and the regulatory competition produces a race to the top. Countries with stringent investor or antifraud protection measures are likely to attract high quality cross-listing firms which are committed to improve corporate governance as described by the bonding hypothesis. For similar reasons, cross-listing firms would choose the securities regime that potential investors prefer so that their cost of capital can be reduced (Romano 1998). In comparison, countries with weak legal protection measures are likely to attract low quality cross-listing firms whose main aim is to raise quick capital via relatively inexpensive host markets. A key assumption underlying the argument for regulatory competition is that investors are rational and knowledgeable enough to analyse why firms choose certain jurisdictions over others. For example, if an investor believes that the U.S. system of law provides better investor protection and legal enforcement than the U.K. system of law, he or she can pay a premium for the U.S. cross-listings or discount the price that he or she is willing to pay for the U.K. cross-listings. Choi and Guzman (1997) argue that this reciprocity regime works better than the dictated regulatory regime imposed in the U.S. securities markets because it is practically difficult for the U.S. securities laws to reach and to protect transactions conducted by cross-listing firms in other jurisdictions.[43] In such cases, the mandatory U.S. securities laws may create a greater risk of fraud for cross-listing firms.

2.6 Cross-listing Firms' Incentives for Earnings Management

2.6.1 An Overview of Earnings Management Practices

Accounting standards and rules offer managers discretion in financial reporting

[43] Choi and Guzman (1997) cite the 1997 administrative proceeding brought by the SEC against GFL Ultra Fund Ltd to demonstrate the loss of protection provided by the U.S. securities laws regarding offshore transactions. GFL Ultra Fund Ltd is a British Virgin Islands investment company that utilises the loophole in Regulation S of the Securities Act of 1993 to make profits. GFL's trading strategy closely resembles a modified form of arbitrage that almost guarantees a profit from offshore share purchases and hedging.

so that managers could use their knowledge about their businesses to select financial reporting methods and estimates that best feature a firm's financial performance. However, it is well documented in the accounting literature that such discretion creates opportunities for managers to exercise judgement in financial reporting and in structuring transactions for opportunistic reasons.

Healy and Wahlen (1999, 368) define earnings management as managers' use of judgement in financial reporting to "alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers".

This definition conveys two important reasons for earnings management – to "mislead some stakeholders" or to "influence contractual outcomes". The former is largely related to the general assumption that underlies many positive accounting studies. Namely, accounting numbers supply information to the security markets, influence investors' expectations and decisions, and therefore stock prices.[44] Dechow and Skinner (2000) argue that practitioners view stock market reactions as the most important incentive for earnings management and many earnings management techniques cannot be easily detected by financial market participants. Consistent with

[44] Watts and Zimmerman (1990) note that modern positive accounting research started to gain popularity since the 1960s as Ball and Brown (1968), Beaver (1968), and others introduced empirical finance methods to financial accounting. Since then, the relation between accounting numbers and stock prices have become an important focus of financial accounting studies.

this conjecture, Sloan (1996) shows that the greater subjectivity of accruals introduces greater uncertainty into the accrual component as compared to the cash flow component, and investors do not fully anticipate the lower earnings persistence. Built on this observation, Richardson, Sloan, Soliman, and Tuna (2005a) conduct reliability assessments for the accrual categories from balance sheet decompositions and attribute low earnings persistence and security mispricing to less reliable accruals.

In order to better distinguish the variations in accruals that are due to manipulations from those that stem from normal economic activities, the concept of abnormal accruals (often termed "discretionary accruals") has emerged and grown in the accounting literature. Prior studies on stock market incentives have yielded fruitful results by using abnormal accruals to test whether, when, and how managers manipulate earnings to mislead investors in the capital markets. For example, empirical studies find that managers are likely to overstate earnings surrounding important events such as initial public offerings (Teoh, Welch, and Wong 1998) and seasoned equity offerings (Rangan 1998) through positive (i.e. income increasing) discretionary accruals. A strong incentive for managers to do so is that the financial market overestimates the persistence and earnings implications of abnormal accruals, and consequently overprices these accruals (Xie 2001).

Moreover, prior studies also find that managers manipulate earnings to achieve small positive earnings (Hayn 1995), to avoid earnings decreases and losses (Burgstahler and Dichev 1997), or to meet and beat analyst forecasts (Degeorge, Patel, and Zeckhauser 1999). These opportunistic behaviours of managers are all consistent with what Healy and Wahlen (1999) refer to as “mislead some stakeholders”.

According to Healy and Wahlen (1999), accounting discretion can also be used by managers to influence contractual outcomes. Accounting-based measures used in compensation and debt contracting may induce earnings management for various reasons. Healy (1985) demonstrates that managers’ accrual policies and policy choices stem from financial incentives of their bonus contracts. Gaver, Gaver, and Austin (1995) extend Healy’s (1985) study by examining firms’ earnings management behaviour when bonus plans have upper and lower bounds. They find that managers select income-increasing discretionary accruals when earnings are below the lower bound and income-decreasing discretionary accruals when earnings exceed the upper bound. Managers’ choices of income-increasing accounting methods are also positively related to the existence of debt covenants. Beatty and Weber (2003) find that borrowers whose bank debt contracts allow accounting method changes to affect contract calculations are more likely to make income-increasing accounting method choices. Similarly, DeFond and Jiambalvo (1994) report evidence of positive abnormal working capital accruals in the year of debt covenant violation.

2.6.2 Evidence of Earnings Management from Cross-listing Firms

A common starting point used by researchers to seek evidence of earnings management is to identify managers' incentives to manage earnings. The literature on earnings management suggests that such incentives are determined by the relative costs and benefits of earnings management (e.g. Ball, Kothari, and Robin 2000; Ball and Shivakumar 2005).

Going back to Healy and Wahlen's (1999) definition of earnings management, cross-listing firms may manage earnings to mislead some stakeholders or to influence contractual outcomes if doing so could yield more benefits than costs. As many public firms do, cross-listing firms wish to obtain cheaper capital and to increase stock price performance. At the same time, empirical studies indicate that accounting measures do have significant impacts on the stock prices of cross-border firms (e.g. Harris and Muller 1999; Lang et al. 2003b). Therefore, opportunities and incentives both exist for cross-listing firms to manage accounting numbers to mislead investors in the stock markets. Consistent with this conjecture, Ndubizu (2007) finds that firms appear to engage in some levels of earnings management at the time of cross-listing to maximise benefits that can be derived from cross-listing.

Earnings quality of cross-listing firms may also be significantly influenced under the pressure to meet regulatory thresholds and to satisfy stakeholders' expectations.

As outlined in Table 2.1, for example, the NYSE Earnings Test requires an aggregate pre-tax income of more than $100 million for the last three fiscal years and a minimum pre-tax income of $25 million in two consecutive years up to and including the cross-listing year. Foreign firms with smooth earnings and performance are thus more likely to meet these demanding listing thresholds and enjoy the benefits of cross-listing. In periods subsequent to the cross-listing event, cross-listing firms also have a strong incentive to smooth earnings due to the potentially high political costs, high probability of government intervention in cases of large losses, and the common presence of risk-averse stakeholders (e.g. labour and banks) on corporate boards in some host countries (Lang, Raedy, and Wilson 2006).

Lang et al. (2003a) compare firms cross-listed on the U.S. exchanges relative to a matched sample of foreign firms that are not cross-listed in the U.S., and find that firms cross-listed in the U.S. appear to be less aggressive in terms of earnings management and report accounting data that are more conservative. This is consistent with the bonding hypothesis that insiders find it more difficult to expropriate minority shareholders after cross-listing on a market with stronger investor protection. However, when comparing cross-listed non-U.S firms with U.S. listed firms, Lang et al. (2006) find that non-US firms' earnings exhibit more evidence of earnings management, lower accounting quality, and lower association of earnings with share price. They also report more evidence of earnings management for firms reconciling to U.S. GAAP than for those preparing local accounts in accordance with U.S. GAAP.

However, earnings management does not come without a cost. It might lead to SEC investigations and litigation, firms' and managers' reputational losses, investors' loss in confidence, damage to firm value, and in worst cases, corporate failures. This raises the question of whether it is worthwhile to put cross-listing firms' reputation and value at risk. When the perceived risk of litigation is high, the potential costs of aggressive earnings management would almost certainly outweigh the benefits and *vice versa*.

Studies in this area point to the general conclusions that host country law and enforcement are not an effective replacement for strong investor protection in cross-listing firms' host country. Favoured by common law legal systems, a firm is mainly governed by the company law of its home country. This creates a regulatory mismatch where a cross-listing firm needs to comply with elements of the securities law and the listing rules of the host country while the company law of its home country also applies (MacNeil 2001). Therefore, even if cross-listing firms nominally face the same basic regulations as domestic firms in the host country market, regulatory forces in practice are often reluctant to pursue claims against foreign firms. As discussed by Siegel (2005), SEC action against cross-listing firms has been rare and mostly ineffective throughout the history of securities laws due to issues of jurisdiction and priorities. The deficiency of host country enforcement means that the legal bonding device may be weaker than has previously been assumed (MacNeil 2001). Together these findings suggest that cross-listing firms have strong incentives to manage earnings while penalties imposed by the regulatory forces are relatively weak in practice.

Looking forward, more empirical evidence on earnings quality of cross-listing firms is needed to shed light on regulatory policies. In 2007, the U.S. SEC waived the U.S GAAP reconciliation requirement. Foreign private issuers in the U.S. are no longer required to reconcile financial statements prepared in accordance with IFRS in their SEC filing to U.S. GAAP. This regulatory change has been opposed by some researchers on the ground that material differences between IFRS and U.S. GAAP exist, and the reconciliations convey important information to market participants (Hopkins et al. 2008).[45] However, proponents of the change document that cross-listing firms domiciled in weaker investor protection countries voluntarily improve earnings quality by disclosing more persistent earnings (Kang et al. 2012). To address such concerns, it is important to know why foreign firms choose a particular

[45] Hopkins et al.'s (2008) commentary is prepared on behalf of the American Accounting Association's Financial Accounting and Reporting Section of the Financial Reporting Policy Committee.

host market and whether stringent regulatory environments do translate into high quality of earnings.

2.6.3 Cross-listing Research Using Non-U.S. Evidence

A series of studies compare exchanges in the U.S. with the London Stock Exchange from different angles. Roosenboom and Dijk (2009), by analysing cross-listings from 44 different countries on eight major stock exchanges, find that financial markets react positively to cross-listing announcements for cross-listing on the London Stock Exchange and the U.S. exchanges. However, their study does not find significant announcement returns for cross-listings on exchanges in continental Europe or the Tokyo Stock Exchange. Bianconi and Tan (2010) also find evidence that there is a cross-listing premium in the U.K. market, but the evidence on whether this premium is higher than that in the U.S is mixed. In fact, Doidge et al. (2009a) report that cross-listings have been falling on the U.S. exchanges as well as on the Main Market in London. They believe that this decline in cross-listings is explained by changes in firm characteristics instead of by changes in the benefits of cross-listing, and a significant premium for U.S. cross-listing still exists for foreign firms. Consistent with Doidge et al. (2009a), the exchange choice model developed by Piotroski and Srinivasan (2008) indicates that the listing preferences of large cross-listing firms choosing between the U.S. and the U.K. did not change after the enactment of SOX while smaller cross-listing firms with weaker government structures are screened out of the U.S. markets.

An increasing number of studies also examine cross-listing activities in non-U.S. countries as the U.S.'s leading position as the global leader in capital markets gradually diminishes. Frijns, Gilbert, and Tourani-Rad (2010) conduct cross-listing research using Australia and New Zealand evidence and find that the importance of the Australian market is increasing for both Australian and New Zealand domiciled firms.

2.7 Summary

This chapter has provided a discussion of the cross-listing literature. From an evolutionary standpoint, firms' cross-listing decisions are substantially influenced by the perceived benefits of the cross-listing destinations during different periods of time. For the past few decades, the NYSE, NASDAQ, and the London Stock Exchange were the most popular destination markets for cross-listing. By listing on these markets, firms are expected to reduce their cost of capital, improve liquidity, increase investors' recognition, and commit themselves to improve governance and protection of minority shareholders.

To further understand how the legal bonding mechanism works, this chapter also highlights legal institutions and the regulatory basis that underlie the NYSE, NASDAQ, and the London Stock Exchange. In particular, the NYSE and NASDAQ are both subject to SEC oversight, which has long emphasised its focus on investor protection. The Main Market of the London Stock Exchange is governed by the FSA, which had undertaken significant reforms to simplify and restructure its rules relating to listed companies. Researchers are curious as to which regulatory approach produces more net benefits for cross-listing firms and investors. An important yet little discussed issue is the link between firms' cross-listing choices and their earnings quality.

Prior studies provide some evidence that cross-listing firms engage in earnings management to overcome listing thresholds or to mislead investors in the stock markets. Compared with domestic firms in the host country, cross-listing firms face less litigation risk as evidenced by the rarity of SEC actions against foreign firms. When the U.S GAAP reconciliation requirement was waived, researchers again cast doubt on whether investors would be disadvantaged by poor disclosure of cross-listing firms. To address these concerns, it is important to understand the impacts of host and home country regulatory environments on the quality of earnings. The next chapter will use this background to develop hypotheses for empirical testing.

CHAPTER 3

HYPOTHESES DEVELOPMENT

3.1 Introduction

This chapter develops hypotheses regarding the earnings quality issues raised in Chapter 2. In particular, the hypotheses are concerned with *when, where, how,* and *why* cross-listing firms manage their earnings. First, cross-listing firms on the U.S. markets are found to engage in accrual-based earnings management at the time of cross-listing (Ndubizu 2007). It is important to examine whether this result is robust to controlling for other determinants of earnings management levels and whether this result is consistent across different cross-listing destinations such as the U.K. markets. The need for further inquiry into the result forms the basis of the first hypothesis. Second, previous research documents a significant difference in earnings quality between cross-listing firms and non-cross listing firms in the home countries. Built on the empirical study of Lang et al. (2003a), the second hypothesis is concerned with the difference in earnings quality between cross-listing firms and their home country counterparts, and predictions are developed regarding the differential impact of cross-listing destinations on the difference in earnings quality. Third, the existing literature on cross-listing argues for a significant difference between firms cross-listed on the U.S. markets and firms cross-listed on the U.K. markets in terms of their listing incentives, firm-level characteristics, governance quality, and stock performance (Piotroski and Srinivasan 2008). The third hypothesis extends prior literature by providing an updated view of cross-listing choices from an earnings quality perspective. The fourth hypothesis is concerned with the impacts that country-level and exchange-level listing incentives might have on cross-listing firms' earnings management behaviours. Although the existing literature has not yet directly answered this question, a growing number of accounting studies, especially studies including international comparisons, do address legal and institutional matters based on the argument developed by La Porta et al. (1997, 1998). The fourth hypothesis builds on La Porta et al.'s work to explore and make predictions about the likely impacts of country-level and exchange-level factors on reporting incentives and earnings quality.

3.2 Evidence of Earnings Management at the Time of Cross-listing

In Section 2.5 of Chapter 2, the review of the regulatory requirements regarding cross-listing in the U.S. and the U.K. markets reveals that these two markets impose very stringent listing standards compared to other major stock exchanges in the world. Chemmanur and Fulghieri (2006) argue that stock exchanges have strong incentives to set appropriately high listing standards to strike a balance between reputation and popularity. If a stock exchange has too high a standard for cross-listing firms, it tends to banish foreign firms which are either unqualified or perceive the standards to be unjustified. On the other side, if a stock exchange sets lower listing standards, it may risk its reputation by letting low-quality issuers get mixed up with high-quality issuers.[46]

As mentioned before, the NASDAQ OMX Group is founded as a publicly traded company and the NYSE has also recently transformed from a not-for-profit exchange to a publicly listed company. In the U.K., the London Stock Exchange is owned by the London Stock Exchange Group (LSEG) which operates a range of international equity, bond and derivatives markets.[47] These stock exchanges are value-maximising entities that seek to enhance their sustainability and long-run profits by setting appropriate listing standards. Following this reasoning, the NYSE, NASDAQ, and the London Stock Exchange all have strong incentives to set high listing standards because they are considered by firms and investors as first-tier stock markets. This is consistent with the argument for regulatory competition where high reputation stock exchanges

[46] Empirical evidence on the signalling hypothesis suggests the existence of techniques that firms can utilise to signal their quality to investors at the time of listing. For example, Allen and Faulhaber (1989) document the phenomenon that high-quality issuers tend to underprice their initial issue of shares to advertise a high-quality issue, and investors know that only high-quality issuers can recoup the cost of this signal from subsequent issues. The implication of the signalling hypothesis is that low-quality issuers cannot expect to stay detected as high-quality issuers can seek ways to separate themselves from low-quality issuers. A stock exchange market is also likely to suffer from the damage in reputation as it accepts more low-quality issuers.

[47] The LSEG is listed on the London Stock Exchange with the symbol LSE.L.

set high listing standards to reinforce their positions as prestigious capital markets.

Under the rules-based regime, the NYSE and NASDAQ set high initial standards based on numerical measures. Taking the NYSE as an example, the earnings test requires non-U.S. listed companies to have a minimum of $US 100 million aggregate pre-tax income for the latest three fiscal years up to and including the cross-listing year and a minimum pre-tax income of $US 25 million in each of the two years immediately preceding the cross-listing year.[48] Similarly, to gain admission to NASDAQ, a foreign firm is required to have a minimum of $U.S. 11 million aggregate pre-tax income in the prior three fiscal years and $US 2.2 million pre-tax income in each of the two most recent fiscal years.

For foreign firms which are close to but do not meet these admission thresholds, the incentives to manipulate earnings to meet these regulatory thresholds are strong. Once these foreign firms manage to get cross-listed, they would gain access to potential benefits of cross-listings such as a sustained decrease in the cost of capital (Hail and Leuz 2009), improvements in liquidity (Amihud and Mendelson 1986), and increased investor recognition (Merton 1987). Consistent with the bonding hypothesis, Doidge et al. (2004) also show that growth opportunities are more highly valued for

[48] To qualify for a NYSE listing, a foreign firm only needs to satisfy one of the three tests: (1) the earnings test, (2) the valuation/revenue test, or (3) the affiliated company test. Although the earnings test is only one of the three ways to qualify for a NYSE listing, the other two types of tests also impose high numerical thresholds as discussed in Section 2.5.3 of Chapter 2.

firms that choose to cross-list in the U.S. These potential benefits of cross-listing provide these firms with strong incentives to overcome barriers to cross-listing, pertaining especially to the listing thresholds set by regulators in the host market. The first study that documents firms' engagement in earnings management at the time of cross-listing events is Ndubizu (2007). He finds that cross-listing firms' return on assets (ROA), cash flows, and working capital accruals peak in the listing period and fall subsequently (i.e. in the following two years). Also, cross-listing firms have significantly higher discretionary accruals in the year of cross-listing than a sample of U.S. domestic firms matched on industry and performance.

While significant cross-listing benefits exist, an important incentive for earnings management at the cross-listing event is the relatively weak regulatory forces against foreign firms. As discussed in Section 2.6.2 of Chapter 2, while cross-listing firms nominally face the same basic regulations as U.S. firms, recent studies suggest that regulators in practice are often reluctant to pursue claims against foreign firms (Siegel 2005). This suggests that it is both "desirable" and "feasible" for cross-listing firms to manage earnings around the cross-listing events as benefits are significant while penalties imposed by the regulatory forces are relatively weak in practice. Therefore, consistent with the findings of Ndubizu (2007), cross-listing firms are predicted to manage earnings upwards in the period surrounding the cross-listing event. This leads to the first hypothesis:

H_{1a}: Cross-listing firms manage earnings upward in the period surrounding cross-listing on the U.S. markets.

In a similar way, firms that choose to cross-list on the London Stock Exchange also seek to maximise the benefits that can be derived from the cross-listing events. The degree to which cross-listing benefits can be exploited by a foreign issuer is initially related to investors' perception about the issuer based on the information contained in the prospectus. This provides firms with incentives to engage in opportunistic earnings management at the time of cross-listing. For firms that decide to cross-list on the London Stock Exchange, their ability to manage earnings is likely to be higher than firms that decided to cross-list on the U.S. markets because cross-listing on the London Stock Exchange does not involve material changes in accounting disclosure requirements (Licht 2004). At the same time, however, firms face much less pressure to manage earnings to meet regulatory thresholds in the case of a U.K. cross-listing. Different from the numerical measures imposed by the U.S. stock exchanges, the listing requirements for London Stock Exchange are much more flexible as the UKLA does not impose strict bright-line rules for deciding whether a foreign issuer is qualified for cross-listing. It is also worth noting that the numerical measures adopted by the NYSE and NASDAQ are primarily based on accounting numbers such as income and cash flow. In comparison, the only numerical threshold imposed by the London Stock Exchange is a minimum market capitalisation of £700,000 and the UKLA has the discretion to lower the threshold for companies with good growth potential.[49] These competing arguments lead to the second hypothesis:

H_{1b}: Cross-listing firms manage earnings upward in the period surrounding cross-listing on the U.K. markets.

To explore this issue further, this thesis also takes a close look at IPO issues as previous studies have documented significant impacts on cross-listing firms' reporting motives. An IPO firm in this thesis refers to a foreign issuer that raises new equity capital at cross-listing while a non-IPO firm is one that only cross-lists existing home-country public shares on the foreign market resulting in a cashless transaction. IPO firms, compared with non-IPO firms, have stronger incentives to manage earnings because IPO firms would like to issue shares at the highest price possible in order to raise sufficient capital with less earnings or control dilution. Accepting the empirical evidence that stock price is associated with earnings, IPO firms would have stronger incentives than non-IPO firms to manipulate earnings upwards as they expect

[49] There is also an unwritten rule for AIM companies that they should look for a Main Market listing if the projected market capitalisation is likely to exceed £500 million.

higher earnings to lead to higher stock prices and therefore lower costs of capital.

Research on the long-run market performance of IPO firms does support the conjecture that IPO firms use positive accruals to report earnings in excess of cash flows. Ritter (1991) first documents the long-run underperformance of IPO firms in the stock markets and names this phenomenon “the new issues puzzle”. Following Ritter’s (1991) research, studies such as Teoh et al. (1998) and Cotten (2008) argue that a likely explanation for the new issues puzzle is managers’ upward earnings management. IPO firms with high discretionary current accruals in the IPO year compared to their industry peers are likely to experience poor stock return performance three years after the IPO event (Teoh et al. 1998).

The IPO process is susceptible to earnings management because information asymmetry between issuers and investors is relatively high before the issuer goes public.[50] The prospectus is the main source of information that investors rely upon in making investment decisions, and a typical prospectus contains several years’ summary financial statements. As a result, firms have strong incentives and a reasonably good chance to manage earnings shown in the prospectus upwards as they would expect high earnings to translate into a high offering price. Although the financial statements presented in the prospectus are subject to auditing by external

[50] In an unpublished working paper, Rao (1993) provides evidence that most firms are exposed to very little, if any, media coverage before the IPO.

auditors, the focus of prospectus auditing is to verify the issuer's compliance with GAAP and thereby add credibility to the accounting disclosure.[51] It does not take away managers' discretion in deciding the timing and amounts of revenues and expenses as permitted by the accrual accounting system mandated by GAAP.

While a cash injection is likely to provide an incentive for IPO firms to boost earnings, the existing literature provides mixed empirical evidence on how strong the incentive is. After all, deliberate attempts to use accruals to boost earnings are not sustainable since "manipulative" accruals will in all likelihood reverse. And managers know that aggressive earnings management would eventually lead to poor post-IPO returns that also undermine firms' ability to raise equity capital through seasoned equity offerings. Bancel and Mittoo (2001) conduct a survey on European managers' perception of the costs and benefits of foreign listing. They find that the majority of managers believe that the increase in prestige and the growth in shareholders are the main benefits of cross-listing. If this is the case, the incentives for earnings management largely lie in meeting the regulatory thresholds to get cross-listed and to get recognised by global investors, rather than the amount of proceeds obtained from the IPO event. Then, it could not be argued that IPO firms are more likely to

[51] Prior studies report that auditors play an important role in convincing investors about the value of the issuers. When a highly reputable auditor is involved in the prospectus, investors require significantly lower underpricing (Beatty 1989).

manipulate earnings than non-IPO firms. Consistent with this conjecture, Ndubizu (2007) finds that both IPO and non-IPO firms exhibit similar change in accounting characteristics (i.e. ROA, cash flows, working capital accruals, and discretionary accruals) in an event window spanning from two years before to two years after the cross-listing year.

Earlier empirical analyses on IPO firms also claim that firms do not appear to go public for the reason of raising funds for future investments, but to rebalance their accounts after high investment and growth (e.g. Pagano, Panetta, and Zingales 1998; Zingales 1995). A recent study conducted by Ayyagari and Doidge (2010) lends support to this view by suggesting that a U.S. cross-listing is used by controlling shareholders in the home country as a mechanism to facilitate the change in ownership and control with relatively low cost of transferring ownership.

In terms of reporting flexibility, IPO firms face stricter SEC reporting regulations than non-IPO firms. The current SEC regulation requires IPO firms to either provide U.S. GAAP financial statements or reconciliations of net income and shareholders' equity to U.S GAAP unless the cross-listing firm prepares and files its financial statements in accordance with IFRS. In comparison, Regulation G adopted by the SEC in January 2003 explicitly exempts foreign firms that have securities listed or quoted abroad before cross-listing (i.e. non-IPO firms) from having to comply with the reconciliation requirements. Therefore, non-IPO firms have more flexibility in managing earnings than IPO firms, even though the incentives for doing so may not be as strong. Based on the mixed evidence, the following hypothesis is stated in null form:

H_{1c}: IPO firms and non-IPO firms engage in the same level of earnings management in the period immediately before the cross-listing events.

3.3 Does Earnings Quality Differ by Cross-listing on the U.S. and/or the U.K Markets?

The next concern over cross-listing firms' earnings quality focuses on the benchmark that cross-listing firms are compared to. On the one hand, Lang et al. (2003a) suggest that firms cross-listed in the U.S. appear to be less aggressive in terms of earnings management than a matched sample of host-country firms which are not cross listed. On the other hand, Lang et al.'s (2006) study compares cross-listed non-US firms with US domestic firms and finds that cross-listing firms' earnings exhibit more evidence of smoothing, greater tendency to meet targets, lower value relevance, and less timely recognition of losses. Together these findings seem to suggest that whether cross-listing firms experience improvements in earnings quality is a matter of who they are compared to. Therefore, Hypothesis 2 aims to extend the literature by examining cross-listing firms' earnings quality improvements using both U.S. and U.K. evidence.

Lang et al. (2003a) identify two reasons as to why cross-listing firms may have higher earnings quality than firms that are not cross-listed in the U.S. First, firms self-select to cross-list on the U.S. markets and submit themselves to more stringent U.S. regulation. In line with the bonding hypothesis, firms are likely to be willing to bond themselves to better investor protection by cross-listing in the U.S. Second, cross-listing firms may choose to change their local GAAP reporting and to meet the higher disclosure requirements imposed by the SEC.[52] Firms that commit themselves to more stringent accounting standards are expected to improve their earnings quality. For example, Barth, Landsman, and Lang (2008) find that firms applying International Accounting Standards (IAS) are associated with less earnings management and more timely loss recognition than a matched sample of firms applying non-U.S. domestic standards. Consistent with Lang et al.'s (2003a) reasoning, the first part of Hypothesis 2 is stated below:

[52] Although not specifically addressed in this thesis, it is important to note that prior studies report different impacts of the U.S. disclosure requirements on different cross-listing firms. For example, Fernandes and Ferreira (2008) find that cross-listing improves price informativeness for developed market firms but reduces price informativeness for emerging market firms. They attribute the reduced price informativeness for emerging market firms to the fact that private information collection for these firms is crowded out by increased disclosure and exchange rules in the U.S.

H_{2a}: *Firms that cross-list their stocks in the U.S. have better earnings quality than the home-country firms that are not cross-listed.*

To examine this issue in more detail, a time dimension is added to the study by examining whether cross-listing firms' earnings management behaviour changes before and after the enactment of SOX. It is expected that significant changes in earnings management patterns have taken place in the U.S. as a result of SOX (DeFond and Francis 2005; Cohen, Dey, and Lys 2008). No exception was made for cross-listing firms as SOX provisions cover all SEC reporting companies.[53] Accepting the argument that SOX provisions, especially SOX Section 404, improve the effectiveness of cross-listing firms' corporate governance functions in monitoring the quality of accounting earnings, firms that cross-list their stocks in the U.S. are expected to have better earnings quality in the post-SOX era than in the pre-SOX era. Therefore, the second part of Hypothesis 2 is:

H_{2b}: *The difference in earnings quality between the cross-listing firms and their home-country counterparts is greater in the post-SOX period than in the pre-SOX period.*

[53] Companies with Level I and Level IV ADRs are the exceptions as they do not face the SEC reporting requirements.

Regarding earnings quality of firms cross-listed in the U.K., no prior studies have compared cross-listing firms in the U.K. with a matched sample of home-country firms which are not cross-listed. However, as discussed before, earnings quality of cross-listing firms varies when the comparison benchmark changes. It would be of regulators', researchers' and investors' interest to know the extent to which earnings quality has or has not been improved by cross-listing on the London Stock Exchange. Baker et al. (2002) perform a test of Merton's investor recognition hypothesis and show that firms cross-listing their shares on the NYSE or the London Stock Exchange experience a significant increase in visibility as measured by analyst coverage and print media attention. The increase in public scrutiny and more stringent investor protection can serve as a bonding mechanism to improve corporate governance and earnings quality.

Roosenboom and Dijk (2009) find that financial markets react positively to cross-listing announcements for cross-listing on the London Stock Exchange and on the U.S. exchanges, while significant announcement returns are not observed for cross-listings on exchanges in continental Europe or the Tokyo Stock Exchange. Similarly, Baker et al. (2002) find a significant increase in visibility when foreign firms cross-list on both the NYSE and the London Stock Exchange, but the results are stronger for the NYSE listing firms. The literature suggests that an important reason for London as a popular cross-listing destination is the stringent regulatory requirements imposed on the U.S. markets after SOX. Despite the academic debate over the relative merits of rules-based and principles-based accounting standards, the U.S. markets do impose higher reporting and disclosure requirements in terms of quantity, quality, and frequency.[54] Therefore, it is reasonable to predict that earnings quality of firms that cross-list in the U.K. is on average better than their home-country firms that do not cross-list their stocks. However, since the disclosure requirements and public scrutiny in the U.K. are not as stringent as those in the U.S., the difference in earnings quality might not be as obvious as in the case of cross-listing in the U.S. Based on the discussion, two hypotheses are formed below:

H_{2c}: *Firms that cross-list their stocks in the U.K. have better earnings quality than their home-country counterparts that are not cross-listed.*

H_{2d}: *The difference in earnings quality between the cross-listing firms and their home-country counterparts is greater when the firms are cross-listed in the U.S. than when the firms are cross-listed in the U.K.*

[54] The "principles-based" standards are often associated with IFRS and the "rules-based" standards are often associated with the Financial Accounting Standards Board's (FASB) standards even though the distinction between rules-based and principles-based standards has been over-played in many cases (Bennett, Bradbury, and Prangnell 2006).

3.4 Is Earnings Quality Different for Firm that Cross-list on the U.S. and U.K. Markets?

Chapter 2 identifies two prevailing explanations to the increasing popularity of London's Main Market and AIM as the markets for cross-listing. On one side, researchers and practitioners express their concerns that London might replace the U.S. as the new global financial centre after SOX. On the other side, London's Main Market might have just absorbed firms "screened out" by the U.S. markets. Studies on the U.S. disclosure requirements for foreign firms almost unanimously agree that the stringent U.S. reporting standards and regulatory restrictions are important reasons why many foreign firms opt to cross-list in the U.K. and the Far East rather than the U.S. (Biddle and Saudagaran 1992; Doidge et al. 2009a).

A growing number of studies lend support to the "screen out" explanation by documenting the differential characteristics of cross-listing firms and differential disclosure requirements for U.S. and U.K. cross-listings. As documented by Piotroski and Srinivasan (2008), cross-listing firms in London's Main Market are usually domiciled in countries with weak investor protection and low economic development. Doidge et al. (2009a) believe that a significant premium for U.S. cross-listing still exists for foreign firms, and the observed switch to the U.K. markets is explained by changes in firm characteristics instead of by changes in the benefits of cross-listing.

The special case of the AIM is also worth pointing out as the AIM is an exchange regulated market segment.[55] The self-regulatory approach taken by the AIM enables it to escape most of the mandatory provisions of the EU law and rules applicable to firms listed on London's Main Market. Consistent with the "screen out" explanation, Gerakos, Lang, and Maffett (2013) find that firms listed on the AIM experience stock underperformance, low liquidity, information asymmetry and high failure rates compared to firms listed on the regulated exchanges in the U.S. and the U.K.

In Coffee's (1999) discussion of cross-listing as a bonding mechanism, firms' motivation to opt into higher regulatory or disclosure standards largely stems from the commitment to better governance standards than those of their home countries. In particular, Coffee (1999) mentions both the U.S. and the U.K. as cross-listing destinations that are able to offer such bonding mechanisms. His bonding hypothesis focuses more on a "political theory" of corporate finance where the critical legal protections for the dispersed shareholders are found in the U.S. and U.K. securities laws, especially those provisions regarding corporate control transactions. For example, the U.S. and the U.K. securities laws strictly prohibit insider trading, while some civil law countries such as Germany have not made it a criminal offence.

[55] AIM companies are regulated by AIM Regulation, a team nominated by the London Stock Exchange.

While the bonding hypothesis has won the support of investor protection studies, Licht (2003) questions this claim by arguing that cross-listing on the London Stock Exchange does not involve material changes in disclosure duties on behalf of the issuer or its management. Compared with the U.S. markets, the potential of the U.K. markets as vehicles for piggybacking may not be as strong as Coffee (1999) suggests. Another important point added by Licht (2003) is that the threat of class litigation that exists in the U.S. does not apply in the U.K., even though such threat may only exist "in theory" due to the SEC's reluctance to pursue claims against foreign firms.

The differences in firm characteristics, accounting standards setting procedures, and levels of enforcement together lead to the expectation that firms cross-listed in the U.S. markets have better earnings quality than firms cross-listed in the U.K. markets. Therefore, Hypothesis 3 is:

H_3: *Earnings quality is higher for firms cross-listed on the U.S. markets than for firms cross-listed on the U.K. markets.*

3.5 The Home Country Impacts

As discussed in Chapter 2, the consequences of the current listing standards and disclosure requirements in the U.S. and the U.K. remain a matter for debate. Even if the increased public scrutiny and more stringent investor protection can serve as a bonding mechanism to improve corporate governance and earnings quality, cross-listing firms are likely to have a strong incentive to smooth earnings in periods subsequent to the cross-listing event due to the potentially high political costs and high probability of government intervention in cases of large losses (Lang et al. 2006). Managers' incentive to smooth earnings also originates from the continued listing standards imposed by stock exchanges. For example, NASDAQ requires cross-listing firms to maintain a minimum level of $US 50 million total assets and total revenues in the latest fiscal year or in two of the last three fiscal years to be able to continue their listings. The exchanges also keep a close eye on the average market capitalisation and the share price of cross-listing firms.[56] As a result, managers would face incentives to smooth earnings and to avoid losses to please the regulators and investors.

If the pressure for cross-listing firms to smooth earnings exists in general, a question arises as to which firms are more likely to engage in earnings management. A starting point to approach this question is the impact of legal origin and enforcement issues raised in the existing literature. La Porta et al.'s research suggests that cross-country differences in legal origin help explain differences in financial

[56] As an example, Section 802.01 of the NYSE Listed Company Manual states that "the exchange will promptly initiate suspension and delisting procedures" if the average market capitalisation of an entity over 30 consecutive trading days is below $15 million.

development. Beck, Demirguc-Kunt, and Levine (2003) expand La Porta et al.'s legal origin studies by showing that legal origin matters for financial development because legal traditions differ in their ability to adapt efficiently to evolving economic conditions. The evidence provided by Burgstahler, Hail, and Leuz (2006) even suggests that institutional factors are more important than accounting regulations in explaining earnings management.[57] Consistent with this view, Cahan, Emanuel, and Sun (2009) examine the relationship between earnings quality and value relevance, and they find that the association between these two variables is stronger in countries with better investor protection and a more transparent information environment.

In a discussion of Lang et al.'s (2006) study, Leuz (2006) suggests that home-country institutions have a significant influence on cross-listing firms' reporting behaviour. Even after the cross-listing event, most cross-listing firms continue to be heavily exposed to their home-country institutions and market forces in the product, labour, and capital markets. The pressure exerted by home-country stakeholders on cross-listing firms creates reporting incentives that are different from firms domiciled in the U.S. or the U.K. For example, firms domiciled in code-law countries typically have a stakeholder governance model where conservative and risk-averse stakeholders

[57] In Burgstahler et al.'s (2006) study, privately held EU firms are compared to publicly traded EU firms because they have the same legal form and face the same accounting standards. They find that private firms exhibit higher levels of earnings management than public firms, but strong legal systems reduce earnings management in both private and public firms.

such as banks and employees are represented on corporate boards (Ball et al. 2000). To meet these stakeholders' low-risk preference, managers have the incentive to smooth earnings.

Although firms are exposed to a more stringent disclosure environment after cross-listing on the U.S. or the U.K. markets, La Porta et al. (2000) argue that U.S. enforcement and minority rights protection are not an effective replacement for strong investor protection in the cross-listing firm's home country. As discussed in Section 2.6.2, there is a regulatory mismatch due to issues of jurisdiction and priorities, and cross-listing firms are still subject to home-country company law (MacNeil 2011). These findings make a strong point that where cross-listing firms come from does matter. It is therefore reasonable to expect that home-country institutions are important in explaining cross-listing firms' earnings quality, and the first part of Hypothesis 4 is:

H_{4a}: *Earnings quality is higher for cross-listing firms from home countries with stronger investor protection and legal enforcement than for cross-listing firms from home countries with weaker investor protection and legal enforcement.*

It can be argued that Hypothesis 4a would likely apply regardless of whether firms seek to cross-list. Therefore, it is important to know the role played by the cross-listing activities. If the bonding hypothesis holds, the greatest improvements in earnings quality should take place where investor protection is the weakest.

As indicated in Section 2.5.5 of Chapter 2, a recent change in the SEC reconciliation regulation is that, from March 2008, foreign private issuers who prepare their financial statements in accordance with IFRS as issued by the IASB are no longer required to reconcile their earnings with U.S. GAAP by filing Form 20-F. In particular, the SEC comments that IFRS as "a single set of high-quality globally accepted accounting standards" could help investors to understand investment opportunities outside the U.S. more clearly.[58] This implies that the SEC considers IFRS to have greater comparability than a multiplicity of foreign national accounting standards. Accepting this view, there is a larger earnings quality gap between U.S. GAAP and a multiplicity of foreign national accounting standards. Cross-listing firms that have previously adopted some national accounting standards other than IFRS are therefore expected to experience greater improvements in earnings quality by either reconciling their earnings with U.S. GAAP or adopting IFRS.

Renders and Gaeremynck (2007) report that, in addition to firm-specific benefits, countries with stronger investor protection laws and corporate governance codes are

[58] This comment is included in the SEC's announcement of "acceptance from foreign private issuers of financial statements prepared in accordance with international financial reporting standards without reconciliation to U.S. GAAP", available at http://www.sec.gov/rules/final/2007/33-8879.pdf

more likely to have made early adoptions to IFRS as the loss of insiders' private benefits tend to be small. Consequently, if the SEC's acceptance of IFRS as a sufficient substitute to U.S. GAAP could effectively stimulate cross-listing firms' IFRS adoption, the impact is expected to be greater on cross-listing firms from countries with weaker investor protection laws and legal enforcement as many of them have not adopted the IFRS. Based on these expectations, the second part of Hypothesis 4 is:

H_{4b}: *Improvement in earnings quality is greater for cross-listing firms from home countries with weaker investor protection and legal enforcement.*

3.6 Summary

This chapter develops four sets of hypotheses to investigate how firms' cross-listing choices are related to their earnings quality. The argument is presented that managers simultaneously consider the benefits and costs produced by opting into a more stringent form of regulatory environment. Motivated by the significant benefits of cross-listing on the U.S. and the U.K. markets, firms may manage earnings upward before they cross-list to meet regulatory thresholds and to enhance accounting numbers shown in the prospectus (Hypotheses 1a and 1b). IPO firms have stronger incentives than non-IPO firms to manipulate earnings as they are more concerned about stock prices at the time of cross-listing, but IPO firms face stricter reporting regulations that limit their ability to manage earnings. Therefore, IPO firms and non-IPO firms may or may not engage in the same level of earnings management prior to the cross-listing event (Hypothesis 1c).

Based on the bonding hypothesis, cross-listing firms are more likely to commit themselves to better governance practices and disclosure relative to non-cross-listing firms. This leads to the expectation that cross-listing firms have better earnings quality than their home-country counterparts, and the difference is greater in the U.S. than in the U.K (Hypotheses 2a, 2c, and 2d). The passage of SOX applies to foreign issuers and therefore firms cross-listed in the U.S. are expected to have better earnings quality in the post-SOX era (Hypothesis 2b).

Compared to the stringent disclosure requirements and public scrutiny in the U.S. markets, the bonding mechanism in the U.K. markets is not as strong. Therefore, earnings quality is expected to be higher for firms cross-listed on the U.S. markets than firms cross-listed on the U.K. markets (Hypothesis 3).

Regarding the impacts of home-country institutions, earnings quality is hypothesised to be higher for cross-listing firms from home countries with stronger investor protection and legal enforcement (Hypothesis 4a), but the greatest improvements in earnings quality should come from firms domiciled in countries with weak investor protection and legal enforcement (Hypothesis 4b). For ease of reference, all the hypotheses are shown in Table 3.1 below.

The research designs and models used to test the four sets of hypotheses are presented in the next chapter. The discussion includes a review of the research designs used in prior studies, definitions of variable, and the construction of regression models.

Table 3.1

Summary of Hypotheses

Hypothesis	Independent variable of Interest
Earnings management at the time of cross-listing	
H_{1a}: Cross-listing firms manage earnings upward in the period surrounding cross-listing on the U.S. markets.	Year of cross-listing
H_{1b}: Cross-listing firms manage earnings upward in the period surrounding cross-listing on the U.K. markets.	Year of cross-listing
H_{1c}: IPO firms and non-IPO firms engage in the same level of earnings management in the period immediately before the cross-listing events.	IPO
Differences in earnings quality by cross-listing on the U.S. and/or the U.K. markets	
H_{2a}: Firms that cross-list their stocks in the U.S. have better earnings quality than the home-country firms that are not cross-listed.	Whether or not cross-listing

Table 3.1 (*continued*)

Hypothesis	Independent variable of Interest
$H_{2b:}$ The difference in earnings quality between the cross-listing firms and their home-country counterparts is greater in the post-SOX period than in the pre-SOX period.	Whether or not cross-listing and SOX
H_{2c}: Firms that cross-list their stocks in the U.K. have better earnings quality than their home-country counterparts that are not cross-listed.	Whether or not cross-listing
$H_{2d:}$ The difference in earnings quality between the cross-listing firms and their home-country counterparts is greater when the firms are cross-listed in the U.S. than when the firms are cross-listed in the U.K.	Whether or not cross-listing and the cross-listing destination
Differences in earnings quality between firms cross-listed in the U.S. and the U.K.	
H_3: Earnings quality is higher for firms cross-listed on the U.S. markets than firms that cross-listed on the U.K. markets.	The cross-listing destination
The home country impacts	
$H_{4a:}$ Earnings quality is higher for cross-listing firms from home countries with stronger investor protection and legal enforcement than cross-listing firms from home countries with weaker investor protection and legal enforcement.	Home country institutions
H_{4b}: Improvement in earnings quality is greater for cross-listing firms from home countries with weaker investor protection and legal enforcement.	Home country institutions and cross-listing status

CHAPTER 4

RESEARCH METHODOLOGY

4.1 Introduction

This chapter presents the research designs and models used to test the hypotheses developed in Chapter 3. It begins with a brief review of the research designs and frameworks used by prior cross-listing studies in Section 4.2. This is followed by a discussion of how the main variables (i.e. the earnings quality metrics) and control variables are defined and measured in Section 4.3 and Section 4.4 respectively.[59] Section 4.5 outlines the regression models constructed for testing the hypotheses. Section 4.6 summarises this chapter.

4.2 Research Designs and Frameworks used by Prior Studies

The question of whether cross-listing firms report high-quality accounting numbers has been addressed by researchers from (at least) three perspectives. First, although firms' decision to cross-list on a foreign stock exchange is not directly linked to their reporting choices, the bonding hypothesis argues that firms from countries

[59] Although different regression models are constructed for hypothesis testing, all the main multivariate models use the earnings quality measures as the dependent variable. For the clarity of the thesis, Section 4.3 is devoted to provide a detailed discussion of the earnings quality metrics used.

with weak legal institutions use cross-listing on the U.S. markets as a mechanism to strengthen investor protection and to reassure outside investors (Coffee 1999; Stulz 1999). This gives rise to the argument that cross-listing firms are less aggressive in terms of earnings management compared to home country firms that are not cross-listed (Lang et al. 2003a).

Second, researchers claim that the cross-listing firms are more aggressive in terms of earnings management compared to U.S. domestic firms (Lang et al. 2006). In other words, just because cross-listing firms have higher quality accounting data than their home country counterparts does not mean their reported earnings are comparable to those of the domestic U.S. firms. The U.S. reporting requirements for cross-listing firms are less onerous, and the U.S. SEC also shows a clear intention to further ease the reporting burden borne by cross-listing firms.[60] The difference in reporting requirements, in addition to the difference in reporting incentives, creates the observed difference in earnings management behaviours.[61]

Third, if the cross-listing event per se is important in determining firms' earnings quality and firms' engagement in earnings management behaviours, firms can be

[60] For example, having considered extensive public comments on foreign companies' filing requirements, the U.S. SEC unanimously approved to accept financial statements of cross-listing firms prepared using IFRS without reconciliation of earnings to U.S. GAAP in 2007.

[61] The difference in enforcement and litigation environment is an example of the factors contributing to the different reporting incentives. In Section 2.6.2 of Chapter 2, it has been discussed that the enforcement and litigation environment is much stronger for U.S. domestic firms than for firms cross-listed on the U.S. markets. This is largely due to the fact that the regulatory forces in practice are often reluctant to pursue claims against foreign firms (Siegel 2005).

partitioned into the pre- and post-cross-listing periods. This research design effectively uses each firm as its own control, and the advantage is that the test sample and the control sample are expected to be similar along most other dimensions of firm characteristics.

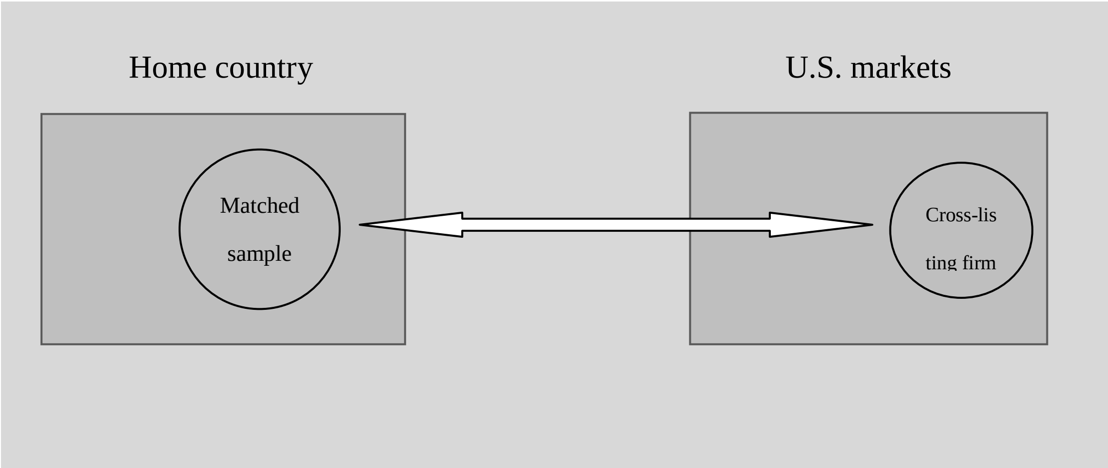
To sum up, the different research perspectives discussed above use three different benchmarks for comparison. These three types of comparison are illustrated in Figures 4.1, 4.2, and 4.3 below.

As shown in Figure 4.1, the first stream of studies compares foreign firms listed on the U.S. markets with a matched sample of non-cross-listing firms in their home country. The goal of matching is, for every cross-listing firm, to find one non-cross-listing firm with similar characteristics against whom the effect of cross-listing on the U.S. markets can be assessed. For example, Lang et al.'s (2003a) study matches cross-listing firms with non-cross-listing firms on home country, industry group, year, and the eligibility to cross-list on the U.S. market (but choose not to do so). This matching procedure addresses the concern that the cross-listing choice is not randomly assigned and thereby should not be treated as exogenous.

Figure 4.1

Foreign Firms Listed on the U.S. Markets vs. a Matched Sample of

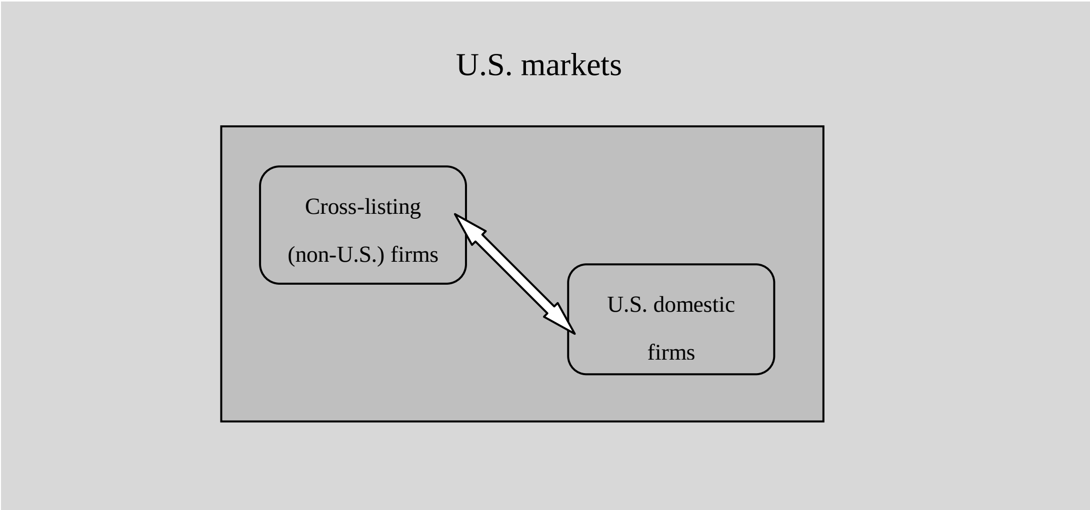
Non-cross-listing Firms in their Home Country



The second research perspective compares non-U.S. firms listed on the U.S. markets with domestic U.S. firms listed on the U.S. markets (Figure 4.2). To address this issue, Lang et al. (2006) take a similar approach as in Lang et al. (2003a) to match cross-listing firms with a sample of U.S. firms on year, industry, and growth. An improvement from their 2003 study is the consideration of several factors that are purported to affect earnings management behaviours at the country level. For example, when the whole cross-listing sample is partitioned into a subsample with high investor protection and a subsample with low investor protection, the gap between the latter and U.S. domestic firms is found to be larger for most of the earnings management measures.

Figure 4.2

Non-U.S. Firms Listed on the U.S. Markets vs. U.S. Domestic Firms Listed on the U.S. Markets

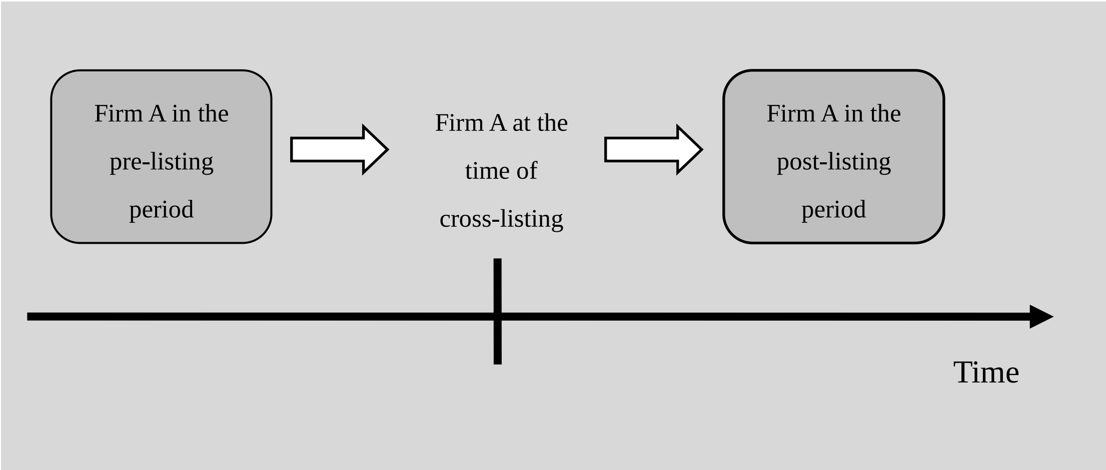


The third research perspective investigates firms' earnings management behaviours surrounding the cross-listing event. For example, Ndubizu (2007) compares firms' discretionary accruals in the year of cross-listing with the discretionary accruals in the pre- and post-listing periods (Figure 4.3). This research design uses a cross-listing firm as its own control, which avoids biases that are likely to arise in the selection of the control sample.[62]

[62] Selection bias is often significant in studies using the matching procedure to construct the control sample. However, it should be noted that the matching procedures can help to identify firms' incentives to cross-list as some extraneous factors are difficult to control for when using the firm as its own control.

Figure 4.3

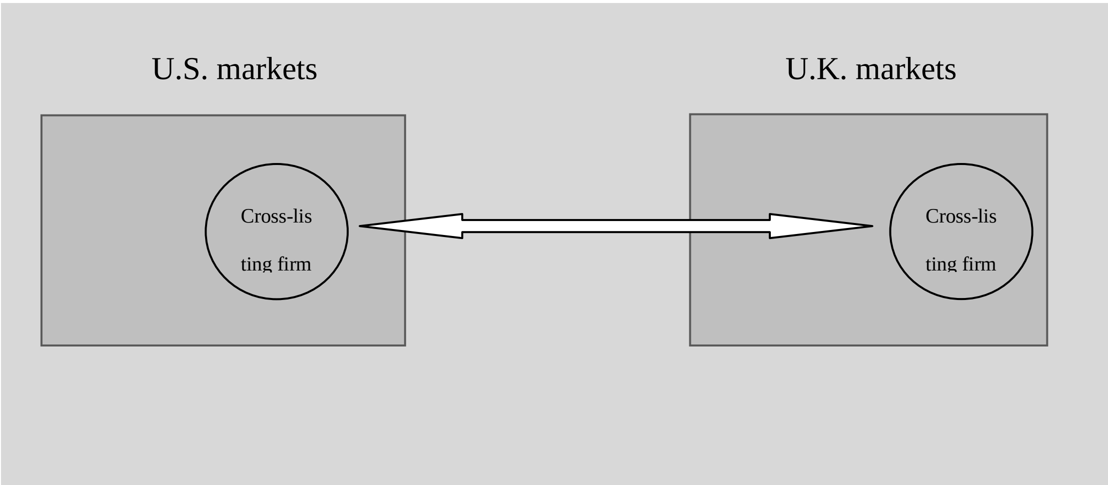
Use a Cross-listing Firm as its Own Control



This thesis seeks to extend the perspectives from which cross-listing firms' earnings management behaviours are understood. As shown in Figure 4.4, this involves a direct comparison between firms cross-listed on the U.S. and the U.K. markets. A comparison of different cross-listing destinations is important because firms have a wide range of competing alternatives to choose from. Why they choose to cross-list on certain markets and not the others is a good indicator of the relative costs and benefits of the cross-listing destinations (Zingales 2007). In a recent study conducted by Gerakos et al. (2013), a direct comparison is made between companies listing on the AIM and companies listing on the regulated stock exchanges in the U.S. and the U.K. Stocks trading on the AIM experience stock underperformance and other financial issues compared to stocks trading on the regulated stock exchanges.[63] To the extent that both the U.S. and the U.K. markets provide better protections for minority shareholders than do cross-listing firms' home countries, a direct comparison between firms cross-listed on the U.S. and the U.K. markets provides important implications for the relative strengths and efficiencies of the legal bonding mechanism in the two markets.

Figure 4.4

Foreign Firms Cross-listed on the U.S. Markets vs. Foreign Firms Cross-listed on the U.K. Markets



[63] The AIM is a privately-regulated market while the other U.S. and U.K. markets are subject to substantial regulatory oversight. Therefore, the comparison between the AIM and other U.S. and U.K. markets is essentially a comparison between decentralised stock exchange markets and centralised stock exchange markets.

4.3 Earnings Quality Metrics

This thesis considers a variety of earnings quality measures that have been suggested and tested in the prior literature. Dechow et al. (2010) conduct a comprehensive review over 3,000 studies and organise earnings quality measures into three categories: (1) properties of earnings, (2) investor responsiveness to earnings, and (3) external indicators of earnings misstatements.[64] The first category, properties of earnings, includes accounting-based earnings attributes that are used as proxies for earnings management. The second category contains market-based measures that are often used to investigate the relation between earnings quality and the cost of equity (e.g. Francis et al. 2004; Francis, LaFond, Olsson, and Schipper 2005). The third category is based on external oversight and monitoring mechanisms that give indications of earnings misstatement.[65]

The earnings management measures used in this thesis are mainly from Dechow et al.'s (2010) first category of earnings quality proxies, including models of accruals, persistence and predictability, smoothness, and target beating.[66] These accounting-based constructs are considered appropriate for the purpose of this thesis

[64] These studies are from four journals: *Contemporary Accounting Research*, *Journal of Accounting and Economics*, *Journal of Accounting Research*, and *Review of Accounting Studies*.

[65] Examples of the indicators include restatements and internal control procedure deficiencies reported under the SOX (Dechow et al. 2010).

[66] All earnings management variables, other than the indicator variable used to proxy for target beating, are winsorised at the 5^{th} and 95^{th} percentiles to control for potential outliers

because they have been widely used by prior studies as a means to examine earnings quality, despite some concerns over the actual ability of the models to detect earnings management. It can be argued that external indicators of earnings misstatements provide effective measures of aggressive earnings management, but it would be difficult to compare cross-listing firms in the U.S. and the U.K. markets due to the different national regulatory and oversight bodies.[67] The earnings quality metrics are discussed and explained in detail below.

4.3.1 Models of Accruals

In earnings quality studies, the accrual component is one of the most studied aspects of earnings (Dechow et al. 2010). Different from the cash component of earnings, accruals are subject to managers' discretion over accounting choices under GAAP. A large volume of evidence on accruals-based earnings management shows that a variety of accrual constructs can be used to detect earnings management (Jones, Krishnan, and Melendrez 2008).

As in many earnings management studies, a critical methodological issue in examining accruals is to choose a benchmark for what accruals would have been in the absence of earnings management. The information perspective suggests that

[67] External indicators of earnings misstatements are also not considered because a misstatement of earnings is a rare event, especially for the small pool of cross-listing firms.

GAAP allows managers to exercise discretion over accounting choices and choose accruals to enhance the informativeness of accounting earnings. It is the abuse of discretion that captures the concept of earnings management. Therefore, total accruals can be decomposed into the normal and abnormal accruals, where only the abnormal accruals represent a distortion. Starting with Jones (1991), a growing body of earnings management studies attempt to use regression-based accruals models to establish normal accruals and thereby identify discretionary accruals (e.g. Dechow, Sloan, and Sweeney 1995; Kothari, Leone, and Wasley 2005).

In this thesis, the models of accruals used to proxy for earnings management are the modified Jones model (Dechow et al. 1995) and percent accruals (Hafzalla, Lundholm, and Winkle 2011). These two models are discussed below, following a definition of accruals.

4.3.1.1 Total accruals

The importance of analysing the accrual component of reported earnings stems from the empirical evidence that the accrual component has lower persistence compared to the cash flow component (Sloan 1996). As explained by Dechow et al. (2010), there are two contrasting explanations for this result. One explanation attributes the low persistence of the accrual component to the inherent problem with accrual accounting. The discretion allowed by GAAP is a means by which managers can report earnings that better reflect the fundamental performance of firms. For example, Fairfield, Whisenant, and Yohn (2003) provide evidence that both accruals and growth in long-term net operating assets are negatively related to one-year-ahead return on assets, and the stock market responds to them in a similar manner.[68]

A second explanation for the lower persistence of the accrual component is managers' attempts to opportunistically influence earnings perceptions. The study conducted by Richardson, Sloan, Soliman, and Tuna (2006) shows that the lower persistence of accruals is significantly explained by temporary accounting distortions. Extreme accruals are systematically related to SEC enforcement actions after controlling for growth in sales. These results reveal the strong association between lower persistence of accruals and earnings manipulation that investors should be alerted to. In cases of less persistent accruals, if investors "fixate" on total earnings to evaluate firm performance, stock prices would fail to fully reflect concerns about future earnings (Sloan 1996).

Dechow et al. (2010) point out that the definition of accruals has evolved over time and is still changing to reflect the increasingly comprehensive concept of

[68] Accruals and growth in long-term net operating assets can be viewed as two components of total growth in net operating assets (Fairfield et al. 2003).

accruals beyond working capital and depreciation.[69] Measuring total accruals as non-cash working capital and depreciation requires a balance sheet approach that involves calculating the change in successive balance sheet accounts. Hribar and Collins (2002) argue that this approach taken in early research may result in a Type I classification error in the presence of mergers and acquisitions.[70]

Following the commonly employed definition in more recent studies, this research defines total accruals (*TA*) of firm *i* in fiscal year *t* as the difference between net income before extraordinary items (*NIBE*) and cash flows from operations (*CFO*), $TA_{i,t} = NIBE_{i,t} - CFO_{i,t}$.

In addition to being used as the basis to calculate discretionary accruals, total accruals are also treated as one earnings management variable along with other more sophisticated accruals models. This is based on the recent discovery that many other accruals-based earnings management measures fail to provide incremental explanatory power over total accruals (Jones et al. 2008; Dechow, Ge, Larson, and Sloan 2011).[71] The ability of total accruals to detect earnings management is important for this research because there is a trade-off between a simple model of

[69] Intuitively, all balance sheet items other than cash are influenced by accrual basis accounting. A comprehensive measure of accruals should reflect change in net operating assets that is not attributable to the change in cash flow.

[70] That is, an innocent firm may be misclassified into an earnings management firm.

[71] Jones et al. (2008) provide evidence that total accruals have incremental explanatory power over discretionary accruals in explaining small frauds; Dechow et al. (2011) find that total accruals are generally more powerful than discretionary accruals in predicting SEC enforcement actions for alleged earnings misstatement.

accruals with minimal data requirements and a richer model of accruals that requires time-series data. Given the relatively small proportion of cross-listing firms and consequent size of the sample, it is desirable to maximise the sample size without sacrificing the ability of the models to detect earnings management.

4.3.1.2 Discretionary accruals

Consistent with the mainstream earnings management studies, the primary model employed in this research is the discretionary accruals model. Discretionary accruals (*DA*) are obtained using the cross-sectional version of the Jones (1991) model modified by Dechow et al. (1995). To estimate normal accruals (*NA*), I first estimate the following ordinary least squares regression (Equation 4.1) for each two-digit SIC code for each fiscal year in the sample. If an industry has less than 7 observations for a given year, the model is estimated for each one-digit SIC code for each fiscal year instead.[72]

$$\frac{TA_{i,t}}{Assets_{i,t-1}} = \alpha_1 \frac{1}{Assets_{i,t-1}} + \alpha_2 \frac{\Delta REV_{i,t}}{Assets_{i,t-1}} + \alpha_3 \frac{PPE_{i,t}}{Assets_{i,t-1}} + \varepsilon_{i,t} \qquad (4.1)$$

where $TA_{i,t}$ is firm *i*'s total accruals in year *t* as defined in Section 4.3.1.1, $Assets_{i,t-1}$ is firm *i*'s total assets in the preceding year, $\Delta REV_{i,t}$ represents change in revenues from

[72] Cross-listing studies are subject to data constraints. In many cases, data observations are not sufficient for industry classification using the two-digit SIC code.

the previous year, and $PPE_{i,t}$ is the gross value of property, plant and equipment.

Firm-specific normal accruals for the sample firms are calculated by substituting the coefficient estimates obtained from Equation (4.1) into Equation (4.2) as shown below.

$$NA_{i,t} = \hat{\alpha}_{1,t} \frac{1}{Assets_{i,t-1}} + \hat{\alpha}_{2,t} \frac{\Delta REV_{i,t} - \Delta AR_{i,t}}{Assets_{i,t-1}} + \hat{\alpha}_{3,t} \frac{PPE_{i,t}}{Assets_{i,t-1}} \tag{4.2}$$

where $NA_{i,t}$ represents firm-specific normal accruals, $\Delta AR_{i,t}$ is the change in accounts receivable from the preceding year, and all other variables are as defined before. The difference between the modified version of the Jones Model and the original Jones Model is the inclusion of changes in accounts receivable to estimate normal accruals. It is designed to address the concern that managers are likely to exercise discretion over revenue by manipulating credit sales (Dechow et al. 1995). Following this methodology, discretionary accruals is defined as the difference between total accruals and normal accruals, $DA_{i,t} = (TA_{i,t}/Assets_{i,t-1}) - NA_{i,t}$.

The definition of discretionary accruals implicitly assumes that earnings management takes a particular sign, either income-increasing or income-decreasing, in a particular period. This is more appropriate in an analysis of a particular event that is hypothesised to create incentives for upward or downward earnings management.[73]

[73] An example is the IPO event in which cash injection may provide an incentive for IPO firms to boost earnings. This is hypothesised in a cross-listing context in Hypothesis 1c of Chapter 3.

In a more general context without a specific corporate event, many studies also use unsigned discretionary accruals to capture firms' general propensity to manage earnings (e.g. Aboody, Hughes, and Liu 2005; Cohen et al. 2008). Following the previous research, my earnings management metrics also include the absolute value of discretionary accruals (*ABSDA*) to proxy for earnings management.[74]

4.3.1.3 Percent accruals

Percent accruals is a new accrual model advanced by Hafzalla et al. (2011) that is found to be better than the traditional accrual measures in identifying an extreme accrual. Different from traditional accruals which are scaled by total assets, percent accruals are accruals scaled by earnings. Intuitively, this percent accruals measure is a decomposition of earnings by identifying the proportions of earnings that consist of cash flow and accruals respectively. Kang and Sivaramakrishnan (1995) point out that a central issue in earnings management studies is that only the sum of managed and unmanaged accounting numbers is observable, and the variables used to predict non-discretionary accruals are also accounting numbers that are subject to earnings management. Therefore, percent accruals can be seen as a new attempt to predict

[74] Lang et al. (2003a) use *ABSDA* as one of the earnings management measures to compare cross-listing firms and non-cross-listing firms. Non-cross-listing firms are found to have significantly higher median *ABSDA* than cross-listing firms in the U.S.

earnings management, and this seemingly small change in the denominator of accruals measure may produce a unique proxy for earnings management.

In this thesis, percent accruals are included in the earnings quality metrics to provide a different angle to view accruals-based earnings management. Following Hafzalla et al. (2011), the two measures of percent accruals used in this thesis are percent operating accruals (*PEROA*) and percent total accruals (*PERTA*). They are defined as:

$$PEROA_{i,t} = (NI_{i,t} – CFO_{i,t}) / |NI_{i,t}| \tag{4.3}$$

$$PERTA_{\mathrm{i,t}} = (NI_{i,t} – NDV_{i,t} - CHECH_{i,t}) / |NI_{i,t}| \tag{4.4}$$

where $NI_{i,t}$ is net income, $NDV_{i,t}$ is net dividends, $CHECH_{i,t}$ is change in cash balance, and all other variables are as defined before.[75] Consistent with Richardson, Sloan, and Tuna (2005b), net dividends are computed as cash dividends (*DV*) plus stock purchases (*PRSTKC*) less equity issuances (*SSTK*), $NDV_{i,t} = DV_{i,t} + PRSTKC_{i,t} - SSTK_{i,t}$. Change in cash balance (*CHECH*) is computed as the sum of net cash flows from operating (*CFO*), investing (*CFI*), and financing activities (*CFF*), $CHECH_{i,t} = CFO_{i,t} + CFI_{i,t} + CFF_{i,t}$.

[75] It should be noted that Hafzalla et al.'s (2011) definition of operating accruals is consistent with the definition of total accruals (*TA*) used in Section 4.3.1.1 of the thesis, while their definition of total accruals follows a comprehensive measure of accruals introduced by Richardson et al. (2005b). While I am aware of the possible confusion that might be induced in labelling the different accrual measures, I choose to follow the terms used by Hafzalla et al. (2011) in defining percent accruals in order to maintain consistency with prior research.

Hafzalla et al. (2011) argue that percent accruals measures have several advantages. First, they are not disproportionately sensitive to special items, and they are robust when applying to firms with losses. Second, percent accruals are effective in selecting firms with extreme differences between sophisticated and naive forecasts. If cross-listing firms' primary incentive for earnings management is to mislead investors and to influence stock prices, especially if managers believe naive investors dominate the market, percent accruals may be a potentially effective measure to detect such earnings management behaviours.

4.3.2 Earnings Persistence and Predictability

4.3.2.1 Earnings persistence

The existing literature views earnings persistence as a desirable earnings attribute for the reason that more persistent earnings reduces uncertainty about firms' future earnings (Francis et al. 2004). It captures the concept of sustainable earnings that are recurring and therefore value relevant. If the current earnings is temporarily depressed or inflated by managers' accounting choices, it cannot be a good indicator of future earnings.

Dechow et al. (2010) point out that the vast majority of studies in this area focus on the stock market consequences of having high or low earnings persistence. In which cases, earnings persistence is used as an explanatory variable to predict the stock price response. Early research believes that analysts and sophisticated investors value firms with more persistent earnings, which will yield a higher equity market valuation and therefore positive contemporaneous equity market returns (e.g. Easton and Zmijewski 1989; Penman and Zhang 2002). A recent cross-listing study conducted by Kang et al. (2012) also uses earnings persistence to examine the accounting impact of eliminating the 20-F reconciliation requirement for firms cross-listed in the U.S.

While earnings persistence is widely used in the accounting literature as a proxy for earnings quality, the relationship between earnings persistence and earnings management, however, is not always clear. On the one hand, less persistent earnings may be indicative of accruals-based earnings management to the extent that extreme accruals are likely to be corrected or reversed in future periods, resulting in reduced earnings persistence (Dechow et al. 2010).[76] On the other hand, the positive responses of the stock market to high earnings persistence may create incentives for firms to opportunistically manage earnings to achieve persistence in the short run (Barton, Hansen, and Pownall 2010). Nevertheless, the earnings persistence measure

[76] Accruals do not necessarily reverse in the year immediately after the earnings management year. Richardson et al. (2005b) document that accruals relating to non-current assets and liabilities may take many periods to reverse.

can supplement other earnings quality metrics used in this thesis and is expected to provide a valuable additional perspective.

Following previous research (e.g. Lev 1983; Ali and Zarowin 1992; Francis et al. 2004), earnings persistence (*PERSISTENCE*) is proxied by the slope coefficient that measures the strength of the linear association between current earnings and earnings in the period immediately before the earnings period. This can be expressed in the first-order autoregressive model below:

$$E_{i,t} = \delta_{0,i} + \delta_{1,i} E_{i,t-1} + \varepsilon_{i,t} \tag{4.5}$$

where E is firm i's net income before extraordinary items (*NIBE*) scaled by total assets in year t. Equation (4.5) is estimated using a rolling seven-year window period for each firm.[77] The rolling window regression produces a slope coefficient, δ_1, that is both firm-specific and year-specific. Values of δ_1 close to 1 indicate a more persistent earnings stream, while values of δ_1 closer to 0 indicate a higher transitory earnings stream.

4.3.2.2 Earnings predictability

The concept of persistence can be further developed by considering the notion of

[77] Some studies (e.g. Francis et al. 2004) use a rolling ten-year window to run the regression, which would require at least 10 years of time-series data for each firm in the sample. This thesis acknowledges the possible sensitivity of the results to the selection of window periods, but the seven-year window period is chosen due to the data constraints.

predictability. High predictability is generally seen as desirable by standard setters as outlined in the FASB's (1980) Conceptual Framework. Early empirical evidence also reveals a strong association between earnings predictability and the returns-earnings relation (Lipe 1990). More recent studies such as Francis et al. (2004), Dichev and Tang (2009), and Barton et al. (2010) are also interested in the consequences of predictability and how predictability can be improved.

Following previous research, the autoregressive regressions of earnings (i.e. Equation 4.5) can be extended to examine the ability of earnings to predict itself. In this thesis, two earnings predictability measures are used.

Based on Lipe (1990) and Francis et al. (2004), the first measure of predictability (*PREDICT1*) is the square root of error variance in Equation (4.5), *PREDICT1* $=\sqrt{\sigma^2(\hat{\varepsilon}_{i,t})}$. It captures the variation in current earnings remaining after taking into account the predictive effect of the slope coefficient, δ_1. Therefore, a large value of *PREDICT1* indicates less predictable earnings and vice versa.

Based on Barton et al. (2010), a second measure of predictability (*PREDICT2*) is the adjusted R^2 obtained from the same regression shown in Equation (4.5). The coefficient of determination, R^2, can be expressed as $R^2 = 1-(\sigma^2(\hat{\varepsilon}_{i,t})/\sigma^2(E_{i,t}))$. Similar in spirit to *PREDICT1*, *PREDICT2* indicates the variability of current earnings that can be explained or predicted by the variability of earnings in the preceding fiscal year.[78] A large value of *PREDICT2* indicates more predictable earnings and vice versa.

4.3.3 Smoothness

A large number of prior studies argue that smoothness is a desirable earnings attribute if transitory cash flows as opposed to permanent changes in cash flows are smoothed (e.g. Ronen and Sadan 1981; Demski 1998). If managers use accruals to buffer transitory cash flow shocks based on their private information about future income, earnings persistence is expected to be improved. In contrast, managers may use their accounting discretion to hide permanent changes in cash flow, reducing the informativeness and timeliness of earnings (Leuz, Nanda, and Wysocki 2003).

The contradicting explanations of income smoothing create difficulties in using smoothness as a proxy for earnings management, especially since it is difficult to disentangle managers' different incentives to smooth earnings. The approach taken by Lang et al. (2003a) and Lang et al. (2006) is to treat earnings smoothing as a type of earnings management in the cross-listing context. This view is consistent with the evidence provided by Leuz et al. (2003) that earnings smoothing is more pronounced

[78] The use of an adjusted R^2 is intended to correct for the phenomenon of spurious increase in R^2 when additional independent variables are added to a multiple regression model. This should raise no concern for Equation (4.5) because a simple linear regression is used. However, an adjusted R^2 instead of a R^2 is used to maintain consistency with prior research.

outside the U.S. and in code law countries.

This thesis follows Francis et al. (2004) and Dechow et al. (2010) in using the ratio of income variability to cash flow variability as the measure of smoothness. In particular, smoothness is defined as the standard deviation of firm *i*'s net income before extraordinary items divided by the standard deviation of firm *i*'s cash flows from operations, both of which are scaled by beginning total assets. This can be written as $SMOOTHNESS = \sigma(\frac{NIBE_{i,t}}{Assets_{i,t-1}})/\sigma(\frac{CFO_{i,t}}{Assets_{i,t-1}})$, where standard deviations are computed using a rolling seven-year window period for each firm to yield parameters that are both firm-specific and year-specific.[79] Since this measure uses cash flows as the reference construct of unsmoothed earnings, a large value of *SMOOTHNESS* implies less smoothing of the earnings stream relative to cash flows, and vice versa.

4.3.4 Target Beating

The last measure of earnings quality used in this thesis is firms' tendency to avoid reporting losses by intentionally managing earnings to report small profits. This conjecture is supported by the empirical evidence documented by Hayn (1995),

[79] One of the smoothness measures used in Lang et al.'s (2003a) study is the ratio of the variance of the change in operating profit to the variance of the change in net operating cash flows. It is similar in spirit to the measure used by Francis et al. (2004) in that cash flows are used as the reference construct for unsmoothed earnings.

Burgstahler and Dichev (1997), and many other researchers that there is a "kink" in the distribution of earnings around zero. That is, too few firms report small losses and too many firms report small profits, and the difference is statistically significant. In the earnings management literature, this tendency to avoid small losses is often used to indicate earnings management.

While this construct is intuitively appealing, it may be subject to Type I error since it cannot effectively separate firms that report small profits by chance and firms that opportunistically manage earnings to avoid losses. Dechow, Richardson, and Tuna (2003) show that boosting of discretionary accruals fails to explain this kink, while there are many other alternative explanations such as the selection bias introduced by exchange listing requirements and different valuation methods applied to profit versus loss firms.

Despite criticisms of this approach, this thesis includes small loss avoidance as an additional measure of earnings management because there is a substantial variation in the small loss avoidance measure across different countries (Leuz et al. 2003). Previous cross-listing studies (e.g. Lang et al. 2003a; Lang et al. 2006) using small loss avoidance measures also report statistically significant results.

Consistent with Lang et al. (2006), small loss avoidance is measured by firm *i*'s net income (*NI*) scaled by its total assets, $NI_{i,t} / Assets_{i,t}$. Small loss avoidance (*SLA*) is an indicator variable set to 1 if net income scaled by total assets is between 0 and 0.01 and 0 otherwise. This can be expressed as:

$$SLA = \begin{cases} 0 \;\; if \frac{NI_{i,t}}{Assets_{i,t}} < 0 \; or \; \frac{NI_{i,t}}{Assets_{i,t}} > 0.01 \\ 1 \;\; if \; 0 \leq \frac{NI_{i,t}}{Assets_{i,t}} \leq 0.01 \end{cases}$$

4.4 Control Variables for Earnings Management

A general problem with the earnings quality metrics used in this research is that some measures are innate, that is they arise from a firm's fundamental business model rather than from intentional earnings manipulation. Therefore, it is important to control for innate determinants of earnings quality to mitigate model misspecification as a result of correlated omitted variables. In this thesis I include the following control variables to improve the internal validity of the tests.[80]

Firm size (*SIZE*) is measured by the natural log of the book value of total assets, $SIZE_{i,t} = ln\ (Assets_{i,t})$. Ecker, Francis, Olsson, and Schipper (2013) argue that firm size is as important as industry membership for the selection of peer firms in the cross-sectional accruals models.[81] They observe lower non-discretionary accruals for larger firms because they face limited growth prospects. Therefore, it is important to

[80] All control variables are winsorised at the 5^{th} and 95^{th} percentiles to control for potential outliers.
[81] Ecker et al. (2013) use four measures of firm size: (1) assets, (2) sales, (3) market capitalisation, and (4) firm age. They find that asset peers perform as well as industry at detecting earnings management. Accruals models such as the modified Jones model used in this thesis employ firms in the same industry as the peer set to estimate normal accruals.

control for firm size when comparing the level of earnings management between firms cross-listed on the U.S. markets and firms cross-listed on the U.K. markets because the latter tends to have smaller firm size.

Growth (*GROWTH*) is defined as percentage change in sales (*SALES*), which can be expressed as $GROWTH_{i,t} = (SALES_{i,t} - SALES_{i,t-1}) / SALES_{i,t-1}$. Prior studies find it difficult to disentangle the impacts of accounting choices from growth-related factors in explaining the changes of accruals (Fairfield et al. 2003; Anderson and Garcia-Feijoo 2006). In particular, the lower persistence of the accrual component of earnings may be explained by increases in real investment with decreasing rates of return.[82] It is important to control for growth in this research because firms cross-listed on the U.S. markets and firms cross-listed on the U.K. markets are likely to have different growth rates.

Equity issuance (*SSTK*) is the sales of common and preferred stock.[83] Dechow and Skinner (2000) argue that equity issuance provides a direct incentive to manage earnings if doing so can help firms to improve the terms of share offerings. Evidence shows that cross-listings in the U.S. are associated with more equity issues than cross-listings in Europe (Pagano, Roell, and Zehner 2002). Therefore, equity issuance

[82] Fairfield et al. (2003) suggest diminishing marginal returns as the economic reason for the lower rates of return.

[83] Equity issuance (*SSTK*) has been introduced in Section 4.3.1.3 when defining percent accruals.

is included as a control variable to proxy for the stronger incentives to manage earnings when new shares are issued.

Financial leverage (*LEV*) is defined as total liabilities (*LT*) as a proportion of total assets, $LEV_{i,t} = LT_{i,t} / Assets_{i,t}$.[84] Studies on debt covenants find that high leverage is associated with closeness to the violation of debt covenants (Press and Weintrop 1990), which creates a strong incentive to make income-increasing discretionary accruals (DeFond and Jiambalvo 1994). It is important to control for leverage in this research because measures of earnings management are mainly based on accruals models.

Return on assets (*ROA*) is defined as earnings before interest and taxes (*EBIT*) divided by total assets, $ROA_{i,t} = EBIT_{i,t} / Assets_{i,t}$. Dechow et al. (2010) point out that earnings attributes, including those used to proxy for earnings management, are closely related to the firm's fundamental performance. The discretionary accrual models may be misspecified without considering the impact of performance (Dechow et al. 1995; Kothari et al. 2005).[85]

[84] Pagano et al. (2002) and Lang et al. (2006) both use total liabilities as the numerator of the leverage measure.

[85] To address concerns associated with performance, the performance-adjusted discretionary accruals proposed by Kothari et al.'s (2005) is increasingly used in the earnings management literature. The idea is to add performance measures (e.g. ROA) to the right hand side of the modified Jones model (Equations 4.1 and 4.2). In this thesis, because multiple EM measures are used, ROA is controlled for in the main regressions to maintain consistency in the way that control variables are used.

4.5 Multivariate Models for Hypothesis Testing

This section explains regression models used for testing the hypotheses developed in Chapter 3. The earnings quality metrics discussed in Section 4.3 are used as the dependent variables and the control variables discussed in Section 4.4 are included as right-hand-side variables in the equations.

4.5.1 Hypothesis 1: Earnings Management at the Time of Cross-listing

Hypothesis 1a (H_{1a}) and Hypothesis 1b (H_{1b}) predict that cross-listing firms manage earnings upwards in the period surrounding cross-listing.[86] To test these two hypotheses, I use the cross-listing firm in the pre- and post-listing periods as its own control, with an event window spanning from year -2 to year 2.[87] The model is presented as:

$$EM_{i,t} = \beta_0 + \beta_1 CLY_{i,t} + \sum_{k=2}^{n} \beta_k Controls_k + \varepsilon_{i,t} \tag{4.6}$$

where the dependent variable $EM_{i,t}$ represents the measures of accruals-based earnings management and target beating as specified in Section 4.3, $CLY_{i,t}$ is an indicator variable that equals to 1 for firms in the year of cross-listing and 0 otherwise, $Controls_k$ are the control variables specified in Section 4.4 that may affect the level of

[86] The pioneer empirical test conducted by Ndubizu (2007) investigates earnings management before the cross-listings event based on U.S. data from 1985 to 2003.

[87] That is, two years before the year of cross-listing and two years after the year of cross-listing. The year of cross-listing is labelled "year 0".

earnings management at the firm level, and $\varepsilon_{i,t}$ is the error term.[88] The time-series properties of earnings are not included in the $EM_{i,t}$ metrics for this particular hypothesis because upward earnings management in a particular period is often measured by the models of accruals.[89]

β_1, the coefficient of the dummy variable $CLY_{i,t}$, is a differential intercept coefficient that shows the difference in earnings management between firms in the year of cross-listing and firms in other years. Using only the sample of firms cross-listed in the U.S. to run the regression model (Equation 4.6), support for H_{1a} exists if β_1 is positive and significantly different from zero. The null and alternative hypotheses can be written as:

H^0_{1a}: $\beta_1 = 0$, H^1_{1a}: $\beta_1 > 0$

Using only the sample of firms cross-listed in the U.K. to run the regression model (Equation 4.6), support for H_{1b} exists if β_1 is positive and significantly different from zero. The null and alternative hypotheses can be written as:

H^0_{1b}: $\beta_1 = 0$, H^1_{1b}: $\beta_1 > 0$

88 Accruals-based earnings management measures used in this thesis include total accruals, discretionary accruals, and percent accruals.

89 Times-series properties of earnings in this thesis refer to earnings persistence, predictability, and smoothness. Boosting of discretionary accruals to exceed the cross-listing thresholds and/or to enhance earnings are possible explanations of upward earnings management immediately before cross-listing. Manipulating accruals to exceed thresholds is frequently documented in the literature. An example is Dechow et al.'s (2003) study of whether the kink in earnings distribution can be explained by managing discretionary accruals upwards to avoid reporting losses.

Hypothesis 1c (H_{1c}) takes into account the differences between IPO firms and non-IPO firms. Different incentives and different accounting discretion of IPO and non-IPO firms at the time of cross-listing may influence their aggressiveness towards earnings management. Hence, H_{1c} is stated in null form that IPO firms and non-IPO firms engage in the same level of earnings management in the period immediately before the cross-listing events. I test this hypothesis by running the following cross-sectional model for the subsample of cross-listing years:[90]

$$EM_i = \gamma_0 + \gamma_1 IPO_i + \sum_{k=2}^{n} \gamma_k Controls_k + \varepsilon_i \tag{4.7}$$

where IPO_i is an indicator variable that equals to 1 for firms that raise new equity capital at cross-listing and 0 otherwise, and all other variables are as defined in Equation 4.6.

γ_1, the coefficient of the dummy variable IPO_i, is a differential intercept coefficient that shows the difference in earnings management between firms that raise new equity capital at cross-listing and firms that only cross-list home-country public shares. The test of the null and alternative hypotheses for H_{1c} can be expressed as:

H^0_{1c}: $\gamma_1 = 0$, H^1_{1c}: $\gamma_1 \neq 0$

[90] The cross-listing year refers to year 0. This subsample is obtained by choosing observations whose *CLY* dummy equals to 1.

4.5.2 Hypothesis 2: Cross-listing and Improvements in Earnings Quality

Hypothesis 2 addresses the bonding hypothesis by examining whether cross-listing firms have better earnings quality than their home-country firms that are not cross-listed. Consistent with Lang et al. (2003a), this research employs a matching procedure to construct the sample of non-cross-listing firms. A firm is qualified for matching if it is in the same home country, year, and industry group based on the two-digit SIC code, but is not cross-listed in the U.S. or the U.K. Then, for every firm-year observation in the cross-listing sample, I find a matched firm that has the closest value of *GROWTH*.

Hypothesis 2a (H_{2a}) states that firms that cross-list their stocks in the U.S. produce higher quality earnings through less aggressive earnings management than the home-country firms that are not cross-listed. To test this hypothesis, I run the following cross-sectional regression (Equation 4.8) for the U.S. cross-listing sample along with the matched control sample of non-cross-listing firms:

$$EM_{i,t} = \theta_0 + \theta_1 XLIST_{i,t} + \sum_{k=2}^{n} \theta_k Controls_k + \varepsilon_{i,t} \quad (4.8)$$

where the dependent variable $EM_{i,t}$ represents the measures of accruals-based earnings management of firm *i* in year *t* specified in Section 4.3 as well as the measure of target beating[91], $XLIST_{i,t}$ is an indicator variable that equals to 1 for a cross-listing firm and 0 otherwise, $Controls_k$ are the control variables specified in Section 4.4 that may affect the level of earnings management at the firm level, and $\varepsilon_{i,t}$ is the error term.[92]

θ_1, the coefficient of the dummy variable $XLIST_{i,t}$, is a differential intercept coefficient that shows the difference in earnings management between firms that cross-list their stocks in the U.S. and home-country firms that are not cross-listed. If H_{2a} is supported, θ_1 is expected to be negative and significantly different from zero. The null and alternative hypotheses can be written as:

H^0_{2a}: $\theta_1 = 0$, H^1_{2a}: $\theta_1 < 0$

Hypothesis 2b (H_{2b}) states that the difference in earnings quality between firms cross-listed in the U.S. and the home-country firms not cross-listed in the U.S. is greater in the post-SOX period than in the pre-SOX period. The potential SOX impact is addressed by adding SOX as a dummy variable to the regression as shown below:

[91] As discussed in Section 4.3.4, the measure of target beating in this thesis is small loss avoidance (*SLA*).

[92] Time-series properties of earnings (earnings persistence, predictability, and smoothness) are not investigated here for two reasons. First, these earnings quality measures require at least 7 years of time-series data for each firm. It creates difficulties in the matching procedure because firms that qualify for matching may not satisfy the data requirements. Second, many of the time-series properties of earnings have been addressed extensively by Lang et al. (2003a).

$$EM_{i,t} = \mu_0 + \mu_1 XLIST_{i,t} + \mu_2 SOX_{i,t} + \mu_3 XLIST_{i,t} \times SOX_{i,t}$$

$$+ \sum_{k=4}^{n} \mu_k Controls_k + \varepsilon_{i,t} \quad (4.9)$$

where $SOX_{i,t}$ is an indicator variable that equals to 1 if the year of observation is after 2002, and 0 otherwise, $XLIST_{i,t} \times SOX_{i,t}$ is an interactive term representing the product of the $XLIST_{i,t}$ dummy variable and $SOX_{i,t}$ dummy variable, and all other variables are as defined in Equation 4.8.[93]

μ_1, the coefficient of the dummy variable $XLIST_{i,t}$, is a differential intercept coefficient that shows the difference in earnings management between firms that cross-list their stocks in the U.S. and home-country firms that are not cross-listed after controlling for the impact of SOX and other firm-level characteristics. μ_2, the coefficient of the dummy variable $SOX_{i,t}$, is a differential intercept coefficient that shows the difference in earnings management between firms in the pre-SOX periods and firms in the post-SOX periods. μ_3, the interaction between $XLIST_{i,t}$ and $SOX_{i,t}$, captures the difference between firms cross-listed in the U.S. after SOX and all other firms.[94] It gives indication of the incremental impact of SOX on the difference in

[93] This variable definition aims to divide the sample into the pre- and post-SOX period. A limitation of this dichotomous variable is that it ignores the complexity in the enactment of SOX. Some of the most challenging sections of SOX (e.g. Section 404 of SOX) were implemented after 2002.

[94] The statistical interpretation of an interaction between two dummy variables is slightly different from the statistical interpretation of an interaction between a dummy variable and a continuous variable. The interaction between *XLIST* and *SOX* creates four possible combinations: (1) firms cross-listed in the post-SOX period, (2) firms cross-listed in the pre-SOX period, (3) firms not cross-listed in the post-SOX period, and (4) firms not cross-listed in the pre-SOX period. Combination (1) has an

earnings quality between cross-listing firms and non-cross-listing firms. If H_{2b} is supported, μ_3 is expected to be negative and significantly different from zero. The null and alternative hypotheses can be written as:

H^0_{2b}: $\mu_3 = 0$, H^1_{2b}: $\mu_3 < 0$

Hypothesis 2c (H_{2c}) states that firms that cross-list their stocks in the U.K. have better earnings quality than their home-country counterparts that are not cross-listed. This hypothesis is similar to H_{2a} in comparing the earnings quality of cross-listing firms and non-cross-listing firms. Therefore, I run the regression as specified in Equation 4.8 using the U.K. sample instead of the U.S. sample. If H_{2c} is supported, θ_1 is expected to be negative and significantly different from zero. The null and alternative hypotheses can be written as:

H^0_{2c}: $\theta_1 = 0$, H^1_{2c}: $\theta_1 < 0$

Hypothesis 2d (H_{2d}) states that the difference in earnings quality between the cross-listing firms and their home-country counterparts is greater when the firms are cross-listed in the U.S. than when the firms are cross-listed in the U.K. This hypothesis is tested by comparing θ_1 obtained from Equation 4.8 based on the U.S. cross-listing sample (i.e. $\theta_{1,US}$) and θ_1 obtained from Equation 4.8 based on the U.K.

interaction value of 1. All other combinations have an interaction value of 0, making them the baseline (or reference) category.

cross-listing sample (i.e. $\theta_{1,UK}$). If H_{2d} is supported, an independent sample t-test is expected to provide evidence that rejects the null hypothesis and accepts the alternative hypothesis as shown below:

H^0_{2d}: $\theta_{1,US} - \theta_{1,UK} = 0$, $\quad$ H^1_{2d}: $\theta_{1,US} - \theta_{1,UK} < 0$

4.5.3 Hypothesis 3: Earnings Management of Firms Cross-listed on the U.S. and the U.K. Market

Hypothesis 3 (H_3) states that earnings quality is higher for firms cross-listed on the U.S. markets than firms that cross-listed on the U.K. markets. However, the analysis is subject to selection bias because cross-listing firms self-select to cross-list on either the U.S. markets or the U.K. markets non-randomly. Firms' choices to cross-list on a specific market are observed *ex post* and it is challenging for empirical research to identify factors that have influenced managers' cross-listing decisions. In the presence of selection bias, the data upon which the ordinary least squares regression is based can be seriously distorted, resulting in coefficient bias in the estimation.

Intuitively, matching as a statistical technique can be used to address the selection bias as it does for the second hypothesis in Section 4.5.2. However, it is not considered for testing Hypothesis 3 for two reasons. First, matching a U.S. firm with a U.K. firm based on firm characteristics requires a clear understanding of the observable differences (e.g. firm size, growth, and performance) that indeed contribute to the selection bias. Results of the previous studies are mixed, especially because regulatory movements in the past few decades may have changed the relative benefits and costs of the cross-listing destinations. Second, the matching procedure becomes unmanageable when the number of such observables to match is large while the sample size of cross-listing firms is limited. In the study conducted by Piotroski and Srinivasan (2008), for example, more than 20 firm-level and country-level variables are used in examining foreign listing behaviour onto the U.S. and the U.K. markets.

As documented by Tucker (2010), the existing literature favours two econometric remedies to control for selection bias – the propensity score matching and the Heckman (1979) procedure. Propensity score matching is considered appropriate when the researcher can identify factors that only explain the self-selection of firms. In comparison, the Heckman (1979) procedure is more suitable if factors that explain the self-selection of firms may also be correlated to the treatment outcome (Lennox, Francis, and Wang 2012).[95] For H_3, country-level

[95] For Hypothesis 3, the treatment outcome is the evidence of earnings management.

differences play a major role in explaining firms' choices between the U.S. and the U.K. markets, while the same country-level differences may result in systematic differences in earnings management as documented by Leuz et al. (2003).[96] Therefore, the Heckman (1979) procedure is chosen for the purpose of testing H_3.

In particular, the Heckman (1979) procedure is originally proposed by Heckman (1976). A simple estimator called the inverse Mills' ratio is constructed that permits the regression models to yield estimates close to the maximum likelihood estimates. In the first stage, a regression for observing a positive outcome of the dependent variable is modelled with a probit model which generates the inverse Mills' ratio.[97] In the second stage, the self-selection bias is corrected by incorporating the inverse Mills' ratio as an explanatory variable into the ordinary least squares estimation.

For H_3, the Heckman (1979) procedure is applied using the treatment effect model.[98] In the first stage, I estimate a choice model to explain firms' overall decisions to cross-list onto the U.S. or the U.K. markets. The literature to date suggests that cross-listing choices are closely linked to various country-of-origin effects and firms' growth opportunities (e.g. Piotroski and Srinivasan 2008; Doidge,

[96] Piotroski and Srinivasan (2008) provide a comprehensive examination of the country-level factors affecting the cross-listing choices.

[97] Heckman (1979) notes that a logit should not be used in the first stage as the probit model could ensure that the error term follows a standard normal distribution.

[98] Lennox et al. (2012) provide a discussion of two different applications of the Heckman (1979) procedure – the treatment effect model and the sample selection model.

Karolyi, Lins, Miller, and Stulz 2009b). In this research, I model a firm's cross-listing choice between the U.S. and the U.K. markets as a function of the firm's growth opportunities and home-country effects including economic proximity, geographic proximity, status of economic development, and differences in local GAAP. Specifically, I estimate the following model:

$$US\_UK_{i,t} = \pi_0 + \pi_1 GROWTH\_OPPR_{i,t} + \pi_2 ECO\_PROX_{i,t} + \pi_3 GEO\_PROX_{i,t} + \pi_4 ECO\_DEV_{i,t} + \pi_5 DIFF\_GAAP_{i,t} + u_{i,t} \quad (4.10)$$

where the dependent variable, $US\_UK_{i,t}$, is an indicator variable that equals to 1 if firm i in year t is cross-listed on the U.K. markets and 0 if firm i in year t is cross-listed on the U.S markets, $u_{i,t}$ is the error term, and the explanatory variables are discussed separately below.

In order to capture the firm-specific incentives in the choice of cross-listing destinations, I include the variable $GROWTH\_OPPR_{i,t}$ to proxy for firm-level growth opportunities. Growth opportunity is an important factor in firms' cross-listing decision because firms with growth opportunities are likely to seek external financing to fund such opportunities. Following Doidge et al. (2009b), I define $GROWTH\_OPPR_{i,t}$ as firm *i*'s two-year geometric average of annual inflation-adjusted growth in sales (*ADJ_GROWTH*).[99] This can be expressed as:

$$GROWTH\_OPPR_{i,t} = \sqrt{(1 + ADJ\_GROWTH_{i,t-1})(1 + ADJ\_GROWTH_{i,t})} - 1.$$

Foreign firms are more likely to raise capital in the U.S. if the need for external financing is high. However, high-growth firms tend to be small in size that may not qualify them for a U.S. listing. Therefore, I make no directional prediction about the coefficient, π_1.

Consistent with Sarkissian and Schill (2004), I consider cross-listing firms' economic proximity ($ECO\_PROX_{i,t}$) to the U.S. markets. Kang and Stulz (1997) find that foreign investors tend to hold disproportionately more shares of firms that produce tradable output because they are more familiar with consuming these products. As a result, firms are more likely to consider cross-listing in countries with which they trade heavily. Following Sarkissian and Schill (2004), I define economic proximity as the percentage of firm *i*'s home country exports going to the U.S. in year t, which can be expressed as $ECO\_PROX_{i,t} = Exports_{US,t}/Exports_{Total,t}$. A firm's likelihood to choose the U.S. as the cross-listing destination increases as its economic proximity to the U.S. increases. Therefore, I expect its coefficient π_2 to be negative.

In a similar vein, geographic proximity ($GEO\_PROX_{i,t}$) may influence

[99] The compound annual growth rate is used to address the statistical issue of negative sales growth rates, which make it impossible to calculate geometric means.

cross-listing firms' choice of foreign markets. Grinblatt and Keloharju (2001) find a positive association between geographic proximity and investor holdings of foreign firms. Sarkissian and Schill (2004) argue that this U.S. investor holdings bias has profound influences on cross-listing firms' market preferences. Following Sarkissian and Schill (2004), I define geographic proximity as the Great Circle Distance from the cross-listing firm's capital city of the home country to the capital city of the U.S. (i.e. Washington, D.C.).[100] As the distance increases, firms are less likely to choose the U.S. markets as the cross-listing destination. Therefore, the coefficient of $GEO\_PROX_{i,t}$, π_3, is expected to be positive.

Economic development in the home country ($ECO\_DEV_{i,t}$) reflects the conjecture that foreign firms with different home country institutions are likely to be attracted by different financial markets. Doidge et al. (2009b) report that firms from countries with lower economic development have a stronger tendency to cross-list. Consistent with Doidge et al. (2009b), economic development is measured by the log of GNP per capita. Piotroski and Srinivasan (2008) provide evidence that firms from emerging markets are more likely to prefer a U.K. listing. Therefore, the coefficient of $ECO\_DEV_{i,t}$, π_4, is expected to be positive.

[100] In a related study, Piotroski and Srinivasan (2008) use a set of three indicator variables (Asia, South America, and the Caribbean) to capture cross-listing firms' geographic dispersion. They also find a significant cross-sectional variation in cross-listing firms' market preferences.

GAAP differences across countries ($DIFF\_GAAP_{i,t}$) are associated with the economic costs of cross-listing firms to comply with the disclosure requirements of the host-country markets. I measure GAAP differences using the "GAAP difference" score constructed by Bae, Tan, and Welker (2008) to capture differences in accounting standards across countries.[101] In terms of the impact of local GAAP differences on cross-listing market preferences, Seetharaman, Gul, and Lynn (2002) note that the efforts required for foreign firms to comply with the U.S. disclosure requirements are substantially different from those required to comply with the U.K. disclosure requirements.[102] Firms whose local GAAP differs significantly from the U.S. GAAP may be discouraged to cross-list on the U.S. markets. However, this preference may have altered as a result of the gradual adoption of IFRS worldwide, especially as the SEC has relaxed the reconciliation requirement for IFRS adopters. As a result, I make no directional prediction about the coefficient, π_5.

Conditional on this first stage analysis, I examine the impact of the cross-listing destinations on firms' earnings management behaviour in the second stage model. The inverse Mills' ratio obtained from Equation 4.10 is included as an additional explanatory variable in the ordinary least squares equation to control for the

[101] Bae et al. (2008) identify 21 key IAS items and obtain the GAAP differences score for each country by assessing whether local GAAP in a particular country conforms to the 21 IAS items.

[102] As noted before, the SEC imposed the reconciliation requirements on cross-listing firms.

correlation between the error terms $u_{i,t}$ in Equation 4.10 and $v_{i,t}$ in Equation 4.11 below:[103]

$$EM_{i,t} = \tau_0 + \tau_1 US\_UK_{i,t} + \tau_2 MILLS + \sum_{k=3}^{n} \tau_k Controls_k + v_{i,t} \qquad (4.11)$$

where the dependent variable $EM_{i,t}$ represents the measures of accruals-based earnings management, time-series properties of earnings, and the measure of target beating as specified in Section 4.3, $US\_UK_{i,t}$ is the indicator variable defined in Equation 4.10, $MILLS$ is the inverse Mills' ratio, $Controls_k$ are the control variables specified in Section 4.4, and $v_{i,t}$ is the error term.

τ_1, the coefficient of the dummy variable $US\_UK_{i,t}$, is a differential intercept coefficient that shows the difference in earnings quality between firms that cross-list on the U.S. markets and firms that cross-list on the U.K. markets. If H_3 is supported, τ_1 is expected to be positive and significantly different from zero for the accruals-based earnings management measures.[104] The null and alternative hypotheses can be written as:

H^0_3: $\tau_1 = 0$, H^1_3: $\tau_1 > 0$

[103] The correlation between the error terms is the source of the selection bias. Lennox et al. (2012, p. 591) provide a detailed explanation of how the inverse Mills' ratio is computed.

[104] Time-series properties of earnings are only used to supplement the primary tests based on the accruals models because they are based on a much smaller sample size as documented in the next chapter. The hypothesised direction of the τ_1 coefficient is also different, depending on the definition of the times-series properties of earnings.

4.5.4 Hypothesis 4: The Home-Country Impacts

As discussed in Section 3.5, Hypothesis 4 explores the impact of legal origin and enforcement issues in the home country on cross-listing firms. While a growing body of literature suggests that cross-country differences in legal origin and institutional matters help explain differences in financial development and investors' rights, many of the measures taken by researchers closely resemble La Porta et al.'s (1998) country classification. The relationship between earnings management and investor protection is examined in Leuz et al.'s (2003) cross-country study, which finds an inverse relationship between earnings management and investor protection. In the cross-listing context, the issues related to institutional environments are briefly addressed by Lang et al. (2006) where cross-listing firms are split into two subsamples on the basis of investor protection. They find a significant difference between the accounting quality of cross-listing firms and U.S. domestic firms for both subsamples.

Hypothesis 4a (H_{4a}) states that earnings quality is higher for cross-listing firms from home countries with stronger investor protection and legal enforcement than those with weaker investor protection and legal enforcement. To test H_{4a}, I run the following regression using the U.S. cross-listing sample and the U.K. cross-listing sample respectively:

$$EM_{i,t} = \varphi_0 + \varphi_1 CL_{i,t} + \varphi_2 INSTITUTIONS_i + \varphi_3 CL_{i,t} \times INSTITUTIONS_i + \sum_{k=4}^{n} \varphi_k Controls_k + \varepsilon_{i,t} \quad (4.12)$$

where the dependent variable $EM_{i,t}$ represents the measures of accruals-based earnings management, time-series properties of earnings, and the measure of target beating as specified in Section 4.3, $CL_{i,t}$ is an indicator variable that equals to 1 if firm *i* in year *t* is cross-listed and 0 otherwise, $INSTITUTIONS_i$ represents the institutional factors that characterise firm *i*'s home country, $CL_{i,t} \times INSTITUTIONS_i$ is an interactive term representing the product of the $CL_{i,t}$ dummy variable and $INSTITUTIONS_i$, $Controls_k$ are the control variables specified in Section 4.4, and $\varepsilon_{i,t}$ is the error term.[105] I check the robustness of the institutional proxies by adding the institutional variables one by one to Equation 4.12 to avoid multicollinearity issues.

φ_2, the coefficient of *INSTITUTIONS*, reveals the association between home country institutional environments and earnings quality. Depending on the measure of institutional factors used as the dependent variable, the φ_2 coefficient may be positively or negatively related to earnings quality. Examples are legal enforcement and ownership concentration. The former is expected to have a negative coefficient

[105] As will be seen in Chapter 6, institutions are measured in five dimensions: (1) legal origin, (2) legal tradition, (3) outside investor rights, (4) legal enforcement, and (5) ownership concentration. These five measures of institutional factors are based on La Porta et al. (1998), and country coverage of the sample is subject to data availability.

(strong enforcement reduces earnings management attempts) whereas the latter is expected to have a positive coefficient (high ownership concentration is associated with more earnings management attempts). In Equation 4.12, *INSTITUTIONS* is used as a general term that refers to “strong” home-country institutions, regardless of the signs and values that individual institutional indicators may take. Thus, if H_{4a} is supported, φ_2 is expected to be negative and significantly different from zero, indicating an inverse relationship between the two. The null and alternative hypotheses can be written as:

H^0_{4a}: $\varphi_2 = 0$, H^1_{4a}: $\varphi_2 < 0$

Hypothesis 4b (H_{4b}) states that the improvement in earnings quality is greater for cross-listing firms from home countries with weaker investor protection and legal enforcement. Firms’ improvements in earnings quality should be reflected in the decrease of accruals-based earnings management in the post-listing period (i.e. *CL* = 1). If the greatest improvement in earnings quality comes from firms with weak investor protection, the joint impact of cross-listing (*CL*) and institutional factors (*INSTITUTIONS*) on earnings quality should be negative. In other words, the φ_3 coefficient in Equation 4.12 is expected to be negative because the decision to cross-list reduces the difference in earnings quality between firms domiciled in countries with strong institutions and firms domiciled in countries with weak institutions. The null and alternative hypotheses can be written as:

H^0_{4b}: $\varphi_3 = 0$, H^1_{4b}: $\varphi_3 < 0$

4.6 Summary

The empirical research design, variable construction, and regression models used to test the hypotheses are discussed in this chapter. Previous studies on cross-listing firms' earnings management behaviours use three different benchmarks for comparison: (1) a matched sample of non-cross-listing firms in their home country, (2) U.S. firms listed on the U.S. markets, and (3) a cross-listing firm as its own control. This thesis extends the cross-listing literature by investigating the impact of different cross-listing destinations on earnings management. The earnings management metrics included in this research are models of accruals, time-series properties of earnings, and target beating. Following prior empirical research, I control for innate factors known to affect the level of earnings management.

Hypothesis 1 is tested by using the cross-listing firm as its own control. The "before-after" research design is intended to assess the impact of the cross-listing event on firms' engagement in earnings management. The paired difference between firms in the cross-listing years and firms in the non-cross-listing years gives an indication about firms' upward earnings management in the year of cross-listing.

Hypothesis 2 is tested by employing the matching procedure developed by Lang et al. (2003a) to construct a control sample consisting of non-cross-listing firms in the home countries. A dummy variable is constructed to distinguish between cross-listing firms and the non-cross-listing control sample. The impact of SOX is examined through the interaction between the SOX dummy variable and the cross-listing dummy variable.

In order to test Hypothesis 3, the Heckman (1979) procedure is used to control for selection bias. The treatment effect model based on this procedure consists of two stages. Stage One is a probit choice model to explain firms' decisions to cross-list onto the U.S. or the U.K. markets. Stage Two is the ordinary least squares equation to test the impact of the cross-listing destinations on firms' earnings quality. Selection bias is controlled by including the inverse Mills' ratio obtained from the first-stage regression as an explanatory variable in the second stage.

Hypothesis 4 uses institutional variables developed by La Porta et al. (1998) to test earnings quality of firms from different home countries. A feature of the research design involved in testing Hypothesis 4b is the interaction between the status of cross-listing and institutions to capture the relative improvements in earnings quality of firms with strong investor protection and firms with weak investor protection.

The next chapter presents sample construction and data sources used for the empirical tests, including key data issues that arise from the sample collection procedures. Selected descriptive statistics are also provided.

CHAPTER 5

DATA

5.1 Introduction

This chapter discusses the data that are used for the empirical tests as described in Chapter 4. Section 5.2 describes the sample selection procedures, which include data sources and the sample construction process. Section 5.3 reports the distribution of the U.S. and the U.K. cross-listing samples by geography, industry, and time. Key data issues arising from the research design, data sources, and sample selection procedures are discussed in Section 5.4. The chapter concludes in Section 5.5.

5.2 Sample Selection

5.2.1 Data Sources

To test the hypotheses, data of firms cross-listed on the U.S. markets and data of firms cross-listed on the U.K. markets are required. I obtain the data of cross-listing firms from several sources. The primary data source is Compustat via Wharton Research Data Services (WRDS). It provides accounting data necessary for computing the earnings management metrics and firm-level control variables. Firms cross-listed on the U.S. markets and firms cross-listed on the U.K. markets are obtained from the Compustat North America database and the Compustat Global database respectively. The Compustat Global database is also used as the basis to construct the control sample of non-cross-listing firms for Hypothesis 2. The alternative data source is the Bank of New York (BNY) Mellon Depositary Receipts Directory as of 2011, which keeps a track of DR activities in major DR exchanges.[106] It complements the Compustat file by providing data on the effective dates of cross-listing events and whether capital was raised at the time of cross-listing.[107] For cross-checking purposes, additional sources are used to verify that firms selected on Compustat are indeed cross-listing firms in the U.S. or the U.K. These additional sources are the websites of the NYSE, NASDAQ, and LSE, which contain web pages of the cross-listing firms and their effective listing dates.

In addition to the accounting data of cross-listing firms, macroeconomic data in the home countries are required for the two-stage design employed to test Hypothesis 3. These data series are collected from the World Economic Outlook (WEO) database, which comprises macroeconomic data reported by the International Monetary Fund (IMF) in the World Economic Outlook report.[108]

[106] The BNY DR Directory can be accessed at http://www.adrbnymellon.com/dr_directory.jsp.

[107] To test Hypothesis 1, it is required to know the year of cross-listing ($CLY_{i,t}$) and whether firms raise new equity capital at cross-listing (IPO_i). These data are obtained by merging the BNY DR information into the Compustat data.

[108] The WEO database is used to gather data on inflation rate, total exports, percentage of exports going to the U.S. or the U.K., and GNP per capita. Data on the WEO database are available from 1980 to the present, which fully cover the sample period used in this thesis.

5.2.2 Sample Construction

A few of the cross-listing studies (e.g. Jayaraman, Shastri, and Tandon 1993) make a distinction between firms listed on a foreign stock exchange in addition to their local exchanges and firms listed on a foreign stock exchange without being listed on their local exchanges.[109] However, the mainstream literature treats both types of the aforementioned listings as cross-listings (e.g. Miller 1999; Lang et al. 2003a, Lang et al. 2006). For the purpose of this thesis, it is considered appropriate to include both direct international listings and dual international listings because both types of listings are exposed to the benefits and costs of listing on the U.S. or U.K. markets. Therefore, in Section 2.3 of Chapter 2, a cross-listing firm is defined as one that lists its equity shares on one or more foreign stock exchange, regardless of whether the firm has already listed on its local exchange market.

Following this definition, construction of the U.S. cross-listing sample starts from an initial screening of the Compustat North America database for all firms listed on the U.S. markets from 1989 to 2011. Cross-listing firms are identified by selecting firms whose ISO Country Code of Incorporation differs from "USA".[110] The construction of the initial U.K. cross-listing sample is slightly different. I start from an

[109] These studies restrict their cross-listing sample to stocks that are already listed and actively trading on a non-U.S. market.

[110] The incorporation code indicates the country in which a firm is incorporated.

initial screening of the Compustat Global Annual database for firms whose Stock Exchange Code is 194, as this retrieves all firms that trade on the London Stock Exchange. Firms cross-listed on the U.K. market are identified by selecting firms whose ISO Country Code of Incorporation differs from "GBR".[111]

As shown in Panel A of Table 5.1, the initial data screening of Compustat North America yields a total of 45,870 firm-year observations over the period 1989 through 2011. From this initial sample, I first eliminate 15,973 inactive firms, reducing the sample to 29,897 firm-year observations.[112] Even in recognition of the survivorship bias that may present, inactive firms are deleted for two important concerns. First, the reasons as to why these firms became inactive are mixed.[113] The sample would be biased, for example, toward reorganised firms if the majority of firms become inactive through acquisition and merger. Second, it is proven to be difficult to check whether the inactive firms were indeed cross-listing firms. The list of terminated DR programs as per the BNY DR Directory only covers the period from 2008 to the present, which makes it complicated to trace the effective listing date and capital raising activities of

[111] A large number of prior cross-listing studies use Datastream to compile the sample of cross-listing firms, where the steps to select cross-listing firms from the full sample of U.S./U.K. firms on Compustat cannot be found. The selection procedures described in this thesis are confirmed by WRDS Support and S&P Client Support. I thank Mireia Gine, WRDS Support, for the feedback on searching for cross-listing firms.

[112] Compustat classifies a firm year as "inactive" when the firm is not currently trading on the stock exchange. In my initial U.S. cross-listing sample, approximately one third of the observations are inactive.

[113] In the U.S., firms become inactive mainly through Chapter 11 bankruptcy, Chapter 7 liquidation, conversion to private firms, and other corporate actions such as corporate spin-offs (Alexeev and Kim 2012).

these firms.[114]

Of the 29,897 active firm-year observations in the U.S., 18,087 Canadian firms are excluded from the sample as Canadian firms and U.S. firms face similar reporting environments.[115] The Canadian data would contradict the premise of the hypotheses developed in Chapter 3 that cross-listing firms in the U.S. face the additional legal and regulatory oversight which in turn affects their earnings quality. Canadian firms are considered a special case also because their incentives to cross-list in the U.S. are conceivably different from those of other foreign firms. Following early studies that document significantly lower bid-ask spreads for Canadian firms cross-listed on the U.S. markets than for their domestic counterparts (e.g. Tinic and West 1974), Karolyi (2006) claims that the primary motivation for Canadian firms to cross-list on the U.S. markets is the increased liquidity. Eun and Sabherwal (2003) also provide evidence that the U.S. share of total trading volume is inversely related to the ratio of bid-ask spreads for a sample of Canadian firms listed on both the Toronto Stock Exchange and a U.S. market.

[114] For the period between 2008 and 2011, the number of terminated DR programs as shown on the BNY DR Directory is 330 (i.e. 67 firms in 2008, 106 firms in 2009, 77 firms in 2010, and 80 firms in 2011), which only accounts for a very small fraction of the inactive cross-listing firms in my sample.

[115] Canadian firms do not trade as ADRs. Instead, they are directly listed on the U.S. exchanges.

Table 5.1

Sample Selection Procedures

Criteria	Firm-year observations	
Panel A: The U.S. cross-listing sample		
Initial screening of Compustat North America for cross-listing firms in the U.S. markets from 1989 to 2011	45,870	
less: Inactive firm-year observations	(15,973)	
	29,897	
less: Canadian firm-year observations	(18,087)	
	11,810	
less: data from regulated industries (i.e. SIC4400-5000 and SIC6000-6500)	(2,711)	
	9,099	
less: firm-year observations for which data are unavailable	(5,454)	
Total	3,645 firm year observations	327 unique firms
Panel B: The U.K. cross-listing sample		
Initial screening of Compustat Global Annual for cross-listing firms in the U.K. markets from 1989 to 2011	2,424	
less: Inactive firm-year observations	(539)	
	1,885	
less: data from regulated industries (i.e. SIC4400-5000 and SIC6000-6500)	(241)	
	1,644	

Table 5.1 (*continued*)

Criteria	Firm-year observations	
less: firm years for which data are unavailable	(460)	
Total	1,184 firm-year observations	176 unique firms

2,711 firms in the financial industry (SIC6000-6500) and other highly regulated industries (SIC4400-5000) are also excluded from the U.S. cross-listing sample. Due to different accrual choices and valuation processes, it is problematic to compute discretionary accruals for firms in the financial industry (Becker, DeFond, Jiambalvo, and Subramanyam 1998). The heavily regulated utility industry is also a special case to rule out because the degree of regulation may influence firms' incentives to manage earnings (Warfield, Wild, and Wild 1995). This restricts the U.S. cross-listing sample to 9,099 firm years.

I eliminate an additional 5,454 firm-year observations that are either missing data necessary to calculate statistics or "suspicious" data that cannot be verified as cross-listing firms through alternative sources as stated in Section 5.2.1. The final U.S. cross-listing sample consists of 327 unique firms with 3,645 firm-year observations. Panel B of Table 5.1 presents the sample construction for firms cross-listed on the U.K. markets. I construct the U.K. cross-listing sample using procedures similar to those used to construct the U.S. cross-listing sample. The only distinction is that Canadian firms are not excluded from the U.K. cross-listing sample since Canada is considered a special case mainly when the U.S. is the host country market.[116] The initial U.K. cross-listing sample consists of 2,424 firm-year observations. I eliminate 539 inactive firm years, 241 data observations that belong to regulated industries and financial institutions, and 460 firm years for which data are unavailable. This procedure yields a final U.K. cross-listing sample of 176 unique firms with 1,184 firm-year observations.

5.3 Summary Statistics

Table 5.2 presents summary statistics for the U.S. (Panel A) and the U.K. (Panel B) cross-listing samples based on the cross-listing firms' home countries. In general, firms are spread across a wide range of geographic locations. The U.S and the U.K. markets appear to have attracted foreign firms domiciled in different geographic regions.

[116] In fact, the decision to include or exclude Canada from the U.K. cross-listing sample should not be a concern in this thesis. The London Stock Exchange provides a continuous update of all the firms listed on the exchange. As at 31 March 2012, 11 Canadian firms are listed on the Main Market. However, these firms cannot be found in the Compustat Global database, and the final U.K. cross-listing sample contains no Canadian firms.

Table 5.2

Geographic Distribution of Firms Cross-listed on the U.S. and the U.K. Markets

Country	Number of firm-year observations	% of sample	Number of unique cross-listed firms
Panel A: The U.S. cross-listing sample			
Argentina	63	1.73	4
Australia	135	3.7	11
Belgium	16	0.44	2
Bermuda	151	4.14	15
Brazil	107	2.94	12
Switzerland	178	4.88	12
Chile	55	1.51	3
China	119	3.26	11
Colombia	5	0.14	1
Cayman Islands	479	13.14	85
Germany	117	3.21	11
Denmark	21	0.58	1
Spain	23	0.63	1
Finland	55	1.51	4
France	186	5.1	13
United Kingdom	414	11.36	27
Greece	8	0.22	1
Hong Kong	23	0.63	2
India	60	1.65	7
Ireland	134	3.68	9
Israel	58	1.59	5
Italy	92	2.52	6
Jersey	13	0.36	1
Japan	248	6.8	15
South Korea	33	0.91	3
Luxembourg	37	1.02	4
Mexico	149	4.09	10
Marshall Islands	6	0.16	1

Table 5.2 (*continued*)

Country	Number of firm-year observations	% of sample	Number of unique cross-listed firms
Netherland	243	6.67	17
Norway	47	1.29	3
Peru	15	0.41	1
Philippine	11	0.3	1
Russia	15	0.41	2
Singapore	20	0.55	1
Sweden	67	1.84	5
Taiwan	69	1.89	6
British Virgin Islands	38	1.04	6
South Africa	135	3.7	8
Total	3,645	100	327
Panel B: The U.K. cross-listing sample			
Australia	94	7.94	14
Belgium	8	0.68	2
Bermuda	153	12.92	19
Switzerland	24	2.03	2
China	10	0.84	2
Cayman Islands	51	4.31	9
Cyprus	13	1.1	2
Germany	13	1.1	2
Denmark	4	0.34	1
Spain	20	1.69	1
Finland	13	1.1	2
Falkland Islands	11	0.93	2
Gibraltar	24	2.03	3
Greece	8	0.68	1
Hong Kong	35	2.96	4
Isle of Man	51	4.31	14
India	8	0.68	1
Ireland	189	15.96	28

Table 5.2 (*continued*)

Country	Number of firm-year observations	% of sample	Number of unique cross-listed firms
Israel	90	7.6	12
Italy	6	0.51	1
Jersey	136	11.49	12
Luxembourg	22	1.86	2
Monaco	9	0.76	1
Malaysia	6	0.51	1
Netherlands	19	1.6	5
New Zealand	7	0.59	1
Papua New Guinea	9	0.76	1
Singapore	32	2.7	6
Sweden	10	0.84	1
British Virgin Islands	104	8.78	21
South Africa	5	0.42	3
Total	1,184	100%	176

The U.S. sample contains observations from 38 different home countries where there is a clustering of observations in the Cayman Islands (13.14%) and the U.K. (11.36%)[117]. This is consistent with Lang et al. (2006) and Ndubizu (2007) that U.K. firms constitute the highest proportion of the U.S. cross-listing sample.[118] Three other developed countries (Japan, the Netherlands, and France) are also significantly represented, with more than 5% of firm-year observations in the U.S. cross-listing

[117] The strong presence of tax-haven countries (e.g. the Cayman Islands, Bermuda, Jersey, and the Netherlands Antilles) in the cross-listing sample may raise some concerns, as these countries have very limited “home-country” impacts. This data issue is discussed in more detail in Section 5.4.

[118] While these studies do not specify their approach to classify the offshore islands, it may be useful to point out that the Cayman Islands is a British Overseas Territory located in the western Caribbean Sea.

sample.

The U.S. cross-listing sample also contains observations from a broad range of emerging markets and developing countries. Of the 9 developing economies in the sample, Mexico is the most heavily represented developing country in the sample with approximately 4% firm-year observations.[119] Among the BRIC countries, China and Brazil have important presence with 119 (3.26%) and 107 (2.94%) observations respectively.[120]

Panel B of Table 5.2 presents the country distribution of firms cross-listed in the U.K. market. The U.K. sample contains observations from 31 different countries, with Ireland (15.96%), Bermuda (12.92%), and Jersey (11.49%) most heavily represented.[121] Piotroski and Srinivasan (2008) suggest that Ireland and many other EU countries have strong economic links with the U.K., which may create incentives for U.K. cross-listings. Consistent with this conjecture, the U.K. sample has a wider coverage of the EU member states (12 versus 10, respectively) but a smaller coverage of developing countries (5 versus 9, respectively) compared with the U.S. sample.

[119] The classification of developing economies is based on the 2012 World Economic Outlook Report published by the IMF. It should be noted that some developed countries and regions were considered developing countries before 1997, including Hong Kong, Israel, Singapore, South Korea, and Taiwan.

[120] The presence of Chinese cross-listing firms would have been stronger if the listing count takes into the fact that a large proportion of firms incorporated in the tax-haven islands are indeed from China.

[121] The U.K. cross-listing sample again raises the issue of tax-haven countries. This is discussed in more detail in Section 5.4.

Table 5.3

Industry Distribution of Firms Cross-listed on the U.S. and the U.K. Markets

SIC Code	Description	Number of firm-year observations	% of sample	Number of unique cross-listed firms
Panel A: The U.S. cross-listing sample				
01	Agricultural production-crops	27	0.74	3
10	Metal mining	197	5.40	14
12	Coal mining	15	0.41	1
13	Oil and gas extraction	189	5.19	14
15	General building contractors	5	0.14	1
16	Heavy construction, ex. building	20	0.55	1
20	Food and kindred products	208	5.71	16
21	Tobacco products	33	0.91	2
23	Apparel & other textile products	79	2.17	5
25	Furniture and fixtures	19	0.52	1
26	Paper and allied products	86	2.36	6
27	Printing and publishing	26	0.71	2
28	Chemicals and allied products	357	9.79	30
29	Petroleum and coal products	178	4.88	14
32	Stone, clay, and glass products	58	1.59	4
33	Primary metal industries	164	4.50	13
34	Fabricated metal products	20	0.55	1
35	Industrial machinery & equipment	176	4.83	13
36	Electronic & other electric equipment	440	12.07	45
37	Transportation equipment	146	4.01	10
38	Instruments & related products	128	3.51	12
39	Misc. manufacturing industries	12	0.33	1
40	Railroad transportation	16	0.44	1
41	Local & interurban passenger transit	12	0.33	1
42	Trucking and warehousing	14	0.38	1
50	Wholesale trade-durable goods	19	0.52	1
51	Wholesale trade-nondurable goods	62	1.70	5
53	General merchandise stores	12	0.33	1
54	Food stores	59	1.62	4
55	Automotive dealers & service stations	2	0.05	1

Table 5.3 (*continued*)

SIC Code	Description	Number of firm-year observations	% of sample	Number of unique cross-listed firms
57	Furniture and home furnishings	15	0.41	1
58	Eating and drinking places	21	0.58	1
59	Miscellaneous retail	41	1.12	5
65	Real estate	58	1.59	7
67	Holding & other investment offices	75	2.06	4
70	Hotels and other lodging places	40	1.10	4
73	Business services	398	10.92	57
78	Motion pictures	3	0.08	1
79	Amusement & recreation services	7	0.19	1
80	Health services	19	0.52	2
82	Educational services	41	1.12	9
87	Engineering & management services	57	1.56	5
99	Non-classifiable establishments	91	2.50	6
Total		3,645	100	327
Panel B: The U.K. cross-listing sample				
01	Agricultural production-crops	15	1.27	3
10	Metal mining	192	16.22	29
12	Coal mining	4	0.34	1
13	Oil and gas extraction	146	12.33	24
14	Non-metallic minerals, except fuels	36	3.04	7
15	General building contractors	9	0.76	1
20	Food and kindred products	48	4.05	6
24	Lumber and wood products	5	0.42	1
26	Paper and allied products	6	0.51	1
28	Chemicals and allied products	74	6.25	10
29	Petroleum and coal products	10	0.84	2
30	Rubber & misc. plastics products	6	0.51	1
31	Leather and leather products	4	0.34	1
32	Stone, clay, and glass products	6	0.51	1
33	Primary metal industries	9	0.76	1

Table 5.3 (*continued*)

SIC Code	Description	Number of firm-year observations	% of sample	Number of unique cross-listed firms
35	Industrial machinery & equipment	67	5.66	10
36	Electronic & other electric equipment	54	4.56	8
38	Instruments & related products	29	2.45	5
42	Trucking and warehousing	15	1.27	1
50	Wholesale trade-durable goods	163	13.77	22
58	Eating and drinking places	8	0.68	2
59	Miscellaneous retail	20	1.69	2
70	Hotels and other lodging places	13	1.10	1
73	Business services	144	12.16	20
78	Motion pictures	7	0.59	1
79	Amusement & recreation services	67	5.66	9
80	Health services	2	0.17	1
87	Engineering & management services	20	1.69	4
99	Non-classifiable establishments	5	0.42	1
Total		1,184	100	176

Table 5.3 provides a breakdown of the sample by industry. As the results in Panel A indicate, the U.S. cross-listing sample spans more than 40 different two-digit SIC codes. In general, the observations are fairly evenly distributed among different industries, as 37 out of 43 industries account for less than 5% of the sample. Industry clustering is not obvious in the sample. Only 2 of the industries, Electronics (SIC 36, n = 440, 12.07%) and Business Services (SIC 73, n = 398, 10.92%), represent more than 10% of the sample.

Some two-digit industries have very small numbers of observations (e.g. SIC 55 Automotive, SIC 78 Motion Pictures, and SIC 15 Building Contractors), which create problems in implementing the discretionary accruals model. As specified in Chapter 4, the modified Jones model is based on one-digit SIC code in cases of insufficient data.

Panel B of Table 5.3 presents the industry distribution of the U.K. cross-listing sample. The U.K. cross-listing sample contains 29 different two-digit SIC codes. Compared with the U.S. cross-listing sample, the U.K. sample shows more significant tendency towards industry concentration. In terms of firm-year observations, the top five industries are Metal Mining (SIC 10, n = 192, 16.22%), Wholesale Goods (SIC 50, n = 163, 13.77%), Oil and Gas Extraction (SIC 13, n = 146, 12.33%), Business Services (SIC 73, n = 144, 12.16%), and Chemical Products (SIC 28, n = 74, 6.25%). The top five industries together represent approximately 60% of the total sample.

The potential concerns raised by high industry concentration in the U.K. cross-listing sample are alleviated in two aspects. First, the modified Jones model is expected to control for industry-year variation.[122] Second, more than 85% of the industries in the U.K. sample overlap with the industries contained in the U.S. sample. In particular, 3 out of the top 5 industries in the U.K. sample overlap with the top 5

[122] The industry effects are also controlled for from some other aspects of the research design. For example, the matching procedure used in testing Hypothesis 2 entail an exact match of industry group based on the two-digit SIC code.

industries in the U.S. sample (i.e. SIC 73 Business Services, SIC 10 Metal Mining, and SIC 28 Chemical Products). This entails a natural control of the industry effects in the comparison between the U.S. and the U.K. cross-listing sample.

Table 5.4 presents the distribution of the firm-year observations over the sample period. For the U.S. cross-listing sample, there is a strong growing trend in the 1990s from 41 firms in 1990 to 165 firms in 1999, representing a fourfold increase in one decade. As discussed in Section 2.1.1 of Chapter 2, the 1990s was a critical decade for the growth of the U.S. cross-listing market as firms cross-listed during this period were from a wide variety of countries (Eun and Sabherwal 2003). And attracting non-U.S. listings has been a top priority of the U.S. stock exchanges during this period.

The increase in firms cross-listed in the U.K. is evident for the sample subperiod 2002 to 2006, which coincides with the implementation of SOX sections in the U.S. markets. Consistent with Piotroski and Srinivasan (2008) and Doidge et al. (2009a), the increasing trend of U.K. cross-listings may be attributed to the increasing popularity of the U.K. markets and the observed switch of cross-listing firms to the U.K. markets after SOX. The 2008 global economic crisis may also play a role in cross-listing activities as growth in the number of cross-listing firms has stagnated between 2008 and 2010.

Table 5.4

Time Distribution of Firms Cross-listed on the U.S. and the U.K. Markets

		The U.S. cross-listing sample		The U.K. cross-listing sample	
Year[a]	Total	Number of firms	% of sample	Number of firms	% of sample
1989	45	45	1.23	0	0.00
1990	41	41	1.12	0	0.00
1991	49	49	1.34	0	0.00
1992	71	68	1.87	3	0.25
1993	83	75	2.06	8	0.68
1994	92	83	2.28	9	0.76
1995	111	101	2.77	10	0.84
1996	127	113	3.10	14	1.18
1997	149	127	3.48	22	1.86
1998	171	142	3.90	29	2.45
1999	195	165	4.53	30	2.53
2000	209	178	4.88	31	2.62
2001	214	183	5.02	31	2.62
2002	220	187	5.13	33	2.79
2003	248	199	5.46	49	4.14
2004	274	210	5.76	64	5.41
2005	344	244	6.69	100	8.45
2006	385	257	7.05	128	10.81
2007	396	271	7.43	125	10.56
2008	424	298	8.18	126	10.64
2009	423	293	8.04	130	10.98
2010	428	296	8.12	132	11.15
2011	130	20	0.55	110	9.29
Total	4,829	3,645	100	1,184	100

[a] Firm-year data in the Compustat annual database for 2011 were retrieved on 16 May 2011. As a result, my sample does not provide a complete set of data for 2011, for some firms have fiscal year ends after May.

5.4 Key Data Issues

5.4.1 Data Availability

It is common in cross-listing studies to cross-check cross-listing firms obtained from databases against a complete list of cross-listing firms provided by the issuing banks or the stock exchanges. As mentioned in Section 5.2.1, the list of cross-listing firms provided by BNY DR Directory and the stock exchanges' websites are used to supplement the Compustat data. As of November 2011, the BNY DR Directory shows 286 ADR programs listed on the NYSE and 94 ADR programs listed on NASDAQ.[123] My U.S. cross-listing sample contains 182 ADR programs actively trading on the NYSE and 70 ADR programs actively trading on NASDAQ. It indicates that the Compustat database offers a good coverage of firms cross-listed the U.S.[124]

The cross-checking procedure is also performed for the U.K. sample. As at 31 March 2012, the complete company list provided by the London Stock Exchange shows 319 foreign firms listed on the Main Market for the period between 1 January 1989 and 31 December 2011.[125] My U.K. sample contains 176 unique firms over the

[123] The number of ADRs on the NYSE includes 4 firms listed on NYSE Amex.

[124] Compared with prior cross-listing studies, the coverage of cross-listing firms in my sample (64% of the NYSE and 74% of NASDAQ) is improved. For example, Ndubizu (2007) starts with an initial sample of 858 non-U.S. firms listed on the NYSE and NASDAQ, and ends with 550 firms in the final sample, representing a sample coverage of 64%.

[125] The list provided by the London Stock Exchange contains all companies on the exchange at the end of each month. Therefore, all companies on the list were actively trading at that point of time.

same period of time.[126] Although the coverage of firms cross-listed on the U.K. markets is slightly lower than that of firms cross-listed on the U.S. markets, it should not raise major concerns about sample representativeness.

5.4.2 Effective Listing Dates

Accurate identification of the cross-listing date has proven to be a difficult task. To verify the date of cross-listing, I match the effective listing date shown on the BNY DR Directory with the listing date shown on the stock exchanges' websites. During this process, I notice that the effective date of cross-listing for some firms differs from that provided on the stock exchanges' websites.

Berkman and Nguyen (2010) note that the inconsistency in the effective listing dates is due to the continuous updates of listing information by issuing banks. When a cross-listing firm changes its listing type, exchange market, or depositary bank, the effective cross-listing date is updated. To identify the original date of cross-listing, I cross-check the listing date using the DR Universe guide provided by J.P. Morgan and other publicly available internet sources such as Google Search and the websites of cross-listing firms[127].

[126] AIM firm data are not included in the sample because the AIM is a privately-regulated market with limited regulatory oversight.

[127] The DR Universe guide can be accessed at https://www.adr.com/DRSearch/CustomDRSearch

5.4.3 Tax-haven Countries

As discussed in Section 5.3.1, my cross-listing sample consists of a significant proportion of firms incorporated in offshore islands as a result of “round-tripping”. These small islands host offshore finance centres built upon their history as tax havens. Non-sovereign jurisdictions such as Bermuda, the Cayman Islands, the British Virgin Islands, Jersey, and Isle of Man are heavily represented in my sample. The presence of these “home countries” in my sample creates potential issues because a firm’s country of incorporation is likely to be unrelated to its country of operation. For this reason, some prior studies label firms incorporated in the offshore tax havens as “flag of convenience” and exclude them from the sample (e.g. Pulatkonak and Sofianos 1999; Eleswarapu and Venkataraman 2006).

Following Piotroski and Srinivasan (2008), I decide to retain these firms in my sample for hypotheses testing because they form a large portion of the sample. More importantly, most of these firms are indeed headquartered in foreign countries other than the U.S. or the U.K., which satisfy the definition of a cross-listing firm in my thesis. To further alleviate concerns about the country of origin, I use ISO Country Code of Headquarters instead of ISO Country Code of Incorporation to identify the primary country of operation.

5.4.4 Time-series Properties of Earnings

The models of accruals introduced in Section 4.3.1 of Chapter 4 require time-series data that are calculated over rolling seven-year windows.[128] However, due to limited sample availability of cross-listing firms, only 95 firms cross-listed in the U.S. (473 firm-year observations) and 38 firms cross-listed in the U.K. (202 firm-year observations) satisfy the data requirement. This implies that results based on these measures of earnings attributes should be considered secondary to results based on accruals models with a much larger sample size.

Another potential concern inherent in the time-series data is the possibility of correlated residuals. The time-series sample comprises, on average, 4.98 observations per firm for the U.S. cross-listings and 5.32 observations per firm for the U.K. listings. Residuals of observations from the same firm may be autocorrelated and thereby affect significant levels of the analyses. Consistent with Lang et al. (2006), I address this issue by re-estimating the time-series properties of earnings using only one observation per firm. Untabulated results show consistency with the main tests.

[128] The rolling seven-year window causes a further loss of six firm-year observations per firm for firms that satisfy the data requirements, as the estimation per time-series requires seven firm-year observations to start with.

5.5 Summary

In this chapter, I describe the data sources, sample construction process, and key data issues in the sample. The primary data source is Compustat, which provides accounting data necessary for computing the earnings management metrics and other control variables. Alternative sources such as the BNY DR Directory and stock exchanges' websites are also used for cross-checking.

For the U.S. cross-listing sample, the main reasons for losing observations include deletion of inactive firms, exclusion of Canadian firms, and absence of data in Compustat needed to construct variables. For the U.K. cross-listing sample, inactive firms and absence of data also cause a significant reduction in the sample size.

The summary statistics show that the sample has a wide coverage of firms from different home countries. Both developed countries and developing countries are well represented in the sample, but the U.K. cross-listing sample contains more EU member states. In terms of industry distribution, the U.S. sample is evenly spread across the two-digit SIC code, whereas the U.K. sample shows relatively high industry concentration. The time distribution shows that the number of cross-listing firms in the U.S. increases in the 1990s and slows down immediately after the enactment of SOX. In contrast, the number of cross-listing firms in the U.K. experiences an increase during the SOX introduction phase.

Based on the problems encountered in the data collection process and patterns identified in the preliminary analyses, four data issues are discussed. First, a comparison of the sample against the list of cross-listing firms from alternative sources reveals that some cross-listing firms are missing in my sample, but the coverage of cross-listing firms is improved compared with prior studies. Therefore there are no major concerns over sample representativeness. Second, the sample collection procedures may result in incorrect listing dates. This issue is addressed by further verification of the original cross-listing dates. Third, the sample consists of a significant number of firms incorporated in tax-haven countries. For these firms, I use their headquarters to identify the primary country of operation, which better resembles their country of origin. Fourth, time-series properties of earnings are based on a much smaller sample size, which may limit their statistical validity as proxies for earnings management. The potential issue of autocorrelation embedded in the time-series data is also addressed.

The next chapter presents and discusses the empirical results of statistical tests of the four hypotheses using the data samples described above.

CHAPTER 6

RESULTS

6.1 Introduction

In this chapter, I discuss the results of hypothesis tests using data as described in Chapter 5. Hypothesis 1 states that firms manage earnings upwards in the period surrounding cross-listing. I test this hypothesis using the "before-after" research design for the U.S. and the U.K. samples respectively. The difference between IPO and non-IPO firms is also investigated in terms of their levels of earnings management.

Hypothesis 2 states that cross-listing firms have better earnings quality than their home-country counterparts. I employ the matching procedure described in Section 4.5.2 of Chapter 4 to construct the home-country control sample and to make the comparison. For the U.S. sample, the potential effect of SOX on the earnings quality of cross-listing firms is investigated.

Hypothesis 3 states that firms cross-listed in the U.S. markets have better earnings quality than firms cross-listed in the U.K. markets due to differences in firm characteristics, accounting standards-setting procedures, and the legal and regulatory environments. To investigate this issue, I firstly use the Heckman (1979) procedure to simulate firms' cross-listing choices in order to control for selection bias. Then, I test the impact of the cross-listing destinations on firms' earnings quality.

Hypothesis 4 states that cross-listing firms domiciled in countries with stronger institutions have better earnings quality, while cross-listing firms domiciled in countries with weaker institutions experience greater improvements in earnings quality in period after cross-listing. Institutional variables used in the empirical tests are based on La Porta et al. (1998), and the interaction between the status of cross-listing and institutions is examined.

In Section 6.2 through Section 6.5 below, I present the results of testing the four hypotheses stated above, which include both univariate and multivariate data analyses. Section 6.6 provides robustness tests to address some of the issues arising from the empirical results and Section 6.7 summarises the findings.

6.2 Hypothesis 1

6.2.1 Univariate Analyses

Hypothesis 1 states that firms may manage earnings upward in the period surrounding cross-listing as they are motivated by the significant benefits of cross-listing on the U.S. and the U.K. markets. This hypothesis is addressed using the "before-after" research design where each cross-listing firm is used as its own control, and an event window spanning from year -2 to year 2 is selected.

As documented in Section 5.2.2 of Chapter 5, the initial U.S. cross-listing sample consists of 327 unique firms with 3,645 firm-year observations. I use this initial sample to construct variables required for testing Hypothesis 1. In this process, an additional 327 firm-year observations are lost in computing variables that require lagged data.[129] To be included in the final sample, data on a sample firm must be available for both the cross-listing year (year 0) and the non-cross-listing years (year -2, -1, 1, and/or 2).[130] This restriction eliminates 9 firms. The data are then trimmed to include only the event window spanning from year -2 to year 2. This leaves the U.S. cross-listing sample with 303 firms and 1,167 firm-year observations.

The initial U.K. cross-listing sample consists of 176 unique firms with 1,184 firm-year observations. In the process of constructing lagged variables, I lose one observation for each firm in the sample. An additional 8 firms are excluded from the sample as they only have data on the cross-listing year (year 0). The data are then trimmed to include only the event window spanning from year -2 to year 2, leaving the U.K. cross-listing sample with 148 firms and 495 firm-year observations.

[129] Lagged data are required for both the earnings management metrics and the control variables that I employ in the analysis. In particular, lagged assets and lagged revenue are used to calculate discretionary accruals (*DA*), and lagged revenue is used to calculate growth (*GROWTH*).

[130] Because the research design uses each firm as its own control, it is essential to have firm-year data on both the cross-listing year and the non-cross-listing years for the same firm.

Table 6.1

Descriptive Statistics of Key Variables around the Cross-listing Event[a]

Variables[b]	-2	-1	0	1	2
Panel A: The U.S. sample (mean, median, standard deviation in parentheses)					
TA	-0.037	-0.195	0.012	-0.039	-0.071
	-0.043	-0.043	-0.039	-0.046	-0.048
	(0.396)	(1.372)	(0.443)	(0.141)	(0.262)
DA	-0.035	0.017	-0.018	-0.037	-0.030
	-0.021	-0.016	-0.018	-0.033	-0.028
	(0.114)	(0.377)	(0.194)	(0.149)	(0.123)
ABSDA	0.073	0.151	0.113	0.111	0.088
	0.048	0.073	0.064	0.078	0.058
	(0.094)	(0.346)	(0.158)	(0.106)	(0.091)
PEROA	-0.955	-0.645	-0.470	-0.649	-0.898
	-0.519	-0.416	-0.383	-0.475	-0.600
	(1.477)	(1.902)	(1.975)	(2.051)	(1.878)
PERTA	0.234	0.310	0.852	0.764	0.407
	0.377	0.354	0.479	0.492	0.334
	(1.293)	(1.613)	(2.098)	(1.903)	(1.877)
SIZE	8.397	7.164	7.418	7.676	7.759
	8.957	7.189	7.198	7.643	7.653
	(2.200)	(2.552)	(2.215)	(2.187)	(2.115)
GROWTH	0.085	0.204	0.201	0.100	0.072
	0.096	0.190	0.201	0.124	0.088
	(0.245)	(0.329)	(0.302)	(0.312)	(0.354)
SSTK	35.261	44.283	137.034	68.877	55.857
	4.344	1.057	52.830	1.486	1.387
	(77.908)	(145.617)	(234.390)	(196.832)	(171.366)
LEV	0.526	0.501	0.432	0.453	0.461
	0.552	0.515	0.433	0.467	0.481
	(0.197)	(0.206)	(0.220)	(0.216)	(0.212)
ROA	0.068	0.094	0.094	0.027	0.057
	0.082	0.088	0.088	0.079	0.075
	(0.348)	(0.243)	(0.226)	(0.613)	(0.200)

Table 6.1 (*continued*)

Variables[b]	-2	-1	0	1	2
Panel B: The U.K. sample (mean, median, standard deviation in parentheses)					
TA	-0.100	-0.109	-0.034	-0.063	-0.073
	-0.072	-0.062	-0.013	-0.032	-0.050
	(0.141)	(0.185)	(0.141)	(0.157)	(0.143)
DA	-0.116	-0.159	0.065	-0.063	-0.063
	-0.068	-0.153	0.032	-0.051	-0.062
	(0.171)	(0.214)	(0.241)	(0.201)	(0.202)
ABSDA	0.161	0.247	0.197	0.172	0.165
	0.077	0.197	0.130	0.123	0.112
	(0.181)	(0.225)	(0.209)	(0.154)	(0.185)
PEROA	-1.605	-0.522	-0.193	-0.478	-0.585
	-0.762	-0.463	-0.161	-0.271	-0.461
	(2.021)	(1.358)	(1.812)	(1.994)	(1.861)
PERTA	0.895	0.641	1.382	1.372	1.101
	0.720	0.403	0.651	0.679	0.514
	(2.714)	(1.775)	(2.672)	(2.823)	(2.477)
SIZE	5.165	4.014	4.106	4.262	4.355
	5.903	3.804	3.947	4.164	4.323
	(2.527)	(2.319)	(2.080)	(2.018)	(2.050)
GROWTH	0.203	0.213	0.298	0.257	0.229
	0.020	0.064	0.125	0.068	0.011
	(0.596)	(0.609)	(0.643)	(0.581)	(0.625)
SSTK	22.190	16.601	22.207	17.810	23.949
	0.200	0.254	1.139	0.435	0.640
	(49.493)	(46.313)	(49.213)	(46.750)	(54.678)
LEV	0.529	0.496	0.365	0.396	0.410
	0.570	0.540	0.320	0.380	0.395
	(0.233)	(0.303)	(0.259)	(0.258)	(0.260)
ROA	0.045	-0.084	-0.075	-0.101	-0.102
	0.062	0.024	-0.010	-0.017	-0.001
	(0.136)	(0.312)	(0.280)	(0.291)	(0.301)

Table 6.1 (*continued*)

[a]This table reports descriptive statistics of key variables for testing Hypothesis 1 from year -2 to year +2 relative to the cross-listing event (year 0). Panel A presents the U.S. cross-listing sample that comprises 303 firms and 1,167 firm-year observations. Panel B presents the U.K. cross-listing sample that comprises 148 firms and 495 firm-year observations.

[b]Total accruals (*TA*) are defined as net income before extraordinary items (Compustat item 18) less cash flows from operations (Compustat item 308) scaled by total assets (Compustat item 6). Discretionary accruals (*DA*) are computed as the difference between total accruals and normal accruals, where normal accruals are estimated using the modified Jones model. The absolute value of discretionary accruals (*ABSDA*) is obtained by taking the absolute value of *DA*. Percent operating accruals (*PEROA*) are defined as net income (Compustat item 172) less cash from operations (Compustat item 308), divided by the absolute value of net income. Percent total accruals (*PERTA*) are defined as net income (Compustat item 172) less net cash flow to/from equityholders (purchase of common and preferred stock (Compustat item 115) + cash dividends (Compustat item 127) – sales of common and preferred stock (item 108)) less increase in cash balance (Compustat item 274), divided by the absolute value of net income. For the control variables, firm size (*SIZE*) is measured by the natural log of total assets, growth (*GROWTH*) is defined as percentage change in sales (Compustat item 12), equity issuance (*SSTK*) is the sales of common and preferred stock (Compustat item 108), financial leverage (*LEV*) is defined as total liabilities (Compustat item 181) divided by total assets, and return on assets (*ROA*) is defined as earnings before interest and taxes (Compustat item 178) divided by total assets. All variables are winsorised at the 5th and 95th percentiles.

Figure 6.1

Level of Accruals from Year -2 to Year +2 relative to the Cross-listing Event (the U.S. Cross-listing Sample)

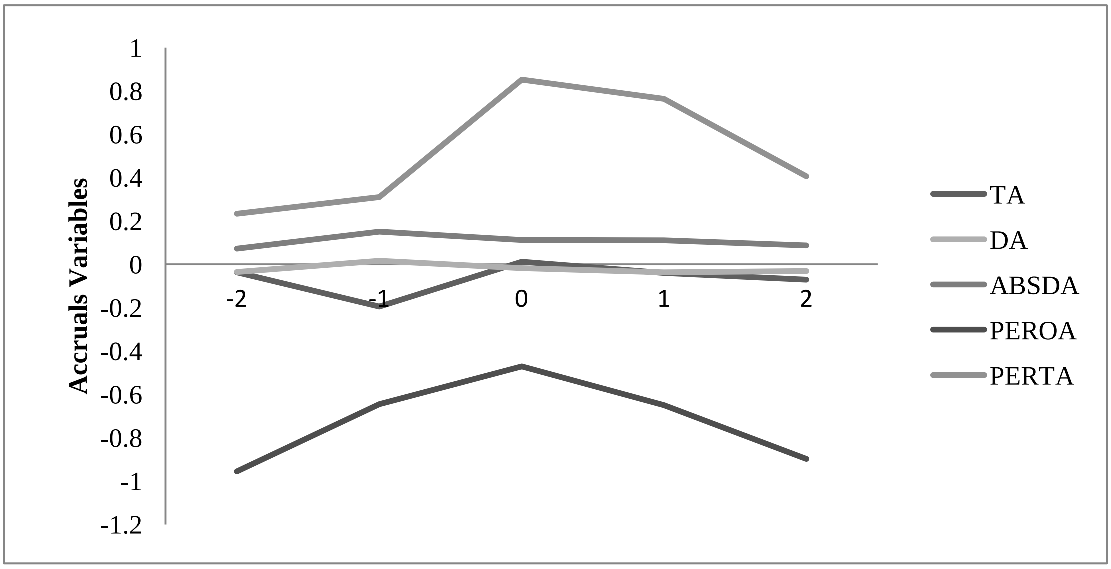


Table 6.1 summarises the descriptive statistics (mean, median, and standard deviation) of the dependent variables and control variables for testing Hypothesis 1 from year -2 to year +2 relative to the cross-listing event (year 0). Panel A shows the results from the U.S. cross-listing sample, while Panel B shows the results from the U.K. cross-listing sample.

As shown in Panel A of Table 6.1 and Figure 6.1, all the accrual variables peak in either the year of cross-listing (year 0) or the year preceding the cross-listing year (year -1). In particular, the mean total accruals (*TA*) is at its lowest level of -0.195 in year -1, and it increases to 0.012 in year 0. Similarly, percent operating accruals (*PEROA*) and percent total accruals (*PERTA*) increase from -0.645 and -0.310 in year -1 to -0.470 and 0.852 in year 0, respectively. The measures of discretionary accruals show a slightly different timing as discretionary accruals (*DA*) and the absolute value of discretionary accruals (*ABSDA*) peak in year -1. The results are similar when the median values of accruals are examined. Total accruals and percent operating accruals peak in year 0 while discretionary accruals peak in year -1.

The statistics for the control variables correspond mostly to the anticipated impacts of the cross-listing event. The mean and median firm sizes (*SIZE*), as measured by log of assets, increase from 7.164 and 7.189 in the year preceding the cross-listing year (year -1) to 7.676 and 7.643 in the year immediately after the cross-listing year (year 1), respectively. New equity issuance (*SSTK*) is the highest in year 0, which coincides with the cross-listing event. Financial leverage (*LEV*), as measured by total liabilities divided by total assets, is reduced after the cross-listing event. Growth (*GROWTH*), defined as percentage change in sales, more than doubled to 20.4 percent in year -1 from only 8.5 percent in year -2. This high growth rate is maintained in the year of cross-listing as indicated by the average growth rate of 20.1 percent in year 0. Then average growth slows down in year 1 to 10 percent and declines a further 2.8 percent to 7.2 percent in year 2. Return on assets (*ROA*), defined as earnings before interest and taxes divided by total assets, also peak in year -1 and year 0 with a value of 0.094 compared to 0.068 in year -2 and 0.027 in year 1.

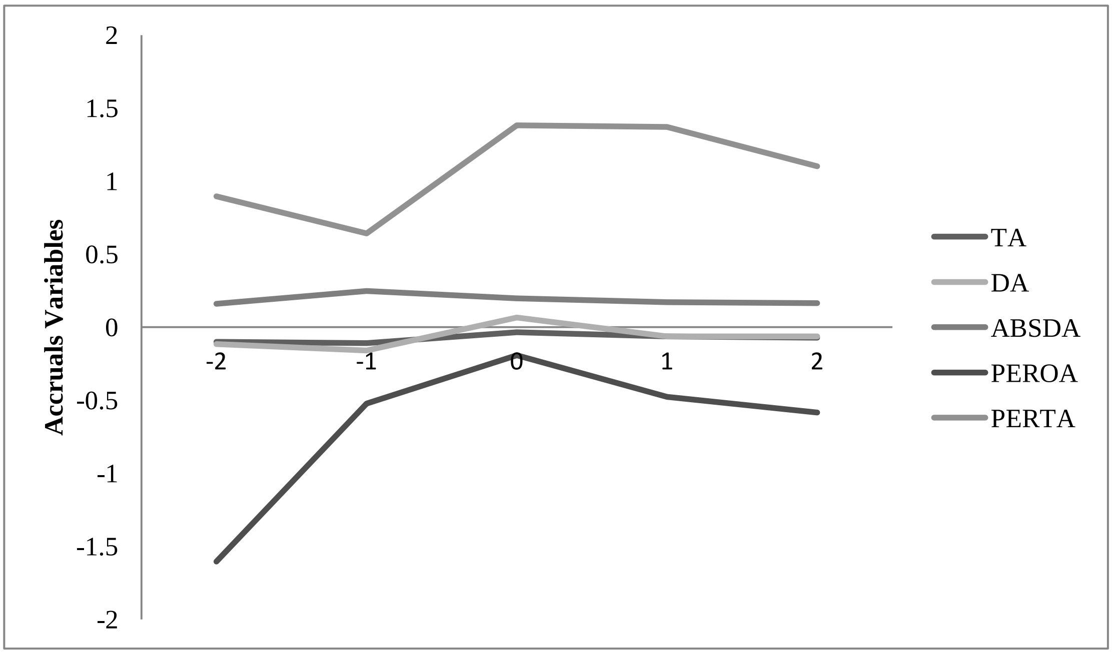
The patterns in growth and return on assets over the event window are worth noting because they indicate that firms may time cross-listings to exploit the potential information advantage or to take advantage of windows of opportunity (Bae, Jeong, Sun and Tang 2002; Ndubizu 2007). For example, growth peaks in year -1 and year 0 and this evidence suggests that managers might have timed cross-listings to a period of time when the firms are growing most rapidly. Similarly, return on assets peaks in year -1 and year 0, which means that firms tend to pursue cross-listing when returns are relatively high.

Panel B of Table 6.1 and Figure 6.2 present the descriptive statistics from the

U.K. cross-listing sample. Similar to the patterns revealed by the U.S. cross-listing sample, mean values peak at year 0 for all accrual variables except the absolute value of discretionary accruals. Median values of accruals follow a similar pattern, with the only exception being percent total accruals that fluctuate over the event window.

Figure 6.2

Level of Accruals from Year -2 to Year +2 relative to the Cross-listing Event (the U.K. Cross-listing Sample)



For the control variables, statistics for growth, equity issuance, and leverage are generally in accord with those of the U.S. cross-listing sample. The mean and median values of growth peak in year 0 at 29.8 percent and 12.5 percent, respectively. New equity issuance is the highest in the year of cross-listing (mean = 22.207). Cross-listing firms are also tilted towards equity financing as indicated by the decrease in leverage from 0.529 in year -2 to 0.365 in year 0.

Different from the U.S. cross-listing sample, firm size does not increase markedly in the year of cross-listing in particular. Instead, both mean and median firm size increase over time from year -1 to year 2. The mean return on assets is negative for year -1 through year 2, although it is least negative in year 0 (-0.075). This phenomenon of rapid sales growth combined with relatively poor performance surrounding stock offerings is documented in previous studies (e.g. Loughran and Ritter 1997; Rangan 1998). A likely economic explanation is that firms experiencing rapid sales growth attract new entrants into their industries and consequently drive down profits (Rangan 1998).

Table 6.2 reports the test statistics for the paired differences between the year of cross-listing (year 0) and other firm-years (year -2, -1, 1, or 2) in the event window. Four periods of intervals are formed: -2 to -1, -1 to 0, 0 to 1, and 1 to 2, representing the paired difference between the two years (e.g. -2 to -1 means subtracting the value in year -2 from the value in year -1). “0 – others” refers to the difference between the cross-listing year and the mean value of non-cross-listing years. The paired samples t-tests and the Wilcoxon matched-pairs signed-ranks tests are used to test whether the mean or median difference for each variable measuring performance or earnings quality is different from zero.

Panel A of Table 6.2 presents the results for the U.S. cross-listing sample. Paired t-tests and Wilcoxon tests on the paired data of return on assets and cash flows from operations (*CFO*) generally support the observation that performance peaks in either year -1 or year 0. In particular, firms in year 0 have significantly higher mean return on assets (p-value = 0.058) and operating cash flows (p-value = 0.046) than those in year 1.

Firms in the cross-listing period also have significantly higher total accruals (p-value = 0.076) and percent total accruals (p-value = 0.002) than those in the period before and after cross-listing. This is consistent with Ndubizu's (2007) observation that accrual variables peak in the cross-listing year and fall subsequently in the following year. However, the cross-listing event does not appear to have profound impacts on signed discretionary accruals. The absolute value of discretionary accruals decreases from year -1 to year 0, indicating a reduction in the combined effect of income-increasing and income-decreasing earnings management decisions.

Table 6.2

Univariate Tests of Variables Measuring Performance and Earnings Quality[a]

Event	*ROA*		*CFO*		*TA*		*DA*		*ABSDA*		*PEROA*		*PERTA*	
window[b]	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Panel A: The U.S. cross-listing sample (p-value in parentheses[c])														
-2 to -1	0.000	0.004	0.004	-0.002	0.001	0.006	0.015	0.006	0.007	0.002	0.152	0.060	0.134	-0.043
	(0.983)	(0.948)	(0.612)	(0.740)	(0.965)	(0.349)	(0.164)	(0.369)	(0.422)	(0.465)	(0.392)	(0.230)	(0.420)	(0.961)
-1 to 0	0.000	-0.002**	-0.020*	0.003	0.155*	-0.002	-0.017	-0.003	-0.047**	-0.011	-0.004	-0.028	0.465***	0.074**
	(0.500)	(0.045)	(0.060)	(0.223)	(0.076)	(0.761)	(0.117)	(0.539)	(0.029)	(0.128)	(0.488)	(0.733)	(0.002)	(0.032)
0 to 1	-0.071*	-0.012***	-0.021**	-0.002	-0.059**	-0.006	-0.021	-0.016	-0.002	0.014	-0.152	-0.908	-0.117	-0.060
	(0.058)	(0.000)	(0.046)	(0.184)	(0.040)	(0.967)	(0.161)	(0.170)	(0.859)	(0.597)	(0.256)	(0.594)	(0.519)	(0.997)
1 to 2	0.032	-0.008	0.003	0.000	-0.039**	-0.003	0.001	0.005	-0.024	-0.026***	-0.273*	-0.114	-0.389**	-0.166**
	(0.315)	(0.838)	(0.760)	(0.171)	(0.028)	(0.135)	(0.457)	(0.792)	(0.003)	(0.002)	(0.102)	(0.259)	(0.041)	(0.029)
0 - others	0.029*	0.006*	0.003	0.002	0.112***	0.007	-0.007	0.010	-0.014	-0.016	0.259***	0.184	0.409***	0.011*
	(0.066)	(0.074)	(0.3586)	(0.249)	(0.000)	(0.136)	(0.670)	(0.448)	(0.314)	(0.257)	(0.010)	(0.007)	(0.002)	(0.057)

Table 6.2 (*continued*)

Event window[b]	*ROA*		*CFO*		*TA*		*DA*		*ABSDA*		*PEROA*		*PERTA*	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Panel B: The U.K. cross-listing sample (p-value in parentheses[c])														
-2 to -1	-0.033	-0.025*	-0.078***	-0.027***	0.022	0.045	-0.049	-0.122*	0.049*	0.123*	-0.576**	0.177*	0.052	-0.270
	(0.135)	(0.058)	(0.003)	(0.004)	(0.558)	(0.349)	(0.288)	(0.099)	(0.101)	(0.068)	(0.048)	(0.058)	(0.937)	(0.701)
-1 to 0	0.032	0.001	-0.038	-0.020	0.070***	0.037**	0.250***	0.211***	-0.048	-0.084	0.019	0.249	0.961**	0.307*
	(0.341)	(0.421)	(0.410)	(0.214)	(0.002)	(0.013)	(0.000)	(0.000)	(0.189)	(0.113)	(0.940)	(0.651)	(0.025)	(0.054)
0 to 1	-0.024	-0.017	0.038	0.007	-0.030*	-0.020	-0.132***	-0.083***	-0.026	-0.014	-0.327*	-0.114*	-0.052	-0.090
	(0.316)	(0.380)	(0.485)	(0.888)	(0.077)	(0.153)	(0.000)	(0.000)	(0.203)	(0.825)	(0.109)	(0.078)	(0.866)	(0.562)
1 to 2	-0.011	0.014	-0.044	-0.000	-0.009	-0.012	0.007	0.009	-0.012	-0.012	-0.117	-0.171	-0.012	-0.1343
	(0.627)	(0.502)	(0.284)	(0.950)	(0.597)	(0.445)	(0.762)	(0.559)	(0.561)	(0.279)	(0.599)	(0.555)	(0.967)	(0.922)
0 - others	0.025	0.009*	-0.038	-0.007	0.043***	0.032***	0.145***	0.111***	0.018	-0.007	0.395**	0.261**	0.122	-0.066
	(0.168)	(0.093)	(0.350)	(0.812)	(0.003)	(0.001)	(0.000)	(0.000)	(0.340)	(0.957)	(0.013)	(0.016)	(0.660)	(0.606)

Table 6.2 (*continued*)

[a]This table reports the test statistics for the paired differences between the year of cross-listing (year 0) and other firm-years (year -2, -1, 1, or 2) in the event window. Panel A presents the U.S. cross-listing sample that comprises 303 firms and 1,167 firm-year observations. Panel B presents the U.K. cross-listing sample that comprises 148 firms and 495 firm-year observations. Return on assets (*ROA*) is defined as earnings before interest and taxes (Compustat item 178) divided by total assets. Cash flows from operations (*CFO*) are operating cash flows shown on the Statement of Cash Flows (Compustat item 308) scaled by total assets. Total accruals (*TA*) are defined as net income before extraordinary items (Compustat item 18) less cash flows from operations (Compustat item 308) scaled by total assets (Compustat item 6). Discretionary accruals (*DA*) are computed as the difference between total accruals and normal accruals, where normal accruals are estimated using the modified Jones model. The absolute value of discretionary accruals (*ABSDA*) is obtained by taking the absolute value of *DA*. Percent operating accruals (*PEROA*) are defined as net income (Compustat item 172) less cash from operations (Compustat item 308), divided by the absolute value of net income. Percent total accruals (*PERTA*) are defined as net income (Compustat item 172) less net cash flow to/from equityholders (purchase of common and preferred stock (Compustat item 115) + cash dividends (Compustat item 127) – sales of common and preferred stock (item 108)) less increase in cash balance (Compustat item 274) , divided by the absolute value of net income. All variables are winsorised at the 5th and 95th percentiles.

[b]The event window spans from two years immediately preceding the cross-listing year and two years immediately after the cross-listing year (year -2 to year 2). “-2 to -1” represents the paired difference between year -1 and year -2 (i.e. value in year -1 subtracts value in year -2), and the rests are defined alike. “Others” refers to the mean value of data for a particular firm in non-cross-listing years (year -2, -1, 1, and 2). Accordingly, “0 – others” refers to the difference between the cross-listing year and the mean value of non-cross-listing years.

[c]P-values for the mean and median differences between the year of cross-listing and other firm-years are derived from paired samples t-tests and Wilcoxon Matched-pairs signed-ranks tests respectively.

[d]*, **, and *** denote significant difference between groups at the 0.10, 0.05, and 0.01 levels, respectively (two-tailed).

In the paired t-tests of difference between the cross-listing year and the mean value of non-cross-listing years (i.e. 0 – others), the results are consistent in showing that firms in the cross-listing year have significantly higher total accruals, percent operating accruals, and percent total accruals than those in the control period at the 1 percent level of significance.

Turning to the U.K. cross-listing sample in Panel B of Table 6.2, the results show strong evidence that managers take income-increasing actions in the cross-listing year. Mean differences in total accruals, signed discretionary accruals, and percent total accruals for the "-1 to 0" interval are positive and significant at at least the 5 percent level, consistent with the manipulation of accruals upwards. From year 0 to year 1, discretionary accruals decrease significantly (p-value = 0.000), which is in line with the conjecture that discretionary accruals reverse in periods subsequent to the cross-listing event.[131]

In the paired t-tests of difference between the cross-listing year and the mean value of non-cross-listing years (i.e. 0 – others), the results are consistent in showing that firms in the cross-listing year have significantly higher total accruals, discretionary accruals, and percent operating accruals than those in the control period at the 1 percent level of significance.[132]

Over the entire event window, there is little evidence suggesting firms attempt to time cross-listing to a period of high performance. For the interval from year -1 to year 0, the mean and median differences in return on assets and operating cash flows are not significant. From year -2 to year -1, there is also a significant decline in the mean and median operating cash flows (-0.078 and -0.027) at the 1 percent level.[133]

[131] This explanation is in line with Sloan's (1996) earning fixation hypothesis which claims that investors fixate on earnings, failing to take into account the fact that accruals tend to reverse and impact future earnings. As a result, cross-listing firms have a strong incentive to use accrual-based earnings management techniques to boost their earnings in the cross-listing period.

[132] The paired difference in percent operating accruals is not statistically significant for the interval from -1 to 0, but decreases significantly for the interval from 0 to 1, which is also consistent with the expectation.

[133] In Chapter 2, it is noted that the U.S. markets use accounting-based rules to select cross-listing candidates while such selection criteria are absent in the U.K. markets. This may partially explain the pattern that *ROA* peaks during the cross-listing event in the U.S. but not in the U.K.

Table 6.3

Correlation Matrix among Dependent and Independent Variables for Testing Hypothesis 1[a]

Variables[b]	*TA*	*DA*	*ABSDA*	*PEROA*	*PERTA*	*CLY*	*SIZE*	*GROWTH*	*SSTK*	*LEV*	*ROA*
Panel A: The U.S. cross-listing sample											
TA		0.052**	-0.020	0.207***	0.143***	0.065**	0.067***	-0.025	0.035	-0.035	0.101***
DA	0.478***		0.266**	0.249***	0.136***	0.002	-0.008	0.026	-0.005	-0.086***	0.051**
ABSDA	-0.130***	-0.265***		0.130***	0.067***	0.006	-0.238***	0.157***	-0.016	-0.097***	-0.083***
PEROA	0.797***	0.420***	0.006		0.243***	0.066**	-0.184***	0.112***	-0.042	-0.167***	0.008
PERTA	0.373***	0.189***	-0.025	0.312***		0.093***	-0.088***	0.118***	0.166***	-0.185***	0.062**
CLY	0.028	0.034	-0.006	0.059**	0.076***		-0.046	0.110***	0.200***	-0.098***	0.044
SIZE	-0.007	0.028	-0.278***	-0.226***	-0.042*	-0.055*		-0.118***	0.280***	0.346***	0.305***
GROWTH	0.055**	0.058**	0.121***	0.144***	0.147***	0.128***	-0.127***		0.051**	-0.042	0.081***
SSTK	0.060**	-0.089***	-0.008	0.050**	0.200***	0.278***	0.198***	0.167***		0.035	0.055**
LEV	-0.128***	0.091***	-0.117***	-0.237***	-0.206***	-0.099***	0.381***	-0.073***	-0.034		-0.026
ROA	0.135***	0.032	-0.109***	0.137***	0.141***	0.023	0.331***	0.201***	0.050**	0.066***	

Table 6.3 (*continued*)

Variables[b]	*TA*	*DA*	*ABSDA*	*PEROA*	*PERTA*	*CLY*	*SIZE*	*GROWTH*	*SSTK*	*LEV*	*ROA*
Panel B: The U.K. cross-listing sample											
TA		0.079***	-0.032	0.212***	0.143***	0.063**	0.063***	-0.016	0.036	-0.042**	0.117***
DA	0.498***		0.182***	0.269***	0.155***	0.092***	-0.008	0.018	0.001	-0.111***	0.079***
ABSDA	-0.148***	-0.265***		0.120***	0.050**	0.022	0.236***	0.146***	-0.024	-0.102***	-0.124***
PEROA	0.796***	0.434***	0.000		0.228***	0.079***	-0.174***	0.088***	-0.037*	-0.163***	-0.004
PERTA	0.396***	0.209***	-0.032	0.322***		0.079***	-0.063***	0.109***	0.157***	-0.189***	0.083***
CLY	0.065***	0.124***	0.005	0.088***	0.076***		-0.059**	0.081***	0.157***	-0.105***	0.029
SIZE	0.012	0.023	-0.275***	-0.216***	-0.016	-0.062**		-0.078***	0.301***	0.318***	0.348***
GROWTH	0.059***	0.030	0.107***	0.111***	0.128***	0.101***	-0.051**		0.052**	-0.010	0.080***
SSTK	0.063***	0.054**	-0.005	0.048**	0.228***	0.207***	0.230***	0.163***		0.035*	0.071**
LEV	-0.140***	-0.111***	-0.115***	-0.232***	-0.215***	-0.105***	0.349***	-0.022	-0.041		-0.019
ROA	0.161***	0.102***	-0.139***	0.093***	0.145***	0.006	0.398***	0.209***	0.041*	0.113***	

[a]This table presents the correlation matrix among the dependent and independent variables used for testing Hypothesis 1. The upper triangle of the table (above the diagonal) shows Pearson correlation coefficients and the lower triangle (below the diagonal) shows Spearman correlation coefficients.

[b] Total accruals (*TA*) are defined as net income before extraordinary items (Compustat item 18) less cash flows from operations (Compustat item 308) scaled by total assets (Compustat item 6). Discretionary accruals (*DA*) are computed as the difference between total accruals and normal accruals, where normal accruals are estimated using the modified Jones model. The absolute value of discretionary accruals (*ABSDA*) is obtained by taking the absolute value of DA. Percent operating accruals (*PEROA*) are defined as net income (Compustat item 172) less cash from operations (Compustat item 308), divided by the absolute value of net income. Percent total accruals (*PERTA*) are defined as net income (Compustat item 172) less net cash flow to/from equityholders (purchase of common and preferred stock (Compustat item 115) + cash dividends (Compustat item 127) – sales of common and preferred stock (item 108)) less increase in cash balance (Compustat item 274) , divided by the absolute value of net income. The indicator of a cross-listing event (*CLY*) equals to 1 for firms in the year of cross-listing (year 0) and 0 otherwise (year -2, -1, 1, or 2). For the control variables, firm size (*SIZE*) is measured by the natural log of total assets, growth (*GROWTH*) is defined as percentage change in sales (Compustat item 12), equity issuance (*SSTK*) is the sales of common and preferred stock (Compustat item 108), financial leverage (*LEV*) is defined as total liabilities (Compustat item 181) divided by total assets, and return on assets (*ROA*) is defined as earnings before interest and taxes (Compustat item 178) divided by total assets. All variables, other than the indicator variable *CLY*, are winsorised at the 5th and 95th percentiles.

[c]*, **, and *** denote significant correlations at the 0.10, 0.05, and 0.01 levels, respectively.

Table 6.3 presents Pearson (above the diagonal) and Spearman (below the diagonal) correlations among the dependent and independent variables used for testing Hypothesis 1. For the U.S. cross-listing sample (Panel A), all the accrual measures (dependent variables), except unsigned discretionary accruals, are positively correlated.[134] Discretionary accruals are highly correlated with total accruals and measures of percent accruals, especially for percent operating accruals, with a Pearson correlation of 0.249 and Spearman correlation of 0.420. Consistent with the expectation, total accruals and percent accruals are positively and significantly correlated with the indicator variable of cross-listing (*CLY*).[135] The measures of accruals, in general, are also highly correlated with the control variables.[136] For the correlations between the control variables, Pearson and Spearman coefficients both indicate significant linear association except leverage for the Pearson correlations. Overall, however, the correlations between the control variables do not appear to indicate significant statistical problems when they are included in the same regression.

For the U.K. cross-listing sample (Panel B), Pearson and Spearman correlations indicate similar patterns. Accrual measures are positively correlated with one another

[134] Unsigned discretionary accruals are expected to be an exception because the use of absolute values affects the direction of correlation between unsigned discretionary accruals and other measures of accruals.

[135] The correlation between the dummy variable *CLY* and other continuous variables in the table is reported by using point-biserial correlation coefficient, which is a special case of the usual Pearson/Spearman correlation formulae.

[136] Equity issuance is an exception when Pearson correlation is examined, as it only significantly correlates to percent total accruals.

and are highly correlated with the indicator variable of cross-listing, with unsigned discretionary accruals being the exception. Compared with other accrual measures, total accruals and signed discretionary accruals appear to have weaker association with the control variables. The associations between the control variables are moderate and do not appear to suggest severe multicollinearity problems.

Table 6.4 provides additional statistics that partition firms in the cross-listing year into IPO and non-IPO firms. It follows from Hypothesis 1c that IPO activities provide foreign issuers with differential incentives to manage earnings upward in the year of cross-listing. Panel A presents the U.S. cross-listing sample that comprises 153 IPO firms and 150 non-IPO firms. Panel B presents the U.K. cross-listing sample that comprises 101 IPO firms and 47 non-IPO firms.

For IPO firms versus non-IPO firms in the U.S. cross-listing sample (Panel A), the sign on the differences for each accrual variable is generally positive and significant using t-tests for independent samples, with discretionary accruals being the only exception. The median difference is also significant for the absolute value of discretionary accruals and percent accruals using the Wilcoxon rank-sum tests. This result gives some indications that IPO firms are more aggressive than non-IPO firms in using accrual-based earnings management.

Table 6.4

Descriptive Statistics of the IPO and Non-IPO Firms in the Cross-listing Year[a]

Variables[b]	IPO firms		Non-IPO firms		Difference (IPO – Non-IPO)	
	Mean	Median	Mean	Median	Mean (t-stat)	Median (z-stat)
Panel A: The U.S. cross-listing sample						
TA	0.055	-0.040	-0.032	-0.039	0.087*	-0.001
					(1.73)	(0.36)
DA	-0.017	-0.019	-0.020	-0.016	0.003	-0.003
					(0.14)	(-0.18)
ABSDA	0.159	0.084	0.067	0.049	0.092***	0.035***
					(5.31)	(5.40)
PEROA	-0.202	-0.323	-0.742	-0.439	0.991**	0.116**
					(2.40)	(2.25)
PERTA	1.208	0.863	0.491	0.297	0.716***	0.566***
					(3.01)	(3.52)
SIZE	6.391	5.976	8.458	8.947	-2.067***	-2.971***
					(-9.14)	(-8.59)
GROWTH	0.296	0.311	0.106	0.117	0.190***	0.194***
					(5.75)	(6.50)
SSTK	179.546	109.901	93.954	5.603	85.591***	104.298***
					(3.22)	(6.71)
LEV	0.353	0.311	0.512	0.524	-0.159***	-0.213***
					(-6.74)	(-6.50)
ROA	0.091	0.089	0.097	0.086	-0.006	0.003
					(-0.23)	(0.55)

Table 6.4 (*continued*)

Variables[b]	IPO firms		Non-IPO firms		Difference (IPO – Non-IPO)	
	Mean	Median	Mean	Median	Mean (t-stat)	Median (z-stat)
Panel B: The U.K. cross-listing sample						
TA	-0.040	-0.020	-0.022	-0.004	-0.018	-0.016
					(-0.65)	(-1.39)
DA	0.084	0.035	0.025	0.024	0.059	0.011
					(1.42)	(0.92)
ABSDA	0.200	0.124	0.192	0.146	0.008	-0.022
					(0.22)	(-0.11)
PEROA	-0.501	-0.177	0.470	-0.054	-0.971***	-0.123**
					(-3.38)	(-2.34)
PERTA	1.439	0.632	1.259	0.769	0.180	-0.137
					(0.37)	(-0.28)
SIZE	4.305	4.205	3.677	3.864	0.628*	0.341
					(1.80)	(1.60)
GROWTH	0.336	0.057	0.216	0.155	0.120	-0.098
					(1.20)	(0.29)
SSTK	26.857	1.399	12.200	1.019	14.656**	0.38
					(2.08)	(1.07)
LEV	0.318	0.280	0.467	0.430	-0.150***	-0.15***
					(-3.22)	(-3.12)
ROA	-0.034	0.012	-0.163	-0.017	0.129**	0.029*
					(2.20)	(1.64)

Table 6.4 (*continued*)

[a]This table presents the descriptive statistics and univariate tests of IPO firms versus non-IPO firms in the year of cross-listing. An IPO firm is one that raises new equity at cross-listing while a non-IPO firm is one that only cross-lists home-country public shares. Panel A presents the U.S. cross-listing sample that comprises 153 IPO firms and 150 non-IPO firms. Panel B presents the U.K. cross-listing sample that comprises 101 IPO firms and 47 non-IPO firms.

[b]Total accruals (*TA*) are defined as net income before extraordinary items (Compustat item 18) less cash flows from operations (Compustat item 308) scaled by total assets (Compustat item 6). Discretionary accruals (*DA*) are computed as the difference between total accruals and normal accruals, where normal accruals are estimated using the modified Jones model. The absolute value of discretionary accruals (*ABSDA*) is obtained by taking the absolute value of DA. Percent operating accruals (*PEROA*) are defined as net income (Compustat item 172) less cash from operations (Compustat item 308), divided by the absolute value of net income. Percent total accruals (*PERTA*) are defined as net income (Compustat item 172) less net cash flow to/from equityholders (purchase of common and preferred stock (Compustat item 115) + cash dividends (Compustat item 127) – sales of common and preferred stock (item 108)) less increase in cash balance (Compustat item 274) , divided by the absolute value of net income. For the control variables, firm size (*SIZE*) is measured by the natural log of total assets, growth (*GROWTH*) is defined as percentage change in sales (Compustat item 12), equity issuance (*SSTK*) is the sales of common and preferred stock (Compustat item 108), financial leverage (*LEV*) is defined as total liabilities (Compustat item 181) divided by total assets, and return on assets (*ROA*) is defined as earnings before interest and taxes (Compustat item 178) divided by total assets. All variables are winsorised at the 5th and 95th percentiles.

[c]*, **, and *** denote significant difference at the 0.10, 0.05, and 0.01 levels, respectively (two-tailed).

Also noticeable are the significant differences in firm size, growth, equity issuance, and leverage. The results indicate, at the 1 percent level of significance, that IPO firms are smaller in size than non-IPO firms (difference = -2.067) but issue more shares (difference = 85.591). IPO firms are not as highly levered as non-IPO firms (difference = -0.159) but their sales grow faster than non-IPO firms (difference = -0.159).[137] These differences indicate that IPO-firms and non-IPO firms are likely to differ in terms of their fundamental firm characteristics such as industry and growth potential. In unreported results for industry distribution of IPO and non-IPO firms,

[137] Independent-sample t-tests for mean difference and Wilcoxon rank-sum tests for median difference provide consistent results at the 1 percent significance level.

IPO firms tend to concentrate in the service industries while non-IPO firms tend to concentrate in the manufacturing and construction industries.

For the U.K. cross-listing sample (Panel B), the difference in accrual variables between IPO and non-IPO firms is not as strong. Only percent operating accruals differs significantly between the two subsamples (difference = -0.971), while the mean and median differences in total accruals, discretionary accruals, and percent total accruals are not statistically significant. In terms of firm characteristics, IPO firms are larger in size than non-IPO firms (difference = 0.628) and issue more shares (difference = 14.656). IPO firms also have lower financial leverage than non-IPO firms (difference = -0.150) but better performance indicated by higher return on assets (difference = 0.129).

6.2.2 Multivariate Analyses

In general, the descriptive statistics and univariate tests provide some support for Hypotheses 1a, 1b, and 1c. However, the univariate tests cannot effectively rule out the possibility that firms may time cross-listings to exploit a potential information advantage or to take advantage of windows of opportunity (Bae et al. 2002).[138] As a result, multivariate analyses are conducted for each proxy of earnings management

[138] This is especially the case for the U.S. cross-listing sample because return on assets peak in the year of cross-listing.

after controlling for firm size, growth, performance, leverage, and equity issuance.

Table 6.5 presents the results from regressing the earnings management metrics (accrual variables and small loss avoidance (*SLA*)) on the indicator variable of cross-listing year and control variables as per Equation 4.6. This model assesses evidence of upward earnings management in the year of cross-listing as compared to the control years (i.e. H_{1a} and H_{1b}). The dependent variables are shown in the first row while the test and control variables are shown in the first column.

For the U.S. cross-listing sample (Panel A), the coefficient β_1 for the indicator variable of cross-listing year (*CLY*) is significantly positive for total accruals only. The result for discretionary accruals is not significant, which follows from the patterns observed in Table 6.1 and Table 6.2 that measures of discretionary accruals peak in year -1 rather than year 0.[139] It should be noted here that total accruals does not measure upward earnings management, and hence the results do not provide direct evidence in support of H_{1a}.

[139] In untabulated sensitivity analyses, year -1 instead of year 0 is used to indicate the year of upward earnings management for firms cross-listing onto the U.S. markets. This additional analysis aims to address the concern that discretionary accruals peak in year -1. The coefficient β_1 is significantly positive (β_1 = 0.046, p-value = 0.005), suggesting evidence in line with the earnings management hypothesis. However, for the purpose of comparing the U.S. and the U.K. cross-listing samples, the results are not reported in the main table.

Table 6.5

Regression Analysis of Earnings Management during the Cross-listing Events (H_{1a} & H_{1b})[a]

Variables[b]	Predicted sign	*TA*	*DA*	*ABSDA*	*PEROA*	*PERTA*	*SLA*[c]
Panel A: The U.S. cross-listing sample (t-statistics in parentheses)							
Intercept		-0.207***	-0.009	0.218***	0.462**	1.349***	-3.869***
		(-2.58)	(-0.34)	(10.11)	(2.18)	(6.65)	(-5.60)
CLY	+	0.105**	-0.001	-0.012	0.175	0.092	-0.023
		(2.18)	(-0.08)	(-0.96)	(1.38)	(0.75)	(-0.06)
SIZE		0.028***	0.003	-0.017***	-0.123***	-0.076***	0.001
		(2.59)	(0.09)	(-6.06)	(-4.36)	(-2.80)	(0.02)
GROWTH		-0.114*	0.038*	0.085***	0.796***	0.452***	-0.031
		(-1.71)	(1.79)	(4.70)	(4.51)	(2.67)	(-0.06)
SSTK		0.000	-0.000	0.001*	-0.001	0.002***	0.000
		(0.12)	(-0.63)	(1.72)	(-0.92)	(7.47)	(0.35)
LEV		-0.190*	-0.032	0.023	-0.783***	-1.028***	0.832
		(-1.79)	(-0.95)	(0.82)	(-2.78)	(-3.81)	(0.94)
ROA		0.132***	-0.008	0.018	0.213	0.200	-0.155
		(-2.58)	(-0.40)	(1.08)	(1.32)	(1.29)	(-0.53)
No. observations		1,167	1,167	1,167	1,167	1,167	1,167
Adjusted/Pseudo R^2		0.016	0.008	0.061	0.071	0.085	0.005

Table 6.5 (*continued*)

Variables[b]	Predicted sign	*TA*	*DA*	*ABSDA*	*PEROA*	*PERTA*	*SLA*[c]
Panel B: The U.K. cross-listing sample (t-statistics in parentheses)							
Intercept		0.002	0.040	0.183***	0.237	1.770***	-4.895***
		(0.13)	(1.44)	(7.46)	(0.98)	(5.63)	(-6.21)
CLY	+	0.033**	0.136***	0.011	0.327*	0.101	-0.282
		(2.52)	(6.55)	(0.60)	(1.79)	(0.43)	(-0.53)
SIZE		-0.006*	-0.015***	0.001	-0.144***	-0.051	0.374***
		(-1.76)	(-2.72)	(0.20)	(-2.90)	(-0.80)	(2.95)
GROWTH		-0.005	-0.007	0.042***	0.086	0.013	-0.203
		(-0.53)	(-0.47)	(3.01)	(0.62)	(0.07)	(-0.45)
SSTK		0.001*	0.000	0.000	0.004*	0.018***	-0.015*
		(1.84)	(1.25)	(0.53)	(1.90)	(7.14)	(-1.71)
LEV		-0.076***	-0.105***	-0.076**	-0.719**	-1.510***	0.866
		(-3.23)	(-2.83)	(-2.31)	(-2.20)	(-3.58)	(0.87)
ROA		0.268***	0.176***	-0.168***	0.123	1.628***	0.951
		(11.56)	(4.78)	(7.46)	(0.38)	(3.90)	(0.74)
No. observations		495	495	495	495	495	495
Adjusted/Pseudo R^2		0.267	0.148	0.070	0.038	0.166	0.109

Table 6.5 (*continued*)

[a]This table reports the results from regressing the earnings management metrics (accruals-based earnings management measures and small loss avoidance) on the indicator variable of cross-listing year and control variables:

$$EM_{i,t} = \beta_0 + \beta_1 CLY_{i,t} + \sum_{k=2}^{n} \beta_k Controls_k + \varepsilon_{i,t} \qquad (4.6)$$

where the earnings management metrics (*EM*) include total accruals (*TA*), discretionary accruals (*DA*), the absolute value of discretionary accruals (*ABSDA*), percent operating accruals (*PEROA*), and percent total accruals (*PERTA*). Control variables (*Controls*) include firm size (*SIZE*), growth (*GROWTH*), equity issuance (*SSTK*), financial leverage (*LEV*), and return on assets (*ROA*). Panel A presents the U.S. cross-listing sample that comprises 303 firms and 1,167 firm-year observations. Panel B presents the U.K. cross-listing sample that comprises 148 firms and 495 firm-year observations.

[b]The dependent variables are shown in the first row. Total accruals (*TA*) are defined as net income before extraordinary items (Compustat item 18) less cash flows from operations (Compustat item 308) scaled by total assets (Compustat item 6). Discretionary accruals (*DA*) are computed as the difference between total accruals and normal accruals, where normal accruals are estimated using the modified Jones model. The absolute value of discretionary accruals (*ABSDA*) is obtained by taking the absolute value of DA. Percent operating accruals are defined as net income (Compustat item 172) less cash from operations (Compustat item 308), divided by the absolute value of net income. Percent total accruals (*PERTA*) are defined as net income (Compustat item 172) less net cash flow to/from equityholders (purchase of common and preferred stock (Compustat item 115) + cash dividends (Compustat item 127) – sales of common and preferred stock (item 108)) less increase in cash balance (Compustat item 274) , divided by the absolute value of net income. Small loss avoidance (*SLA*) is an indicator variable set to 1 if net income scaled by total assets is between 0 and 0.01, and 0 otherwise. The interest and control variables are shown in the first column. The indicator of a cross-listing event (*CLY*) equals to 1 for firms in the year of cross-listing (year 0) and 0 otherwise (year -2, -1, 1, or 2). For the control variables, firm size (*SIZE*) is measured by the natural log of total assets, growth (*GROWTH*) is defined as percentage change in sales (Compustat item 12), equity issuance (*SSTK*) is the sales of common and preferred stock (Compustat item 108), financial leverage (*LEV*) is defined as total liabilities (Compustat item 181) divided by total assets, and return on assets (*ROA*) is defined as earnings before interest and taxes (Compustat item 178) divided by total assets.

[c]Small loss avoidance (*SLA*) is a dependent dummy variable and hence the results reported in the table are based on the logistic algorithm. Pseudo R^2 is constructed using Nagelkerke R^2 because logistic regression does not have a R^2 that is equivalent to those found in OLS regressions.

[d]*, **, and *** denote that the coefficient is statistically different from zero at the 0.10, 0.05, and 0.01 levels, respectively.

The existing literature provides two alternative explanations for high values of accruals surrounding a listing event. On the one hand, cross-listing firms may use accrual-based earnings management techniques to boost their earnings in the listing period (Sloan 1996; Ndubizu 2007). On the other hand, high values of accruals may reflect firms' attempts to time listings to a period when performance peaks (Degeorge and Zeckhauser 1993; Jain and Kini 1994; Pagano et al. 1998).[140] In the latter case, high values of accruals are explained largely by underlying firm- or industry-specific economic events rather than opportunistic earnings management. To address this concern, performance is proxied by return on assets (*ROA*) and is controlled for in the regression model (Equation 4.6). It can be seen that *ROA* is positively and significantly related to total accruals (β = 0.105), and total accruals are significantly higher in the year of cross-listing than the control period after controlling for *ROA* and other firm characteristics.

Overall, the results provide no evidence in support of H_{1a} that cross-listing firms manage earnings upwards in the year of cross-listing for the U.S. sample.

Compared to the regression results from the U.S. cross-listing sample, the explanatory power of the model is greater using the U.K. cross-listing sample (Panel B).[141] The coefficient β_1 for the indicator variable of cross-listing year (*CLY*) is significantly positive for total accruals (0.033), discretionary accruals (0.136), and percent operating accruals (0.327). The positive values imply that accruals are greater

[140] Although the performance issues documented in these studies do not provide direct evidence on cross-listing firms, the evidence covers a variety of listing situations such as IPOs in the U.S. and European countries as well as the going public decisions of leveraged buyouts (LBOs)

[141] The adjusted R^2 for the discretionary accruals model is 0.008 and 0.148 for the U.S. and the U.K. samples, respectively. This raises some concerns about statistical inference that can be made for the discretionary accruals model for the U.S. cross-listing sample. Therefore, I perform an additional analysis of the distribution of the error terms. The residual plots appear to be randomly scattered around zero, suggesting independent data and residuals.

during the cross-listing period (*CLY* = 1) compared to the control period (*CLY* = 0). For example, for the coefficient of discretionary accruals (*DA*), the interpretation is that discretionary accruals are higher in the cross-listing year compared to the control period by 0.136, holding other independent variables constant.

Regarding the control variables, leverage and *ROA* appear to be most significant in influencing accrual measures. Similar to the results from the U.S. cross-listing sample, there is a positive linear relationship between *ROA* and accruals. However, leverage is negatively related to accruals, suggesting that highly levered firms are less likely to manage earnings.

Overall, the results provide weak support to H_{1b} that cross-listing firms manage earnings upwards in the year of cross-listing for the U.K. sample.

Table 6.6 provides results for the IPO versus non-IPO analysis. The regression is performed by regressing the earnings management metrics on the indicator variable of IPO activity and control variables (Equation 4.7). For the U.S. cross-listing sample (Panel A), γ_1 is significantly positive for unsigned discretionary accruals (0.059), but is not significant for other accrual variables. However, unsigned discretionary accruals does not measure upwards earnings management. In comparison, for the U.K. cross-listing sample, γ_1 is significantly negative for both total accruals (-0.073) and percent operating accruals (-1.283).

Table 6.6

Regression Analysis of Earnings Management for IPO Firms versus Non-IPO Firms in the Cross-listing Year (H_{1c})[a]

Variables[b]	Predicted sign	*TA*	*DA*	*ABSDA*	*PEROA*	*PERTA*	*SLA*[c]
Panel A: The U.S. cross-listing sample (t-statistics in parentheses)							
Intercept		-0.010	-0.027	0.105**	1.176**	1.988***	-2.240
		(-0.08)	(-0.49)	(2.50)	(2.23)	(3.64)	(-1.36)
IPO	+/-	0.016	-0.005	0.059***	-0.200	-0.099	-0.479
		(0.26)	(-0.19)	(2.79)	(-0.75)	(-0.36)	(-0.59)
SIZE		-0.007	0.005	-0.004	-0.180***	-0.119*	-0.004
		(-0.49)	(0.78)	(-0.75)	(-2.84)	(-1.81)	(-0.02)
GROWTH		0.240	0.040	0.113***	0.880**	0.462	-0.685
		(2.63)***	(0.96)	(3.58)	(2.21)	(1.12)	(-0.69)
SSTK		0.000	-0.001	-0.001	0.000	0.003***	0.001
		(0.60)	(-0.18)	(-0.14)	(0.58)	(5.18)	(0.68)
LEV		-0.045	-0.077	-0.031	-1.117*	-1.586***	-2.086
		(-0.34)	(-1.28)	(-0.68)	(-1.93)	(-2.65)	(-1.06)
ROA		0.293**	-0.005	-0.017	0.632	0.191	-3.187
		(2.56)	(-0.09)	(-0.42)	(1.27)	(-0.36)	(-1.14)
No. observations		303	303	303	303	303	303
Adjusted/Pseudo R^2		0.054	0.007	0.117	0.095	0.141	0.055

Table 6.6 (*continued*)

Variables[b]	Predicted sign	*TA*	*DA*	*ABSDA*	*PEROA*	*PERTA*	*SLA*[c]
Panel B: The U.K. cross-listing sample (t-statistics in parentheses)							
Intercept		0.114***	0.227***	0.306***	1.814***	2.121***	-4.548***
		(3.50)	(3.60)	(5.58)	(3.89)	(3.35)	(-2.86)
IPO	+/-	-0.073***	0.036	-0.030	-1.283***	-0.653	0.532
		(-3.20)	(0.80)	(-0.77)	(-3.90)	(-1.46)	(0.45)
SIZE		-0.004	-0.029**	-0.013	-0.135	-0.037	0.118
		(-0.71)	(-2.40)	(-1.26)	(-1.51)	(-0.31)	(0.44)
GROWTH		-0.013	0.012	0.055**	0.117	0.260	0.703
		(-0.79)	(0.38)	(2.03)	(0.51)	(0.84)	(1.00)
SSTK		0.000	0.000	0.001*	0.002	0.025***	-0.006
		(0.35)	(0.18)	(1.80)	(0.57)	(5.55)	(-0.54)
LEV		-0.158***	-0.177**	-0.178**	-1.603***	-1.818**	0.346
		(-3.74)	(-2.16)	(-2.48)	(-2.64)	(-2.21)	(0.16)
ROA		0.270***	0.099	0.020	0.894	1.450*	1.858
		(6.66)	(1.26)	(0.30)	(1.54)	(1.83)	(0.62)
No. observations		148	148	148	148	148	148
Adjusted/Pseudo R^2		0.287	0.079	0.076	0.112	0.247	0.060

Table 6.6 (*continued*)

[a]This table reports the results from regressing the earnings management metrics (accruals-based earnings management measures and small loss avoidance) on the indicator variable of IPO activity and control variables:

$$EM_i = \gamma_0 + \gamma_1 IPO_i + \sum_{k=2}^{n} \gamma_k Controls_k + \varepsilon_i \qquad (4.7)$$

where the earnings management metrics (*EM*) include total accruals (*TA*), discretionary accruals (*DA*), the absolute value of discretionary accruals (*ABSDA*), percent operating accruals (*PEROA*), and percent total accruals (*PERTA*). Control variables (*Controls*) include firm size (*SIZE*), growth (*GROWTH*), equity issuance (*SSTK*), financial leverage (*LEV*), and return on assets (*ROA*). Panel A presents the U.S. cross-listing sample that comprises 153 IPO firms and 150 non-IPO firms. Panel B presents the U.K. cross-listing sample that comprises 101 IPO firms and 47 non-IPO firms.

[b]The dependent variables are shown in the first row. Total accruals (*TA*) are defined as net income before extraordinary items (Compustat item 18) less cash flows from operations (Compustat item 308) scaled by total assets (Compustat item 6). Discretionary accruals (*DA*) are computed as the difference between total accruals and normal accruals, where normal accruals are estimated using the modified Jones model. The absolute value of discretionary accruals (*ABSDA*) is obtained by taking the absolute value of DA. Percent operating accruals are defined as net income (Compustat item 172) less cash from operations (Compustat item 308), divided by the absolute value of net income. Percent total accruals (*PERTA*) are defined as net income (Compustat item 172) less net cash flow to/from equityholders (purchase of common and preferred stock (Compustat item 115) + cash dividends (Compustat item 127) – sales of common and preferred stock (item 108)) less increase in cash balance (Compustat item 274) , divided by the absolute value of net income. Small loss avoidance (*SLA*) is an indicator variable set to 1 if net income scaled by total assets is between 0 and 0.01, and 0 otherwise. The interest and control variables are shown in the first column. The indicator of IPO activity (*IPO*) equals to 1 for firms that raise new equity capital at cross-listing and 0 otherwise. For control variables, firm size (*SIZE*) is measured by the natural log of total assets, growth (*GROWTH*) is defined as percentage change in sales (Compustat item 12), equity issuance (*SSTK*) is the sales of common and preferred stock (Compustat item 108), financial leverage (*LEV*) is defined as total liabilities (Compustat item 181) divided by total assets, and return on assets (*ROA*) is defined as earnings before interest and taxes (Compustat item 178) divided by total assets. All variables, other than the indicator variable *IPO*, are winsorised at the 5th and 95th percentiles.

[c]Small loss avoidance (*SLA*) is a dependent dummy variable and hence the results reported in the table are based on the logistic algorithm. Pseudo R^2 is constructed using Nagelkerke R^2 because logistic regression does not have a R^2 that is equivalent to those found in OLS regressions.

[d]*, **, and *** denote that the coefficient is statistically different from zero at the 0.10, 0.05, and 0.01 levels, respectively.

The mixed directions of the γ_1 coefficient are consistent with the issues raised in developing H_{1c} (Section 3.2 of Chapter 3). While a cash injection is likely to provide an incentive for IPO firms to boost earnings, firms are likely to be concerned about future earnings and post-IPO returns, which are affected by the levels of earnings management in the listing year.

Overall, the results from the U.K. sample provide weak support to the alternative form of H_{1c} that IPO firms and non-IPO firms engage in different levels of earnings management in the year of cross-listing, and no evidence of upwards earnings management is found for the U.S. sample.

6.3 Hypothesis 2

6.3.1 Univariate Analyses

Hypothesis 2 addresses the bonding hypothesis by examining whether cross-listing firms have better earnings quality than their home-country firms that are not cross-listed. Based on the matching procedure proposed by Lang et al. (2003a), non-cross-listing firms are selected to form the control samples. The initial U.S. cross-listing sample consists of 327 unique firms with 3,645 firm-year observations, and 327 firm-year observations are lost in computing variables that require lagged data. In the matching process, an additional 356 firm-year observations are deleted for which data in the control sample are not available.[142] This leaves the U.S.

[142] For a particular cross-listing firm, if an industry match cannot be found, the entire time-series data of the firm are deleted from the final sample. If an industry match can be found but the match for a particular year cannot be found, only the firm-year observation for that particular year is deleted from the final sample.

cross-listing sample with 324 unique firms and 2,962 firm-year observations.[143] The initial U.K. cross-listing sample consists of 176 unique firms with 1,184 firm-year observations, and 176 observations are lost in constructing lagged variables. An additional 305 observations are deleted as a result of the matching process, leaving the U.K. cross-listing sample with 116 unique firms and 703 firm-year observations.[144]

Table 6.7 summarises the descriptive statistics (mean and median) and the results of univariate tests for the U.S. cross-listing pair (Panel A) and the U.K. cross-listing pair (Panel B). The purpose of the univariate tests is to compare cross-listing firms with non-cross-listing firms in terms of their earnings quality and firm characteristics.

For the U.S. cross-listing pair (Panel A), the mean difference between the cross-listing sample and the control sample is significantly negative for total accruals (*TA*), signed discretionary accruals (*DA*), and unsigned discretionary accruals (*ABSDA*) at the 1 percent level under both the t-tests and Wilcoxon tests. This difference suggests that earnings quality appears to be higher for firms cross-listed in the U.S. Since the measures of earnings quality are accrual-based, the result also implies a higher risk of earnings management being present for non-cross-listing firms.

[143] The control sample for the U.S. comprises 1238 unique firms with 2,962 firm-year observations. The difference between the cross-listing sample and the control sample in the number of unique firms is due to the fact that the cross-listing sample comprises time-series firm data while the control sample consists mostly of cross-sectional firm-year observations. It should also be noted that some firm-year observations are used more than once for a match.

[144] The control sample for the U.K. comprises 355 unique firms with 703 firm-year observations. Similar to that for the U.S. sample, some firm-year observations are used more than once for a match.

Table 6.7

Descriptive Statistics of Cross-listing versus Non-cross-listing Firms[a]

Variables[b]	Cross-listing firms (C)		Non-cross-listing firms (N)		Differences (C – N)	
	Mean	Median	Mean	Median	Mean (t-stat)	Median (z-stat)
Panel A: The U.S. sample						
TA	-0.048	-0.044	-0.040	-0.034	-0.008*** (-3.55)	-0.010*** (-7.18)
DA	-0.025	-0.020	-0.006	-0.007	-0.019*** (-6.53)	-0.013*** (-6.415)
ABSDA	0.082	0.057	0.094	0.067	-0.012*** (-5.45)	-0.010*** (-5.91)
PEROA	-1.157	-0.653	-2.318	-0.540	1.161*** (10.86)	-0.113*** (-5.90)
PERTA	0.512	0.471	0.247	0.640	0.265*** (4.70)	-0.169*** (-4.69)
SIZE	7.955	8.086	7.023	6.950	0.932*** (13.96)	1.136*** (9.90)
GROWTH	0.223	0.127	0.165	0.100	0.058*** (6.36)	0.027 (0.93)
SSTK	54.849	2.791	8.022	0.000	46.827*** (-13.60)	2.791*** (27.28)
LEV	0.264	0.243	0.496	0.499	-0.232*** (-22.09)	-0.256*** (-35.89)
ROA	0.077	0.079	0.047	0.034	0.030*** (5.54)	0.045*** (16.68)
Panel B: The U.K. sample						
TA	-0.070	-0.048	-0.055	-0.040	-0.015** (-2.04)	-0.008 (-1.42)
DA	-0.060	-0.047	-0.030	-0.015	-0.030*** (-3.58)	-0.032*** (-21.17)
ABSDA	0.162	0.107	0.122	0.089	0.040*** (5.84)	0.018*** (20.63)

Table 6.7 (*continued*)

Variables[b]	Cross-listing firms (C)		Non-cross-listing firms (N)		Differences (C – N)	
	Mean	Median	Mean	Mean	Mean (t-stat)	Median (z-stat)
PEROA	-1.088	-0.508	-0.912	-0.536	-0.176 (-1.39)	0.028 (-0.40)
PERTA	1.168	0.665	0.853	0.531	0.315** (2.17)	0.134** (2.06)
SIZE	4.514	4.368	5.862	5.862	-1.348*** (-12.00)	-1.494*** (-11.21)
GROWTH	0.537	0.138	0.196	0.105	0.341*** (6.45)	0.033** (2.4)
SSTK	15.693	0.157	12.641	0.027	3.052 (1.63)	0.130* (1.76)
LEV	0.455	0.443	0.422	0.411	0.033** (2.52)	0.032** (2.33)
ROA	-0.035	0.034	-0.009	0.000	-0.026*** (-2.88)	0.034*** (3.93)

[a]This table presents the descriptive statistics and univariate tests of cross-listing firms versus a matched sample of home-country firms that are not cross-listed. For every cross-listing firm year, I find a matched firm year that is in the same home country, year, industry group (based on the two-digit SIC code) and. has the closest value of growth. Panel A presents the U.S. cross-listing sample that comprises 324 cross-listing firms (2,962 firm-year observation) and 1,238 non-cross-listing firms (2,962 firm-year observations). Panel B presents the U.K. cross-listing sample that comprises 116 cross-listing firms (703 firm-year observation) and 355 non-cross-listing firms (703 firm-year observations).

[b]Total accruals (*TA*) are defined as net income before extraordinary items (Compustat item 18) less cash flows from operations (Compustat item 308) scaled by total assets (Compustat item 6). Discretionary accruals (*DA*) are computed as the difference between total accruals and normal accruals, where normal accruals are estimated using the modified Jones model. The absolute value of discretionary accruals (*ABSDA*) is obtained by taking the absolute value of DA. Percent operating accruals (*PEROA*) are defined as net income (Compustat item 172) less cash from operations (Compustat item 308), divided by the absolute value of net income. Percent total accruals (*PERTA*) are defined as net income (Compustat item 172) less net cash flow to/from equityholders (purchase of common and preferred stock (Compustat item 115) + cash dividends (Compustat item 127) – sales of common and preferred stock (item 108)) less increase in cash balance (Compustat item 274) , divided by the absolute value of net income. For the control variables, firm size (*SIZE*) is measured by the natural log of total assets, growth (*GROWTH*) is defined as percentage change in sales (Compustat item 12), equity issuance (*SSTK*) is the sales of common and preferred stock (Compustat item 108), financial leverage (*LEV*) is defined as total liabilities (Compustat item 181) divided by total assets, and return on assets (*ROA*) is defined as earnings before interest and taxes (Compustat item 178) divided by total assets. All variables are winsorised at the 5th and 95th percentiles.

[c]*, **, and *** denote significant difference at the 0.10, 0.05, and 0.01 levels, respectively (two-tailed).

Different from the traditional accrual measures, the difference in percent accruals (*PEROA* and *PERTA*) between the two samples is significant at the 1 percent level but the directions are mixed for means and medians. The median difference in percent accruals is negative and is in line with traditional accruals. The mean difference, however, is positive and suggests the opposite. The observed contradiction in mean and median differences for percent accruals is attributable to skewness.[145]

For the U.K. cross-listing pair (Panel B), the mean difference between the cross-listing sample and the control sample is significantly negative for total accruals and signed discretionary accruals, whereas the difference is significantly positive for unsigned discretionary accruals and percent total accruals. An interpretation for the result is that signed discretionary accruals provide some indication as to income-increasing versus income-decreasing earnings management techniques while unsigned discretionary accruals can indicate managers' accounting discretion in manipulating accruals that may lead to less informative earnings. Therefore, the descriptive results do provide conclusive evidence on the difference in earnings quality between firms cross-listed in the U.K. and non-cross-listing firms.

[145] In unreported analysis of variable distribution, accrual variables for the U.S. cross-listing sample exhibit similar skewness. For the control sample, however, percent operating accruals (*PEROA*) and percent total accruals (*PERTA*) exhibit significantly higher skewness (skew statistics of -2.75 and -0.81) compared to the traditional accrual measures (skew statistics are approximately between -0.10 and 0.10) .

Table 6.7 also presents descriptive data on firm characteristics. On average, firms cross-listed in the U.S. market are significantly larger in size (*SIZE*) than firms in the control sample (difference = 0.932), while firms cross-listed in the U.K. market are significantly smaller in size than the control sample (difference = -1.348). This is partially due to the different listing thresholds imposed by the U.S. and the U.K. markets on foreign issuers. The minimum market capitalisation requirement is much higher in the U.S. than in the U.K., which tends to exclude small and non-profitable companies from the U.S. markets.[146]

Firms cross-listed in the U.S. markets appear to be more profitable than their matched sample in terms of *ROA* (difference = 0.030), while firms cross-listed in the U.K. markets appear to be less profitable than their matched sample (difference = -0.026).[147] In terms of leverage (*LEV*), firms cross-listed in the U.S. use more equity financing than the control group (difference = -0.232), while firms cross-listed in the U.K. use more debt financing (difference = 0.033). This is supported by pecking order theory that profitability and debt ratios are negatively correlated.

[146] As discussed in Chapter 2, foreign issuers on the London Main Market are covered by the Standard Listings Regime, which requires a minimum of £0.7 million market capitalisation. This threshold is much lower than that imposed by the NYSE and NASDAQ Global Select, which requires the foreign issuers to have a minimum capital market capitalisation of $US500 million and $550 million, respectively.

[147] Untabulated results also show that cross-listing firms have lower asset turnovers than firms in the control sample. This may reflect the difficulties and complexity to effectively coordinate and utilise assets for the large multinational cross-listing firms.

Cross-listing firms and non-cross-listing firms also differ in terms of sales growth (*GROWTH*) as cross-listing firms experience faster sales growth than the matched sample for both the U.S. and the U.K. markets (difference = 0.058 and 0.341, respectively). While this result is consistent with the argument that cross-listing firms pursue the rapid expansion strategy with high growth rates and large equity issues (Pagano et al. 2002), the difference in growth prospects raises some concerns about the effectiveness of the matching procedure that matches firms on sales growth.[148] Therefore, sales growth is still included as a control variable in the multivariate analyses even though it has been used as one of the matching criteria.

Table 6.8 presents Pearson (above the diagonal) and Spearman (below the diagonal) correlations among the dependent and independent variables used for testing Hypothesis 2.[149] For the U.S. data (Panel A), all the accrual measures are significantly correlated, which means that they are capturing the quality of accounting information in a similar way.

[148] Using the same matching procedure, Lang et al. (2003a) also report significantly higher sales growth rate for cross-listing firms than for non-cross-listing firms.

[149] The cross-listing sample and the control sample are pooled together for the U.S. and the U.K. data respectively to compute correlation coefficients.

Table 6.8

Correlation Matrix among Dependent and Independent Variables for Testing Hypothesis 2[a]

Variables[b]	*TA*	*DA*	*ABSDA*	*PEROA*	*PERTA*	*XLIST*	*SIZE*	*GROWTH*	*SSTK*	*LEV*	*ROA*
Panel A: The U.S. sample											
TA		0.547***	-0.150***	0.236***	0.237***	-0.046***	0.084***	0.081***	0.087***	-0.123***	0.243***
DA	0.545***		-0.168***	0.126***	0.126***	-0.087***	0.089***	0.030**	0.070***	-0.071***	0.220***
ABSDA	-0.130***	-0.175***		0.030***	-0.013	-0.074***	-0.072***	0.115***	-0.041***	-0.043***	-0.176***
PEROA	0.694***	0.379***	0.017		0.377***	0.137***	-0.138***	0.074***	0.068***	-0.069***	0.123***
PERTA	0.357***	0.215***	-0.056***	0.362***		0.060***	-0.052***	0.082***	0.058***	-0.063***	0.124***
XLIST	-0.084***	-0.087***	-0.076***	-0.067***	-0.022*		0.177***	0.083***	-0.244***	-0.279***	0.071***
SIZE	0.029**	0.072***	-0.064***	-0.146***	-0.009	0.188***		-0.100***	0.404***	-0.045***	0.108***
GROWTH	0.096***	0.046***	0.088***	0.121***	0.115***	0.051***	-0.045***		-0.015	-0.032**	0.047***
SSTK	0.193***	0.105***	-0.040***	0.225***	0.265***	-0.198***	0.350***	0.105***		0.070***	0.173***
LEV	-0.038***	-0.069***	-0.043***	-0.075***	-0.059***	-0.519***	-0.007	-0.057***	0.084***		-0.120***
ROA	0.146***	0.171***	-0.042***	0.328***	0.231***	0.255***	0.136***	0.200***	0.341***	-0.208***	

Table 6.8 (*continued*)

Variables[b]	*TA*	*DA*	*ABSDA*	*PEROA*	*PERTA*	*XLIST*	*SIZE*	*GROWTH*	*SSTK*	*LEV*	*ROA*
Panel B: The U.K. sample											
TA		0.524***	-0.280***	0.360***	0.262***	-0.054**	0.185***	-0.013	0.082***	-0.157***	0.496***
DA	0.537***		-0.373**	0.237***	0.188***	-0.087***	0.012	0.006	0.051**	-0.148***	0.237***
ABSDA	-0.212***	-0.322***		0.004	-0.015	0.133***	-0.133***	0.079***	0.039	-0.016	-0.231***
PEROA	0.780***	0.417***	-0.060**		-0.001	-0.037	-0.091***	0.069***	0.022	-0.153***	-0.038
PERTA	0.372***	0.239***	-0.068***	0.217***		0.058**	0.029	0.052*	0.287***	-0.118***	0.148***
XLIST	-0.038	-0.089***	0.100***	-0.011	0.055**		-0.305***	0.169***	0.043	0.067**	-0.077***
SIZE	0.113***	-0.002	-0.106***	-0.086***	0.059**	-0.300***		-0.089***	0.283***	0.121***	0.346***
GROWTH	0.088***	0.041	0.017	0.096***	0.121***	0.064**	-0.018		0.150***	-0.014	-0.059**
SSTK	-0.013	0.03	0.052**	0.028	0.217***	0.047*	0.124***	0.188***		-0.078***	0.046*
LEV	-0.160***	-0.138***	-0.025	-0.205***	-0.128***	0.062**	0.149***	0.011	-0.084***		-0.009
ROA	0.286***	0.146***	-0.150***	0.064**	0.229***	0.105***	0.229***	0.143***	-0.070***	0.078***	

[a]This table presents the correlation matrix among the dependent and independent variables used for testing Hypothesis 2. The upper triangle of the table (above the diagonal) shows Pearson correlation coefficients and the lower triangle (below the diagonal) shows Spearman correlation coefficients.

[b] Total accruals (*TA*) are defined as net income before extraordinary items (Compustat item 18) less cash flows from operations (Compustat item 308) scaled by total assets (Compustat item 6). Discretionary accruals (*DA*) are computed as the difference between total accruals and normal accruals, where normal accruals are estimated using the modified Jones model. The absolute value of discretionary accruals (*ABSDA*) is obtained by taking the absolute value of DA. Percent operating accruals (*PEROA*) are defined as net income (Compustat item 172) less cash from operations (Compustat item 308), divided by the absolute value of net income. Percent total accruals (*PERTA*) are defined as net income (Compustat item 172) less net cash flow to/from equityholders (purchase of common and preferred stock (Compustat item 115) + cash dividends (Compustat item 127) – sales of common and preferred stock (item 108)) less increase in cash balance (Compustat item 274) , divided by the absolute value of net income. The indicator of cross-listing (*XLIST*) equals to 1 for a cross-listing firm and 0 otherwise. For the control variables, firm size (*SIZE*) is measured by the natural log of total assets, growth (*GROWTH*) is defined as percentage change in sales (Compustat item 12), equity issuance (*SSTK*) is the sales of common and preferred stock (Compustat item 108), financial leverage (*LEV*) is defined as total liabilities (Compustat item 181) divided by total assets, and return on assets (*ROA*) is defined as earnings before interest and taxes (Compustat item 178) divided by total assets. All variables, other than the indicator variable *XLIST*, are winsorised at the 5th and 95th percentiles.

[c]*, **, and *** denote significant correlations at the 0.10, 0.05, and 0.01 levels, respectively.

The correlations between accrual variables are negative only for unsigned discretionary accruals, indicating that unsigned discretionary accruals tend to measure the extent of managerial reporting discretion or the general propensity to manage earnings (e.g. Dechow and Dichev 2002; Frankel, Johnson, and Nelson 2002; Hribar and Nichols 2007). Consistent with the expectation, discretionary accruals are negatively and significantly correlated with the indicator variable of cross-listing (*XLIST*), with a Pearson correlation and Spearman correlation of -0.087. The Pearson correlations between the accrual variables and the control variables (firm size, growth, equity issuance, leverage, and return on assets) are all significant at the 1 percent level, and most of the Spearman correlations between the accrual variables and the control variables are also significant.[150] This result suggests the importance of controlling for the firm characteristics in the multivariate analyses.

The correlations between accrual variables for the U.K. sample (Panel B) reveal similar patterns. An exception is that discretionary accruals are not significantly related to some of the control variables (size and growth). Overall, the correlations between the control variables do not appear to indicate severe multicollinearity issues.

[150] The only exception is the correlation between percent total accruals and firm size.

6.3.2 Multivariate Analyses

In general, the descriptive statistics and univariate tests provide some support for Hypothesis 2a and 2c that cross-listing firms have better earnings quality than their home-country counterparts that are not cross-listed. The results for the U.S. pair and the U.K. pair are as hypothesised when signed discretionary accruals are used to proxy for earnings quality. Some issues arise when percent accruals and unsigned discretionary accruals are examined, which entails the need for multivariate analyses.

Table 6.9 presents the results from regressing the earnings management metrics (accruals-based earnings management measures and small loss avoidance) on the indicator variable of cross-listing, after controlling for firm size, growth, performance, leverage, and equity issuance (Equation 4.8). This model assesses earnings quality of cross-listing firms as compared to non-cross-listing firms in the matched control sample.

For the U.S. pair (Panel A), the coefficient θ_1 is significantly negative for total accruals (-0.023), signed discretionary accruals (-0.015), and unsigned discretionary accruals (-0.035) at the 1 percent level of significance. These results follow from the patterns observed in Table 6.7 that earnings quality is higher for firms cross-listed in the U.S. than for home-country firms that are not cross-listed. However, for percent accruals, the coefficient θ_1 is significant but in the opposite direction.

Table 6.9

Earnings Quality of Cross-listing versus Non-cross-listing Firms (H_{2a} & H_{2c})[a]

Variables[b]	Predicted sign	*TA*	*DA*	*ABSDA*	*PEROA*	*PERTA*	*SLA*[c]
Panel A: The U.S. cross-listing sample (t-statistics in parentheses)							
Intercept		-0.057***	-0.007	0.144***	0.518***	0.872***	-3.855***
		(-13.17)	(-1.07)	(28.44)	(2.65)	(8.34)	(-18.01)
XLIST	-	-0.023***	-0.015***	-0.035***	1.936***	0.386***	-1.454***
		(-8.56)	(-3.48)	(-11.13)	(16.05)	(5.99)	(10.21)
SIZE		0.003***	0.001	-0.007***	-0.481***	-0.109***	0.210***
		(6.02)	(1.40)	(-10.66)	(-19.24)	(-8.15)	(8.29)
GROWTH		0.022***	0.001	0.037***	0.299**	0.348***	-0.928***
		(6.78)	(0.13)	(8.33)	(2.54)	(4.50)	(-4.04)
SSTK		-0.001	0.000	0.000***	0.001***	0.001***	-0.001**
		(-0.39)	(0.71)	(2.77)	(15.00)	(7.49)	(-2.22)
LEV		-0.029***	-0.029***	-0.007	-0.234*	-0.209***	0.174**
		(-9.45)	(-4.13)	(-1.26)	(-1.71)	(-2.86)	(2.15)
ROA		0.101***	0.148***	-0.073***	1.961***	1.113***	-0.493
		(17.53)	(12.93)	(-8.16)	(7.49)	(7.95)	(-1.52)
No. observations		5,924	5,924	5,924	5,924	5,924	5,924
Adjusted/Pseudo R^2		0.088	0.044	0.055	0.098	0.037	0.086

Table 6.9 (*continued*)

Variables[b]	Predicted sign	*TA*	*DA*	*ABSDA*	*PEROA*	*PERTA*	*SLA*[c]
Panel B: The U.K. cross-listing sample (t-statistics in parentheses)							
Intercept		-0.026**	0.060***	0.125***	0.171	1.646***	-3.295***
		(-2.3)	(4.09)	(10.28)	(0.77)	(6.71)	(-8.28)
XLIST	-	-0.001	-0.032***	0.030***	-0.333**	0.192	0.100
		(-0.13)	(-3.49)	(3.99)	(-2.49)	(1.30)	(0.43)
SIZE		0.002	-0.009***	-0.002	-0.103***	-0.113***	0.117**
		(0.89)	(-4.11)	(-1.17)	(-3.03)	(-3.04)	(2.07)
GROWTH		0.001	-0.004	0.020***	0.151**	0.004	-0.322*
		(0.44)	(-0.52)	(3.19)	(2.37)	(0.06)	(-1.70)
SSTK		0.001	0.001**	0.001*	0.002	0.023***	-0.003
		(1.61)	(2.53)	(1.90)	(1.16)	(10.92)	(-0.79)
LEV		-0.086***	-0.089***	0.003	-1.280***	-0.933***	0.228
		(-6.49)	(-5.18)	(0.22)	(-4.96)	(-3.28)	(0.49)
ROA		0.402***	0.256***	-0.157***	-0.128	2.718***	1.474*
		(19.8)	(10.63)	(-7.90)	(-0.32)	(6.24)	(1.65)
No. observations		1,406	1,406	1,406	1,406	1,406	1,406
Adjusted/Pseudo R^2		0.269	0.094	0.074	0.033	0.116	0.024

Table 6.9 (*continued*)

[a]This table reports the results from regressing the earnings quality metrics (accruals-based earnings management measures and small loss avoidance) on the indicator variable of cross-listing and control variables:

$$EM_{i,t} = \theta_0 + \theta_1 XLIST_{i,t} + \sum_{k=2}^{n} \theta_k Controls_k + \varepsilon_{i,t} \qquad (4.8)$$

where the earnings management metrics (*EM*) include total accruals (*TA*), discretionary accruals (*DA*), the absolute value of discretionary accruals (*ABSDA*), percent operating accruals (*PEROA*), and percent total accruals (*PERTA*). Control variables (*Controls*) include firm size (*SIZE*), growth (*GROWTH*), equity issuance (*SSTK*), financial leverage (*LEV*), and return on assets (*ROA*). Panel A presents the U.S. cross-listing sample that comprises 324 cross-listing firms (2,962 firm-year observation) and 1,238 non-cross-listing firms (2,962 firm-year observations). Panel B presents the U.K. cross-listing sample that comprises 116 cross-listing firms (703 firm-year observation) and 355 non-cross-listing firms (703 firm-year observations).

[b]The dependent variables are shown in the first row. Total accruals (*TA*) are defined as net income before extraordinary items (Compustat item 18) less cash flows from operations (Compustat item 308) scaled by total assets (Compustat item 6). Discretionary accruals (*DA*) are computed as the difference between total accruals and normal accruals, where normal accruals are estimated using the modified Jones model. The absolute value of discretionary accruals (*ABSDA*) is obtained by taking the absolute value of DA. Percent operating accruals are defined as net income (Compustat item 172) less cash from operations (Compustat item 308), divided by the absolute value of net income. Percent total accruals (*PERTA*) are defined as net income (Compustat item 172) less net cash flow to/from equityholders (purchase of common and preferred stock (Compustat item 115) + cash dividends (Compustat item 127) – sales of common and preferred stock (item 108)) less increase in cash balance (Compustat item 274) , divided by the absolute value of net income. Small loss avoidance (*SLA*) is an indicator variable set to 1 if net income scaled by total assets is between 0 and 0.01, and 0 otherwise. The interest and control variables are shown in the first column. The indicator of cross-listing (*XLIST*) equals to 1 for a cross-listing firm and 0 otherwise. For control variables, firm size (*SIZE*) is measured by the natural log of total assets, growth (*GROWTH*) is defined as percentage change in sales (Compustat item 12), equity issuance (*SSTK*) is the sales of common and preferred stock (Compustat item 108), financial leverage (*LEV*) is defined as total liabilities (Compustat item 181) divided by total assets, and return on assets (*ROA*) is defined as earnings before interest and taxes (Compustat item 178) divided by total assets. All variables, other than the indicator variable *XLIST*, are winsorised at the 5th and 95th percentiles.

[c]Small loss avoidance (*SLA*) is a dependent dummy variable and hence the results reported in the table are based on the logistic algorithm. Pseudo R^2 is constructed using Nagelkerke R^2 because logistic regression does not have a R^2 that is equivalent to those found in OLS regressions.

[d]*, **, and *** denote that the coefficient is statistically different from zero at the 0.10, 0.05, and 0.01 levels, respectively.

Consistent with Lang et al. (2003a), the θ_1 coefficient is also significantly negative at the 1 percent level when the regression is estimated with small loss avoidance (*SLA*). It indicates that there are a smaller proportion of cross-listing firms reporting small positive earnings compared to the control sample of the non-cross-listing firms, holding other control variables constant. The θ_1 coefficient estimate of -1.454 corresponds to an odds ratio of 0.234, which suggests that non-cross-listing firms in the control sample are 4.28 times more likely to report small positive earnings than firms cross-listed in the U.S.[151] Combined with the findings that discretionary accruals are higher for non-cross-listing firms relative to cross-listing firms, the result on small loss avoidance provides evidence that non-cross-listing firms are more likely to boost discretionary accruals to avoid reporting a loss.

For the control variables, signed discretionary accruals are significantly associated with leverage and return on assets, while unsigned discretionary accruals are significantly associated with size, growth, equity issuance, and return on assets. Including these firm characteristics as control variables alleviates the concern that the correlation between discretionary accruals and firm characteristics may lead to an over-rejection of the null hypothesis (i.e. earnings quality is the same for cross-listing firms and non-cross-listing firms).

In summary, the results are mixed for H_{2a}, which states that firms that cross-list their stocks in the U.S. have better earnings quality than the home-country firms that

[151] The odds ratio is computed by exponentiating the θ_1 coefficient.

are not cross-listed. While all 6 regressions produce significant θ_1 coefficients, for 2 out of the 6 regressions the θ_1 coefficient is significant in the wrong direction.

For the U.K. pair (Panel B), the θ_1 coefficient is significantly negative for signed discretionary accruals (-0.032) and percent operating accruals (-0.035) at the 1 percent and 5 percent significance level, respectively. The unsigned discretionary accruals, however, is higher for cross-listing firms than for non-cross-listing firms. It follows from the patterns observed for the univariate tests that signed discretionary accruals and unsigned discretionary accruals capture different aspects of earnings quality. The negative (positive) θ_1 coefficient for signed (unsigned) discretionary accruals suggests that firms cross-listed in the U.K., compared to their home-country counterparts, are less likely to engage in income-increasing earnings management, but are more likely to manage earnings in the absence of a specific directional prediction.

Different from the results provided in the U.S. sample, when the regression is estimated with small loss avoidance (*SLA*), θ_1 is not statistically significant for the U.K. sample. This shows that non-cross-listing firms in the control sample are not more likely to report small positive earnings than firms cross-listed in the U.K.

Overall, the results from the U.K. cross-listing sample provide weak support to H_{2c}, which states that firms that cross-list their stocks in the U.K. have better earnings quality than the home-country firms that are not cross-listed.

Table 6.10

Effects of SOX on Earnings Quality of Cross-listing versus Non-cross-listing Firms in the U.S. (H_{2b})[a]

Variables[b]	Predicted sign	*TA*	*DA*	*ABSDA*	*PEROA*	*PERTA*	*SLA*[c]
Intercept		-0.043***	-0.011	0.131***	0.775***	1.113***	-3.415***
		(-8.55)	(-1.46)	(22.41)	(3.40)	(9.18)	(-15.76)
XLIST	-	-0.024***	0.007	-0.033***	1.177***	0.097	-0.649***
		(-5.91)	(1.16)	(-7.23)	(6.22)	(0.97)	(-3.95)
SOX	-	-0.017***	0.005	0.016***	-0.691***	-0.408***	-0.468***
		(-5.02)	(1.14)	(4.38)	(-4.35)	(-4.83)	(-3.53)
*XLIST * SOX*	-	0.004	-0.033***	0.001	0.680***	0.318***	0.208
		(0.75)	(-5.48)	(0.05)	(3.01)	(2.64)	(0.98)
SIZE		0.003	0.001	-0.007***	-0.419***	-0.096***	0.188***
		(0.75)	(1.55)	(-10.38)	(17.37)	(-7.51)	(8.10)
GROWTH		0.023***	0.003	0.035***	0.395***	0.388***	-0.616***
		(7.23)	(0.51)	(7.78)	(2.71)	(4.99)	(-3.34)
SSTK		0.000	0.000	0.000***	0.001***	0.001***	-0.001*
		(0.85)	(0.73)	(2.77)	(11.46)	(6.05)	(-1.90)
LEV		-0.029***	-0.031***	-0.005	-0.245*	-0.218***	0.141*
		(-9.65)	(-4.41)	(-0.90)	(-1.78)	(-2.98)	(1.76)

Table 6.10 (*continued*)

Variables[b]	Predicted sign	*TA*	*DA*	*ABSDA*	*PEROA*	*PERTA*	*SLA*[c]
ROA		0.101***	0.147***	-0.073***	2.486***	1.259***	-0.943***
		(17.82)	(12.92)	(-8.22)	(9.56)	(9.11)	(-2.95)
No. observations		5,924	5,924	5,924	5,924	5,924	5,924
Adjusted/Pseudo R^2		0.094	0.053	0.063	0.087	0.038	0.047

[a]This table reports the results from regressing the earnings quality metrics (accruals-based earnings management measures and small loss avoidance) on the indicator variables of cross-listing and SOX as well as the control variables:

$$EM_{i,t} = \mu_0 + \mu_1 XLIST_{i,t} + \mu_2 SOX_{i,t} + \mu_3 XLIST_{i,t} \times SOX_{i,t} + \sum_{k=1}^{n} \mu_k Controls_k + \varepsilon_{i,t} \qquad (4.9)$$

where the earnings management metrics (*EM*) include total accruals (*TA*), discretionary accruals (*DA*), the absolute value of discretionary accruals (*ABSDA*), percent operating accruals (*PEROA*), and percent total accruals (*PERTA*). Control variables (*Controls*) include firm size (*SIZE*), growth (*GROWTH*), equity issuance (*SSTK*), financial leverage (*LEV*), and return on assets (*ROA*). The regression is based on the U.S. cross-listing sample, consisting of 324 cross-listing firms (2,962 firm-year observations) and 1,238 non-cross-listing firms (703 firm-year observations).

[b] Total accruals (*TA*) are defined as net income before extraordinary items (Compustat item 18) less cash flows from operations (Compustat item 308) scaled by total assets (Compustat item 6). Discretionary accruals (*DA*) are computed as the difference between total accruals and normal accruals, where normal accruals are estimated using the modified Jones model. The absolute value of discretionary accruals (*ABSDA*) is obtained by taking the absolute value of DA. Percent operating accruals are defined as net income (Compustat item 172) less cash from operations (Compustat item 308), divided by the absolute value of net income. Percent total accruals (*PERTA*) are defined as net income (Compustat item 172) less net cash flow to/from equityholders (purchase of common and preferred stock (Compustat item 115) + cash dividends (Compustat item 127) – sales of common and preferred stock (item 108)) less increase in cash balance (Compustat item 274) , divided by the absolute value of net income. Small loss avoidance (*SLA*) is an indicator variable set to 1 if net income scaled by total assets is between 0 and 0.01, and 0 otherwise. The indicator of cross-listing (*XLIST*) equals to 1 for a cross-listing firm and 0 otherwise. SOX (*SOX*) is an indicator variable that equals to 1 if the year of observation is after 2002, and 0 otherwise. *XLIST * SOX* is an interactive term representing the product of the *XLIST* and *SOX*. For control variables, firm size (*SIZE*) is measured by the natural log of total assets, growth (*GROWTH*) is defined as percentage change in sales (Compustat item 12), equity issuance (*SSTK*) is the sales of common and preferred stock (Compustat item 108), financial leverage (*LEV*) is defined as total liabilities (Compustat item 181) divided by total assets, and return on assets (*ROA*) is defined as earnings before interest and taxes (Compustat item 178) divided by total assets. All variables, other than the indicator variables *XLIST* and *SOX*, are winsorised at the 5th and 95th percentiles.

[c]Small loss avoidance (*SLA*) is a dependent dummy variable and hence the results reported in the table are based on the logistic algorithm. Pseudo R^2 is constructed using Nagelkerke R^2 because logistic regression does not have a R^2 that is equivalent to those found in OLS regressions.

[d]*, **, and *** denote that the coefficient is statistically different from zero at the 0.10, 0.05, and 0.01 levels, respectively.

Table 6.10 reports the results from regressing the earnings quality metrics on the indicator variables of U.S. cross-listing and the indicator variable of SOX (Equation 4.9). This model investigates the impacts of SOX on cross-listing firms, with the expectation that the difference in earnings quality between cross-listing firms and non-cross-listing firms is greater in the post-SOX period than in the pre-SOX period. Everything else being equal, I expect μ_1, μ_2, and μ_3 to be significantly negative because they are differential intercept coefficients that show the difference in earnings quality between cross-listing firms and non-cross-listing firms. In particular, H_{2b} is supported if μ_3 is significantly negative.

As shown in Table 6.10, the coefficient μ_3 is significantly negative for signed discretionary accruals (-0.033) at the 1 percent level of significance. This suggests that firms cross-listed in the U.S. in the post-SOX period have significantly less evidence of earnings management than non-cross-listing firms and cross-listing firms in the pre-SOX period. It is also important to note that μ_1 and μ_2 are not significant for the same regression using discretionary accruals as the dependent variable. It means that cross-listing choices or the passage of SOX alone do not provide sufficient incentives for foreign firms to improve earnings quality. It is the combined effect of cross-listing and SOX that creates strong incentives for cross-listing firms to commit to better accounting practices.

In contrast, the *SLA* regression shows significant μ coefficients for the indicator variables *XLIST* (-0.649) and *SOX* (-0.468), while the μ coefficient for the interaction term is not significant. Therefore, the cross-listing choice and the passage of SOX each has significant impacts on reducing firms' tendency to report small positive earnings, but SOX does not have additional impacts on cross-listing firms' tendency to report small positive earnings.

Overall, the regression results have important implications for the effectiveness of SOX on cross-listing firms. The findings provide some support to H_{2b} that the difference in earnings quality between firms cross-listed in the U.S. and the home-country firms not cross-listed in the U.S. is greater in the post-SOX period than in the pre-SOX period.

Table 6.11 presents the results from testing Hypothesis 2d, which investigates earnings quality of cross-listing versus non-cross-listing firms in relation to cross-listing destinations. This hypothesis is tested by comparing θ_1 obtained from Equation 4.8 based on the U.S. pair ($\theta_{1,US}$) and U.K. pair ($\theta_{1,UK}$). An independent sample t-test is performed for each measure of earnings quality.[152]

[152] Ideally, this analysis would jointly test the U.S. and the U.K. samples in one regression model. The power of the test could have been strengthened by pooling the U.S. and U.K. cross-listing and control samples together and interact *XLIST* with *US_UK*. When such attempts are made, there appears to be a collinearity issue. Specifically, there are four subsamples involved: US cross-listing (*XLIST* = 1, *US_UK* = 0), UK cross-listing (*XLIST* = 1, *US_UK* = 1), U.S. control (*XLIST* = 0, *US_UK* = 0), and U.K. control (*XLIST* = 0, *US_UK* = 1). It can be seen that *XLIST* and *US_UK* overlap for two out of the four subsamples. Therefore, only a simple t-test is employed to test Hypothesis 2d.

Table 6.11

Earnings Quality of Cross-listing versus Non-cross-listing Firms in relation to Cross-listing Destinations (H_{2d})[a]

Variables[b]	Predicted Sign	U.S.		U.K.		Differences ($\theta_{1,US} - \theta_{1,UK}$)	
		$\theta_{1,US}$	SE.	$\theta_{1,UK}$	SE	Diff.	p-value
TA	-	-0.023	0.003	-0.001	0.007	-0.022***	0.000
DA	-	-0.015	0.004	-0.032	0.009	0.017***	0.000
ABSDA	-	-0.035	0.003	0.030	0.008	-0.065***	0.000
PEROA	-	1.936	0.117	-0.333	0.134	2.269***	0.000
PERTA	-	0.386	0.062	0.192	0.148	0.194***	0.000
SLA	-	-1.454	0.007	0.100	0.014	-1.554***	0.000

[a]This table presents the results from testing Hypothesis 2d, which examines the relationship between cross-listing destinations and earnings quality. The θ coefficients are obtained from Equation 4.8, where $\theta_{1,US}$ and $\theta_{1,UK}$ are based on regressions of the U.S. sample and the U.K. sample, respectively. An independent sample t-test is performed for each measure of earnings quality, and p-values are reported in the table.

[b]Total accruals (*TA*) are defined as net income before extraordinary items (Compustat item 18) less cash flows from operations (Compustat item 308) scaled by total assets (Compustat item 6). Discretionary accruals (*DA*) are computed as the difference between total accruals and normal accruals, where normal accruals are estimated using the modified Jones model. The absolute value of discretionary accruals (*ABSDA*) is obtained by taking the absolute value of DA. Percent operating accruals (*PEROA*) are defined as net income (Compustat item 172) less cash from operations (Compustat item 308), divided by the absolute value of net income. Percent total accruals (*PERTA*) are defined as net income (Compustat item 172) less net cash flow to/from equityholders (purchase of common and preferred stock (Compustat item 115) + cash dividends (Compustat item 127) – sales of common and preferred stock (item 108)) less increase in cash balance (Compustat item 274) , divided by the absolute value of net income. Small loss avoidance (*SLA*) is an indicator variable set to 1 if net income scaled by total assets is between 0 and 0.01, and 0 otherwise.

All variables are winsorised at the 5th and 95th percentiles.

[c]*, **, and *** denote significant difference at the 0.10, 0.05, and 0.01 levels, respectively (two-tailed).

The results show that the θ_1 coefficient is significantly different between the U.S. pair and the U.K. pair for all measures of earnings quality at the 1 percent level of significance. The U.S. pair has significantly lower θ_1 coefficient than the U.K. pair for total accruals (difference = -0.022), unsigned discretionary accruals (difference = -0.065), and small loss avoidance (-1.554). This indicates that the differences in firms' general propensity to manage earnings and to avoid losses are greater for the U.S. pair than for the U.K. pair.

However, the U.S. pair has significantly higher θ_1 coefficient than the U.K. pair for signed discretionary accruals (difference = 0.017), percent operating accruals (difference = 2.269), and percent total accruals (0.194). This suggests that the difference in evidence of income-increasing earnings management is greater for the U.K. pair than for the U.S. pair.

Overall, due to the mixed directions of θ_1 differences (i.e. $\theta_{1,US} - \theta_{1,UK}$), I cannot reject the null hypothesis for H_{2d} that whether a firm cross-lists in the U.S. or the U.K. has no impact on the differences in earnings quality between the cross-listing firms and their home-country counterparts.

6.4 Hypothesis 3

6.4.1 Univariate Analyses

Hypothesis 3 makes a direct comparison between firms cross-listed on the U.S. markets and firms cross-listed on the U.K. markets with respect to their earnings quality. The main theme behind the comparison is the bonding hypothesis and the presumption in favour of the view that the U.S. markets provide a better bonding mechanism to improve earnings quality than the U.K. markets. To test the differential impact of the cross-listing choices on earnings quality, I only consider cross-listing firms in their post-listing periods.

As documented in Chapter 5, the initial U.S. cross-listing sample consists of 327 unique firms with 3,645 firm-year observations. I first exclude 1,458 firm-year observations that are in the pre-listing period. Then, the data set for testing Hypothesis 3 is obtained by combining data in the World Economic Outlook (WEO) database with the post-listing sample[153]. No data are lost during the merging process as all the required macroeconomic data are available from the WEO database. In constructing variables that explain cross-listing choices (Stage-One variables), however, 322 firm-year observations are lost due to the use of lagged data. The final U.S. cross-listing sample consists of 322 unique firms with 1,865 firm-year observations.

The initial U.K. cross-listing sample consists of 176 unique firms with 1,184 firm-year observations. I first exclude 86 firm-year observations that are in the pre-listing period. Then, relevant macroeconomic data in the WEO database are merged into the U.K. cross-listing sample with no data loss. An additional 176 observations are lost in constructing lagged variables, leaving the U.K. cross-listing

[153] The WEO database is used to gather data on inflation rate, total exports, percentage of exports going to the U.S. or the U.K., and GNP per capita. Data on the WEO database are available from 1980 to the present, which fully cover the sample period from 1989 to 2001.

sample with 168 unique firms and 922 firm-year observations.

It should be noted that time-series properties of earnings (i.e. earnings persistence, predictability, and smoothness) are also included in the hypothesis testing, but are based on smaller samples that meet the time-series data requirements. In particular, the U.S. cross-listing sample includes 94 unique firms with 473 firm-year observations and the U.K. cross-listing sample includes 37 unique firms with 202 firm-year observations. Results based on smaller samples are likely to introduce survivorship bias and hence must be interpreted with caution.

Table 6.12 summarises the descriptive statistics (mean and median) and the results of univariate tests (independent sample t-tests and Wilcoxon rank-sum tests) of the variables used for testing Hypothesis 3. Measures of earnings quality (dependent variables), determinants of cross-listing choices (Stage-One variables), and control variables (Stage-Two variables) are reported in Panel A, B, and C, respectively.

If there is a gap in earnings quality as hypothesised, firms cross-listed in the U.K. are expected to have higher accruals (total and discretionary) than firms cross-listed in the U.S. However, the univariate tests produce mixed results. As shown in Panel A, for all five measures of accrual, the mean differences between the U.S. and the U.K. cross-listing samples are statistically significant at the 1 percent level of significance but the signs are mixed. Consistent with the expectation, the mean differences in unsigned discretionary accruals, percent operating accruals, and percent total accruals between the U.S. and the U.K. samples are -0.063, -0.206, and -0.630, respectively. The negative signs suggest that firms cross-listed in the U.S. engage in less accrual-based earnings management than do firms cross-listed in the U.K.

In comparison, total accruals and signed discretionary accruals are more negative for firms cross-listed in the U.K. than for firms cross-listed in the U.S. There appears to be some skewness issues for total accruals since the Wilcoxon test does not report significant differences in medians. Signed discretionary accruals are lower for firms cross-listed in the U.K. (-0.061) than for firms cross-listed in the U.S. (-0.034), suggesting less of a tendency for firms cross-listed in the U.K. to manage earnings upwards than firms cross-listed in the U.S. However, this evidence is not conclusive as previous studies suggest a positive association between performance and Jones model estimates of discretionary accruals (e.g. Kasznik 1999; Kothari et al. 2005). Consistent with this conjecture, Panel C shows that firms cross-listed in the U.S. have significantly better return on assets than firms cross-listed in the U.K. (difference = 0.127), and therefore the higher discretionary accruals of cross-listing firms in the U.S. may be tied to their better performance. As a result, the correlation between performance and discretionary accruals needs to be further investigated to understand the mixed evidence provided by signed and unsigned discretionary accruals.

Table 6.12

Descriptive Statistics of Firms Cross-listed in the U.S. versus Firms Cross-listed in the U.K. in the Post-listing Period[a]

Variables	Cross-listing firms (U.S.)		Cross-listing firms (U.K.)		Differences (U.S. – U.K.)	
	Mean	Median	Mean	Median	Mean (t-stat)	Median (z-stat)
Panel A: Measures of earnings quality[b]						
TA	-0.049	-0.046	-0.073	-0.040	0.024*** (6.08)	-0.006 (0.26)
DA	-0.034	-0.026	-0.061	-0.049	0.027*** (4.84)	0.023*** (4.10)
ABSDA	0.086	0.062	0.149	0.107	-0.063*** (-16.18)	-0.045*** (-12.78)
PEROA	-1.109	-0.601	-0.903	-0.480	-0.206*** (-2.71)	-0.121*** (-4.47)
PERTA	0.528	0.448	1.158	0.590	-0.630*** (-7.41)	-0.142*** (-3.39)
PERSISTENCE	0.266	0.241	0.296	0.195	-0.030 (-0.53)	0.046 (1.08)
PREDICT1	0.068	0.035	0.127	0.043	-0.059** (-2.44)	-0.008*** (-3.30)
PREDICT2	0.063	-0.051	0.057	-0.089	0.006 (0.23)	0.038 (0.42)
SMOOTHNESS	1.305	0.941	1.619	1.207	-0.314** (-2.45)	-0.266*** (-3.65)
Panel B: Determinants of cross-listing choice (Stage-One variables)[c]						
GROWTH_OPPR	0.160	0.097	0.264	0.067	-0.104*** (-6.49)	0.030 (0.27)
ECO_PROX	0.295	0.134	0.091	0.047	0.204*** (18.07)	0.087*** (21.39)

Table 6.12 (*continued*)

Variables	Cross-listing firms (U.S.)		Cross-listing firms (U.K.)		Differences (U.S. – U.K.)	
	Mean	Median	Mean	Median	Mean (t-stat)	Median (z-stat)
GEO_PROX	6.885	6.190	6.705	5.810	0.180 (1.14)	0.380*** (5.56)
ECO_DEV	9.903	10.435	10.449	10.557	-0.546*** (-15.90)	-0.122*** (-10.65)
DIFF_GAAP	5.578	4.000	6.008	6.000	-0.430** (-2.19)	-2.000** (-2.57)
Panel C: Control variables (Stage-Two variables)[d]						
SIZE	7.824	7.828	4.679	4.580	3.145*** (37.72)	3.248*** (29.80)
GROWTH	0.192	0.130	0.271	0.070	-0.079*** (-4.43)	0.060 (1.39)
SSTK	64.779	2.674	14.931	0.403	49.848*** (10.00)	2.271*** (6.82)
LEV	0.445	0.450	0.426	0.412	0.019** (2.09)	0.038*** (2.79)
ROA	0.045	0.053	-0.082	0.001	0.127*** (18.86)	0.052*** (15.80)

[a]This table presents the descriptive statistics and univariate tests of firms cross-listed in the U.S. versus firms cross-listed in the U.K. in the post-listing period. The U.S. cross-listing sample comprises 322 unique cross-listing firms (1,865 firm-year observations) and the U.K. cross-listing sample comprises 168 unique cross-listing firms (922 firm-year observations). Time-series properties of earnings are based on a smaller sample of 94 firms cross-listed in the U.S. (473 firm-year observations) and 37 firms cross-listed in the U.K. (202 firm-year observations). Statistics on the measures of earnings quality, determinants of cross-listing choice, and control variables are reported in Panel A, B, and C, respectively.

[b]Earnings persistence (*PERSISTENCE*) is measured by the slope coefficient that measures the strength of the linear association between current earnings (Compustat item 18) and earnings in the period immediately before the earnings period. The first measure of earnings predictability (*PREDICT1*) is the square root of error variance in the equation used to estimate persistence, and the second measure of earnings predictability (*PREDICT2*) is the adjusted R^2 obtained from the same equation. Earnings smoothness (*SMOOTHNESS*) is defined as the standard deviation of net income before extraordinary items (Compustat item 18) divided by the standard deviation of cash flows from operations (Compustat item 308), both of which are scaled by beginning total assets. All other measures of earnings quality are as defined before.

[c]For the Stage-One variables, I define growth opportunity (*GROWTH_OPPR*) as 2-year geometric average of annual inflation-adjusted growth in sales, economic proximity (*ECO_PROX*) as the percentage of home country's exports going to the U.S., geographic proximity (*GEO_PROX*) as the Great Circle Distance from the capital city of the home country to the capital city of the U.S. (i.e. Washington, D.C.), economic development (*ECO_DEV*) as the log GNP per capita in home country, and GAAP differences (*DIFF_GAAP*) as the GAAP difference score constructed by Bae et al. (2008).

[d]All control variables are as defined before.

[e]*, **, and *** denote significant difference at the 0.10, 0.05, and 0.01 levels, respectively (two-tailed).

Earnings quality of firms cross-listed in the U.S. and the U.K. also differs in terms of predictability and smoothness. The square root of error variance (*PREDICT1*) is significantly larger for the U.K. sample (0.127) as compared to the U.S sample (0.068), indicating that firms cross-listed in the U.K. on average have high variation in current earnings that cannot be explained or predicted by previous earnings. For earnings smoothness (*SMOOTHNESS*), firms cross-listed in the U.S. have more smoothed earnings as measured by the standard deviation of earnings to the standard deviation of cash flows. If firms smooth earnings so as to appeal to investors who desire stable earnings, the earnings stream, though less variable, is likely to reflect earnings management.

Panel B of Table 6.12 presents the five variables used in the first stage of the Heckman procedure to control for firms' self-selection to cross-list on the U.S. or the U.K. stock market. Cross-listing firms in both the U.S. and the U.K. samples experience a high double-digit growth as measured by firms' 2-year geometric average of annual inflation-adjusted growth in sales (*GROWTH_OPPR*). Firms cross-listed on the U.K. markets, on average, face greater growth opportunities than firms cross-listed on the U.S. markets (difference = 10.4 percent). The high growth in sales experienced by cross-listing firms is consistent with the notion that firms with growth opportunities are likely to seek external financing to fund such opportunities.

An internal obstacle to cross border raising of capital is the perceived increase in cost of consuming private benefits following a cross-listing on a stringent market. However, the controlling shareholders would be strongly encouraged to forgo private benefits of control if the need for external financing to fund growth opportunities is greater (Doidge et al. 2009b). Consistent with this conjecture, cross-listing firms in both the U.S. and the U.K. are observed to exhibit high growth opportunities.

Economic proximity (*ECO_PROX*) is measured by the percentage of the home country's exports going to the U.S. market.[154] Firms cross-listed on the U.S. markets are typically domiciled in countries which have a larger percentage of exports going to the U.S. (29.5 percent) than firms cross-listed on the U.K. markets (9.1 percent), and this difference is significant at the 1 percent level. Geographic proximity (*GEO_PROX*), however, does not appear to be an important determinant of the cross-listing choice because a mean difference between the two cross-listing samples is not observed while the significant median difference may indicate data skewness.

Economic development in the home country (*ECO_DEV*) is measured by the log of GNP per capita. Firms cross-listed in the U.K., on average, have better economic development status than firms cross-listed in the U.S. (difference = -0.546). This difference may reflect the preference of EU countries for a U.K. listing due to their

[154] Exports used to construct the measure of economic proximity include all goods leaving the economic territory of the home country. The exported goods are valued at FOB (free on board) prices.

strong economic links (Piotroski and Srinivasan 2008). This is also consistent with the country distribution reported in Chapter 5, where the U.K. sample has a wider coverage of the EU member states.

GAAP differences (*DIFF_GAAP*) across countries are measured using Bae et al.'s (2008) country score. The score has a theoretical maximum value of 21 and minimum value of 0, where higher scores represent greater deviations from IAS. On average, firms cross-listed on the U.K. markets are domiciled in countries whose local GAAP differs more from IAS than firms cross-listed on the U.S. markets (mean difference = -0.430; median difference = -2.000).

With regard to the results for the control variables in Panel C of Table 6.12, firms cross-listed in the U.K. on average are smaller but grow faster than firms cross-listed in the U.S. However, firms cross-listed in the U.K. perform poorly as indicated by the negative value of return on assets. In support of the bonding hypothesis, Lel and Miller (2008) report that firms cross-listed on the major U.S. exchanges are more likely to terminate poorly performing CEOs than non-cross-listing firms while such higher propensity is not observed for U.K. cross-listings. In the post-listing period, firms cross-listed in the U.S. also issue more equity than firms cross-listed in the U.K. The voluntary imposition of bonding mechanism by controlling shareholders signals a reduced risk of expropriation and is likely to lead to a lower cost of capital (Reese and

Weisbach 2002; Lins, Strickland, and Zenner 2005).

Table 6.13 presents Pearson (above the diagonal) and Spearman (below the diagonal) correlations among the dependent and independent variables used for testing Hypothesis 3. Panel A reports variables included in the main multivariate test where cross-sectional measures of earnings quality are used as dependent variables. Panel B reports correlations between cross-sectional measures of earnings quality and time-series properties of earnings.

In previous results (i.e. Table 6.3 and Table 6.8), the correlations between accrual variables and firm characteristics are presented separately for the U.S. and U.K. samples. In Panel A, I pool the two samples together and include an indicator variable of the cross-listing destination (*US_UK*) to examine correlations among the variables. The accrual variables, except unsigned discretionary accruals, are positively related to one another at the 1 percent level of significance, suggesting that they capture a similar aspect of earnings quality. The absolute value of discretionary accruals is negatively related to the other four accrual variables, and this is mainly attributable to the presence of large negative discretionary accruals in the data.

Table 6.13

Correlation Matrix among Dependent and Independent Variables for Testing Hypothesis 3[a]

Variables[b]	*TA*	*DA*	*ABSDA*	*PEROA*	*PERTA*	*US_UK*	*SIZE*	*GROWTH*	*SSTK*	*LEV*	*ROA*
Panel A: Cross-sectional measures of earnings quality, interest variable, and control variables											
TA		0.523***	-0.334***	0.417***	0.293***	-0.115***	0.144***	0.057***	0.071***	-0.127***	0.570***
DA	0.500***		-0.490***	0.249***	0.189***	-0.092***	0.059***	0.014	0.023	-0.124***	0.283***
ABSDA	-0.189***	-0.374***		-0.011	-0.024	0.293***	-0.300***	0.119***	-0.043**	-0.039**	-0.327***
PEROA	0.773***	0.391***	-0.041**		0.138***	0.051***	-0.143***	0.105***	0.010	-0.162***	0.034*
PERTA	0.390***	0.230***	-0.047**	0.277***		0.139***	-0.062***	0.134***	0.150***	-0.135***	0.137***
US_UK	-0.005	-0.078***	0.242***	0.085***	0.064***		-0.582***	0.084***	-0.186***	-0.040**	-0.337***
SIZE	0.004	0.036*	-0.259***	-0.195***	0.001	-0.565***		-0.058***	0.315***	0.297***	0.456***
GROWTH	0.113***	0.048**	0.039**	0.124***	0.173***	-0.026	0.019		0.075***	-0.036*	0.053***
SSTK	0.073***	0.022	0.005	0.089***	0.198***	-0.129***	0.240***	0.163***		0.057***	0.102***
LEV	-0.116***	-0.112***	-0.058***	-0.210***	-0.136***	-0.053***	0.344***	-0.020	0.004		-0.063***
ROA	0.293***	0.182***	-0.150***	0.275***	0.211***	-0.300***	0.354***	0.250***	0.098***	-0.059***	

Table 6.13 (*continued*)

Variables[b]	*TA*	*DA*	*ABSDA*	*PEROA*	*PERTA*	*PERSISTENCE*	*PREDICT1*	*PREDICT2*	*SMOOTHNESS*	*US_UK*
Panel B: Cross-sectional measures of earnings quality and time-series properties of earnings										
TA		0.002	0.098**	-0.006	-0.006	-0.059	0.062	-0.007	0.072*	0.169***
DA	0.293***		-0.570***	0.050	0.040	-0.188***	-0.062	-0.017	-0.048	-0.122***
ABSDA	0.032	-0.441***		-0.027	-0.027	0.134***	0.177***	0.004	0.151***	0.295***
PEROA	0.597***	0.345***	-0.060		0.963***	-0.028	-0.001	-0.029	-0.005	-0.064*
PERTA	0.227***	0.209***	0.011	0.258***		-0.013	-0.008	-0.014	-0.003	-0.039
PERSISTENCE	-0.140***	-0.053	-0.007	-0.073*	-0.117***		0.245***	0.458***	0.058	0.021
PREDICT1	0.301***	-0.048	0.157***	0.070*	-0.069*	-0.149***		-0.074*	0.262***	0.094**
PREDICT2	-0.068*	-0.006	0.001	-0.048	-0.037	0.637***	-0.313***		-0.123***	-0.009
SMOOTHNESS	0.111***	-0.034	0.108***	0.000	-0.035	-0.097**	0.636***	-0.185***		0.094**
US_UK	0.235***	-0.098**	0.246***	-0.064*	0.112***	-0.042	0.127***	-0.016	0.141***	

[a]This table presents the correlation matrix among the dependent and independent variables used for testing Hypothesis 3. The upper triangle of the table (above the diagonal) shows Pearson correlation coefficients and the lower triangle (below the diagonal) shows Spearman correlation coefficients. The U.S. cross-listing sample comprises 322 unique cross-listing firms (1,865 firm-year observations) and the U.K. cross-listing sample comprises 168 unique cross-listing firms (922 firm-year observations). Time-series properties of earnings are based on a smaller sample of 94 firms cross-listed in the U.S. (473 firm-year observations) and 37 firms cross-listed in the U.K. (202 firm-year observations).

[b] The cross-listing destination (*US_UK*) is an indicator variable that equals to 1 if a firm is cross-listed on the U.K. markets and 0 if a firm is cross-listed on the U.S. markets. Other variable definitions are provided in the footnotes of Table 6.12. All variables, other than the indicator variable *US_UK*, are winsorised at the 5th and 95th percentiles.

[c]*, **, and *** denote significant correlations at the 0.10, 0.05, and 0.01 levels, respectively.

Correlations among control variables appear to be modest. Only the correlation between firm size and return on assets is relatively high, with a Pearson correlation of 0.456 and Spearman correlation of 0.354. However, given the importance of firm size and growth in explaining accrual variables, both variables are retained as controls. Other correlations among control variables provide some additional insights into characteristics of cross-listing firms. For example, firm size is negatively related to growth with a Pearson correlation of -0.058, indicating that smaller firms grow faster than larger ones.

Time-series properties of earnings supplement the accrual variables used in this thesis to measure earnings quality. As shown in Panel B of Table 6.13, the Pearson correlations (in absolute value) among these earnings attributes range from 0.058 to 0.458 and the Spearman correlations (in absolute value) range from 0.097 to 0.637, suggesting that the strength of association varies. Consistent with Francis et al. (2004), Pearson correlations show that earnings persistence is positively associated with earnings predictability. Smoothness, however, is negatively related to persistence as indicated by the Spearman correlation of -0.097.[155] Since larger values of smoothness indicate less earnings smoothness, the negative correlation suggests that firms with

[155] Spearman correlation only provides some indication of the negative association between persistence and smoothness since no significant Pearson correlation is found between these two earnings attributes.

less smooth earnings have less persistent earnings, although the magnitude of correlation does not appear to be significant in economic terms. The negative correlation between smoothness and other earnings attributes is also reported in the recent earnings quality study conducted by Dechow et al. (2010). To the extent that earnings smoothing is a special form of earnings management, the implications of high persistence and high predictability need to be carefully interpreted.[156]

6.4.2 Multivariate Analyses

In general, the descriptive statistics and univariate tests show that firms cross-listed in the U.S. and U.K. differ in accruals (total and discretionary) and other earnings attributes. Firms cross-listed in the U.K. have significantly higher unsigned discretionary accruals as hypothesised, but lower signed discretionary accruals than firms cross-listed in the U.S. The mixed directions of the t-tests entail the need for multivariate analyses, especially to address the concern that significant correlations between performance and accruals may be an explanation for the mixed results.

Table 6.14 presents the results from the first stage of the Heckman procedure (Equation 4.10). The first stage of the Heckman procedure is a selection model used to estimate firms' decision to cross-list their stocks in the U.S. or the U.K. stock

[156] Early discussion of managers' motives to engage in income smoothing can be found in Trueman and Titman (1988).

exchange markets.

The coefficient estimates also produce several interesting findings. First, the positive coefficient on growth opportunities (0.544) suggests that an increase in a firm's growth opportunities is associated with an increase in the predicted probability of that firm cross-listed in the U.K. markets. Recalling from Table 6.13, high-growth firms tend to be small ones (i.e. a negative Pearson correlation between firm size and growth). The positive coefficient on growth opportunities hence gives some indications that the U.K. markets attract small, high-growth firms.

Second, macroeconomic factors play an important role in explaining firms' choices between the U.S. and the U.K. markets. The coefficient on home-country economic development is 0.586 while the coefficient on economic proximity is -2.572, both of which are significant at the 1 percent level. These findings are not surprising because economic proximity is defined as the percentage of a firm's home country exports going to the U.S. Hence, as a firm's economic proximity to the U.S. gets closer, the predicted probability of that firm cross-listed in the U.K. markets decreases. For economic development, firms from EU countries are heavily represented in the U.K. sample, which explains the positive coefficient in the probit model.

Table 6.14

Determinants of Cross-listing Choice (H_3: Stage One of the Heckman Procedure)[a]

Variables[b]	Predicted sign	Coefficient	Standard error	z-statistic[c]	p-value (two-tailed)
Intercept		-5.887***	0.519	-11.34	0.000
GROWTH_OPPR	+/-	0.544***	0.072	7.57	0.000
ECO_PROX	-	-2.572***	0.177	-14.57	0.000
GEO_PROX	+	-0.004	0.007	-0.52	0.600
ECO_DEV	+	0.586***	0.048	12.19	0.000
DIFF_GAAP	+/-	-0.020***	0.006	-3.50	0.000
No. Observations	2,787				
LR statistic	-1,434.42				
Pseudo R^2	0.208				

[a]This table reports the results from the first stage of the Heckman's procedure. The first stage of the Heckman procedure is a selection model used to estimate firms' decision to cross-list their stocks in the U.S. or the U.K. stock exchange market:

$$US\_UK_{i,t} = \pi_0 + \pi_1 GROWTH\_OPPR_{i,t} + \pi_2 ECO\_PROX_{i,t} + \pi_3 GEO\_PROX_{i,t} + \pi_4 ECO\_DEV_{i,t} + + \pi_5 DIFF\_GAAP_{i,t} + u_{i,t} \qquad (4.10)$$

The probit regression is based on a pooled sample of firms cross-listed in the U.S. (322 unique firms with 1865 observations) and firms cross-listed in the U.K. (168 unique firms with 922 observations).

[b]I define growth opportunity (*GROWTH_OPPR*) as 2-year geometric average of annual inflation-adjusted growth in sales, economic proximity (*ECO_PROX*) as the percentage of home country's exports going to the U.S., geographic proximity (*GEO_PROX*) as the Great Circle Distance from the capital city of the home country to the capital city of the U.S. (i.e. Washington, D.C.), economic development (*ECO_DEV*) as the log GNP per capita in home country, and GAAP differences (DIFF_GAAP) as the GAAP difference score constructed by Bae et al. (2008). The cross-listing destination (*US_UK*) is an indicator variable that equals to 1 if a firm is cross-listed on the U.K. markets and 0 if a firm is cross-listed on the U.S. markets. All variables, other than the indicator variable *US_UK*, are winsorised at the 5th and 95th percentiles.

[c]The LR statistics(i.e. -2 log likelihood ratio test) is a form of chi-square test for goodness of fit. The Pseudo R^2 refers to McFadden's R^2. The interpretation of McFadden's R^2 is that a value closer to 1 indicates that the final model is a good approximation of the results that would be fitted by the saturated model.

[d]*, **, and *** denote that the coefficient is statistically different from zero at the 0.10, 0.05, and 0.01 levels, respectively.

Third, the difference in local GAAP significantly explains the cross-sectional variation in cross-listing choice. Previous studies on cross-listing choices tend to put more emphasis on geographic and economic factors in the host and home countries (Sarkissian and Schill 2004; Piotroski and Srinivasan 2008). However, differences in accounting standards should not be ignored because it is associated with the economic costs of cross-listing firms to comply with the disclosure requirements of the host-country markets. This issue is dealt with further in Section 6.6.1.

In terms of explanatory power, the log likelihood statistic of -1,434.42 is significant at the 1 percent level of significance with the Mcfadden pseudo R^2 of 0.208. The statistics provide strong evidence to reject the joint null hypothesis of the probit regression that all coefficients except the intercept are zero.[157] Although this regression does not provide direct evidence on earnings quality, a reasonable explanatory power of the model is important in capturing variation in cross-sectional incentives for choosing between the U.S. and U.K. markets as cross-listing destinations.

[157] The log likelihood statistic tests the overall significance of the model and is analogous to the F-statistic in OLS regressions.

Table 6.15

Earnings Quality of U.S. and U.K. Cross-listing Firm (H_3: Stage Two of the Heckman Procedure)[a]

Variables[b] (z-statistic)	Predicted sign	*TA*	*DA*	*ABSDA*	*PEROA*	*PERTA*	*SLA*[c]
Intercept		-0.020***	0.013	0.121***	0.142	1.001***	0.042**
		(-3.03)	(1.20)	(16.13)	(0.96)	(6.18)	(2.27)
US_UK	+	0.016**	-0.012	0.034***	0.192	0.855***	0.014
		(2.21)	(-0.98)	(4.11)	(1.18)	(4.81)	(0.68)
SIZE		-0.005***	-0.004***	-0.004***	-0.142***	-0.053**	0.001
		(-5.79)	(-2.88)	(-4.09)	(-6.86)	(-2.35)	(0.55)
GROWTH		0.001	-0.002	0.025***	0.331***	0.412***	-0.006
		(0.23)	(-0.42)	(6.16)	(4.11)	(4.69)	(-0.64)
SSTK		0.000***	0.000	0.000*	0.001***	0.003***	-0.000*
		(3.34)	(0.86)	(1.88)	(2.64)	(9.72)	(-1.70)
LEV		-0.024***	-0.053***	-0.007	-0.917***	-0.989***	0.014
		(-3.17)	(-4.24)	(-0.77)	(-5.33)	(-5.26)	(0.64)
ROA		0.355***	0.238***	-0.137***	1.030***	2.409***	0.036
		(35.19)	(14.16)	(-11.71)	(4.47)	(9.55)	(1.25)
MILLS		-.008	0.001	-0.002	-0.240**	0.014	0.001
		(-1.54)	(0.10)	(-0.27)	(-2.12)	(0.11)	(0.06)
No. observations		2,787	2,787	2,787	2,787	2,787	2,787
Adjusted/Pseudo R^2		0.347	0.092	0.164	0.052	0.109	0.006

Table 6.15 (*continued*)

[a]This table reports the results from the second stage of the Heckman's procedure. The second stage of the Heckman procedure is a regression analysis of earnings quality of firms cross-listed in the U.S. and the U.K.:

$$EM_{i,t} = \tau_0 + \tau_1 US\_UK_{i,t} + \tau_2 MILLS + \sum_{k=3}^{n} \tau_k Controls_k + v_{i,t} \qquad (4.11)$$

where the earnings management metrics (EM) include total accruals (TA), discretionary accruals (DA), the absolute value of discretionary accruals (ABSDA), percent operating accruals (PEROA), and percent total accruals (PERTA). Control variables (Controls) include firm size (SIZE), growth (GROWTH), equity issuance (SSTK), financial leverage (LEV), and return on assets (ROA). The estimation is based on a pooled sample of firms cross-listed in the U.S. (322 unique firms with 1865 observations) and firms cross-listed in the U.K. (168 unique firms with 922 observations).

[b]Total accruals (*TA*) are defined as net income before extraordinary items (Compustat item 18) less cash flows from operations (Compustat item 308) scaled by total assets (Compustat item 6). Discretionary accruals (*DA*) are computed as the difference between total accruals and normal accruals, where normal accruals are estimated using the modified Jones model. The absolute value of discretionary accruals (*ABSDA*) is obtained by taking the absolute value of DA. Percent operating accruals are defined as net income (Compustat item 172) less cash from operations (Compustat item 308), divided by the absolute value of net income. Percent total accruals (*PERTA*) are defined as net income (Compustat item 172) less net cash flow to/from equityholders (purchase of common and preferred stock (Compustat item 115) + cash dividends (Compustat item 127) – sales of common and preferred stock (item 108)) less increase in cash balance (Compustat item 274) , divided by the absolute value of net income. Small loss avoidance (*SLA*) is an indicator variable set to 1 if net income scaled by total assets is between 0 and 0.01, and 0 otherwise. The cross-listing destination (*US_UK*) is an indicator variable that equals to 1 if a firm is cross-listed on the U.K. markets and 0 if a firm is cross-listed on the U.S. markets. The inverse Mills' ratio (*MILLS*) is derived from the first stage of the Heckman's procedure. For control variables, firm size (*SIZE*) is measured by the natural log of total assets, growth (*GROWTH*) is defined as percentage change in sales (Compustat item 12), equity issuance (*SSTK*) is the sales of common and preferred stock (Compustat item 108), financial leverage (*LEV*) is defined as total liabilities (Compustat item 181) divided by total assets, and return on assets (*ROA*) is defined as earnings before interest and taxes (Compustat item 178) divided by total assets. All variables, other than the indicator variable IPO, are winsorised at the 5th and 95th percentiles.

[c]Small loss avoidance (*SLA*) is a dependent dummy variable and hence the results reported in the table are based on the logistic algorithm. Pseudo R^2 is constructed using Nagelkerke R^2 because logistic regression does not have a R^2 that is equivalent to those found in OLS regressions.

[d]*, **, and *** denote that the coefficient is statistically different from zero at the 0.10, 0.05, and 0.01 levels, respectively.

Table 6.15 presents the results from the second stage of the Heckman procedure. The second stage of the Heckman procedure is a regression analysis of earnings quality of firms cross-listed in the U.S. and the U.K. (Equation 4.11). Everything else being equal, I expect τ_1 to be significantly positive because a cross-listing in the U.S. is expected to have stronger bonding effects.

As shown in Table 6.15, the coefficient τ_1 is significantly positive for unsigned discretionary accruals (0.034) at the 1 percent level of significance. This suggests that firms cross-listed in the U.K. have a higher overall propensity to manage earnings than firms cross-listed in the U.S. The regression also returns a significantly positive τ_1 coefficient when total accruals (0.016) and percent total accruals (0.855) are used as the measure of earnings quality.

However, there is no evidence showing that cross-listing firms in the U.K. use more income-increasing discretionary accruals (-0.012). This is consistent with the issues raised in univariate tests that the difference in signed discretionary accruals between the U.S. and U.K. samples may be due to the correlation between discretionary accruals and performance. In the regression model using signed discretionary accruals, the coefficient τ_1 (-0.012) loses its significance after controlling for return on assets (0.238). When small loss avoidance is used as the proxy for earnings quality, the coefficient τ_1 (0.014) is also not significant. In other words, firms cross-listed in the U.K. are not more likely to avoid small losses than firms cross-listed in the U.S. This corresponds with the insignificant regression result for signed discretionary accruals, suggesting that benchmark beaters do not appear to use discretionary accruals to boost earnings or to avoid losses.

Correcting for self-selection bias does not appear to be necessary in most cases since the inverse Mills' ratio (*MILLS*) is not statistically significant for five out of the six regressions shown in Panel A. However, Lennox et al. (2012) argue that dropping the inverse Mills' ratio is not preferable when selection bias is a significant concern, because the OLS regressions in the second stage may yield incorrect inferences in the absence of the inverse Mills' ratio.

Table 6.16 reports the results from the second stage of the Heckman procedure using time-series properties of earnings as the dependent variable. In general, the results show that firms cross-listed in the U.S. and the U.K. markets do not distinguish between these earnings attributes, as the coefficient τ_1 does not indicate significant difference from zero.[158] Since these measures provide no new findings to the multivariate analysis, they are not discussed further for testing Hypothesis 3.

[158] A further analysis shows that τ_1 loses its significance mainly because firm size and return on assets are included as control variables. This corresponds with the issue that some earnings attributes are innate that arise from a firm's fundamental business model rather than from intentional earnings manipulation that reduces earnings quality.

Table 6.16

Time-series Properties of Earnings for U.S. and U.K. Cross-listing Firm (H_3: Stage Two of the Heckman Procedure)[a]

Variables (z-statistic)[b]	Predicted sign	*PERSISTENCE*	*PREDICT1*	*PREDICT2*	*SMOOTHNESS*
Intercept		-0.238**	0.134***	-0.026	2.087***
		(-2.33)	(4.52)	(-0.052)	(8.07)
US_UK	+/-	0.086	-0.055	-0.003	0.095
		(0.72)	(-1.60)	(-0.05)	(0.31)
SIZE		0.044***	-0.019***	0.007	-0.107***
		(3.41)	(-5.05)	(1.16)	(-3.31)
GROWTH		0.104***	0.010	-0.008	-0.011
		(3.31)	(1.05)	(-0.54)	(-0.14)
SSTK		0.000	0.000	0.000	-0.000
		(0.78)	(0.39)	(0.63)	(-0.12)
LEV		0.311***	0.253***	0.072	0.261
		(3.14)	(8.83)	(1.48)	(1.04)
ROA		-0.985***	-0.670***	0.033	-0.769**
		(-7.97)	(18.76)	(0.55)	(-2.46)
MILLS		-0.036	0.202	0.008	-0.043
		(-0.46)	(0.91)	(0.20)	(-0.22)
No. observations		675	675	675	675
Adjusted/Pseudo R^2		0.216	0.648	0.002	0.057

Table 6.16 (*continued*)

[a]This table reports the results from the second stage of the Heckman's procedure using time-series properties of earnings as the dependent variable. The second stage of the Heckman procedure is a regression analysis of earnings quality of firms cross-listed in the U.S. and the U.K.:

$$EM_{i,t} = \tau_0 + \tau_1 US\_UK_{i,t} + \tau_2 MILLS + \sum_{k=3}^{n} \tau_k Controls_k + v_{i,t} \qquad (4.11)$$

The estimation is based on a smaller sample of firms because time-series data are required to compute the *EM* measures. In particular, this sample consists of 94 firms cross-listed in the U.S. (473 firm-year observations) and 37 firms cross-listed in the U.K. (202 firm-year observations).

[b] Earnings persistence (*PERSISTENCE*) is measured by the slope coefficient that measures the strength of the linear association between current earnings (Compustat item 18) and earnings in the period immediately before the earnings period. The first measure of earnings predictability (*PREDICT1*) is the square root of error variance in the equation used to estimate persistence, and the second measure of earnings predictability (*PREDICT2*) is the adjusted R^2 obtained from the same equation. Earnings smoothness (*SMOOTHNESS*) is defined as the standard deviation of net income before extraordinary items (Compustat item 18) divided by the standard deviation of cash flows from operations (Compustat item 308), both of which are scaled by beginning total assets. All other measures of earnings quality are as defined before. The cross-listing destination (*US_UK*) is an indicator variable that equals to 1 if a firm is cross-listed on the U.K. markets and 0 if a firm is cross-listed on the U.S. markets. The inverse Mills' ratio (*MILLS*) is derived from the first stage of the Heckman's procedure. For control variables, firm size (*SIZE*) is measured by the natural log of total assets, growth (*GROWTH*) is defined as percentage change in sales (Compustat item 12), equity issuance (*SSTK*) is the sales of common and preferred stock (Compustat item 108), financial leverage (*LEV*) is defined as total liabilities (Compustat item 181) divided by total assets, and return on assets (*ROA*) is defined as earnings before interest and taxes (Compustat item 178) divided by total assets. All variables, other than the indicator variable IPO, are winsorised at the 5th and 95th percentiles.

[c]*, **, and *** denote that the coefficient is statistically different from zero at the 0.10, 0.05, and 0.01 levels, respectively.

In summary, the findings provide some support to H3 that earnings quality is higher for firms cross-listed on the U.S. markets than firms that cross-listed on the U.K. markets. The strongest results are found for unsigned discretionary accruals. Firms cross-listed in the U.S. and U.K. markets differ significantly in their general propensity to manage earnings, although the evidence is not pertaining to income-increasing discretionary accruals.

6.5 Hypothesis 4

6.5.1 Univariate Analyses

Hypothesis 4 assesses the impact of home-country institutions on cross-listing firms' earnings quality. In previous research, countries with stronger investor protection regimes are found to have greater financial transparency, and firms domiciled in these countries are less likely to manage earnings (e.g. Ball et al. 2000; Leuz et al. 2003). From an accounting perspective, legal origin provides a useful starting point to identify countries whose accounting standards predominantly originate in markets versus those whose accounting standards originate in governments (Ball, Robin, and Wu 2003). At a more general level, an effective legal regime per se can deter earnings management behaviours as there are greater consequences for managers and auditors in terms of civil and criminal liability (Francis and Wang 2008).

For testing Hypothesis 4, institutions are measured in five dimensions: (1) legal origin, (2) legal tradition, (3) outside investor rights, (4) legal enforcement, and (5) ownership concentration. These five measures of institutional factors are based on La Porta et al. (1998), and country coverage of the sample is subject to data availability.[159]

[159] La Porta et al.'s (1998) study excludes one of the most important developing countries in the

The initial U.S. cross-listing sample consists of 327 unique firms with 3,645 firm-year observations. I first exclude 232 firm-year observations for which institutional data are not available. Then, the required variables are constructed and 306 firm-year observations are lost due to the use of lagged data. The final U.S. cross-listing sample consists of 306 unique firms with 3,107 firm-year observations.

The initial U.K. cross-listing sample consists of 176 unique firms with 1,184 firm-year observations. I first exclude 94 firm-year observations for which institutional data are not available. The sample remaining is used as the basis to compute earnings quality and control variables, resulting in a loss of 168 observations in constructing lagged variables. This leaves the final U.K. cross-listing sample with 168 unique firms and 922 firm-year observations.

Table 6.17 summarises the institutional characteristics of the cross-listing firms' home countries.[160] The U.S. sample contains 8 common-law countries (25.8%) and 23 code-law countries (74.2%) whereas the U.K. sample contains 12 common-law countries (52.2%) and 11 code-law countries (47.8%).[161]

world, China. Given that China has distinctive institutional characteristics (i.e. relatively poor legal and financial systems but rapidly growing economy) and is significantly represented in my cross-listing samples, I use the institutional data of China provided by Allen, Qian, and Qian (2005) to complement La Porta et al.'s (1998) data set. Allen et al. (2005) use the methods described in La Porta et al. (1998) to construct China's law and institutional indices, which ensures methodological consistency.

[160] As discussed in Chapter 5.4.3, my cross-listing sample consists of a significant proportion of countries categorised as tax-haven jurisdictions. I use ISO Country Code of Headquarters instead of ISO Country Code of Incorporation to identify the primary country of operation.

[161] The U.S. cross-listing sample (Panel A) and the U.K. cross-listing sample consist of 31 and 23 different home countries, respectively.

Table 6.17

Institutional Characteristics of Cross-listing Firms' Home Countries[a]

Countries	No. of observations	Legal origin	Legal tradition	Outside investor rights	Legal enforcement	Ownership concentration
Panel A: The U.S. cross-listing sample						
Argentina	54	French	Code law	4	5.8	0.55
Australia	124	English	Common law	2	9.4	0.51
Belgium	14	French	Code law	0	9.4	0.62
Brazil	100	French	Code law	3	6.1	0.63
Switzerland	178	German	Code law	2	10.0	0.48
Chile	47	French	Code law	5	6.5	0.38
China	445	German	Code law	3	3.5	0.29
Colombia	4	French	Code law	3	4.8	0.68
Germany	106	German	Code law	1	9.1	0.50
Denmark	21	Scandinavian	Code law	2	10.0	0.40
Spain	21	French	Code law	4	7.1	0.50
Finland	51	Scandinavian	Code law	3	10.0	0.34
France	173	French	Code law	3	8.7	0.24
United Kingdom	347	English	Common law	5	9.2	0.15
Greece	12	French	Code law	2	6.8	0.68
Hong Kong	60	English	Common law	5	8.9	0.54
India	59	English	Common law	5	5.6	0.43
Ireland	143	English	Common law	4	8.4	0.36

Table 6.17 (*continued*)

Countries	No. of observations	Legal origin	Legal tradition	Outside investor rights	Legal enforcement	Ownership concentration
Israel	52	English	Common law	3	7.72	0.55
Italy	87	French	Code law	1	7.1	0.60
Japan	233	German	Code law	4	9.2	0.13
South Korea	29	German	Code law	2	5.6	0.20
Mexico	139	French	Code law	1	5.37	0.67
Netherlands	241	French	Code law	2	10.0	0.31
Norway	44	Scandinavian	Code law	4	10.0	0.31
Peru	14	French	Code law	3	4.65	0.57
Philippines	10	French	Code law	3	3.5	0.51
Singapore	36	English	Common law	4	8.9	0.53
Sweden	62	Scandinavian	Code law	3	10.0	0.28
Taiwan	74	German	Code law	3	7.4	0.14
South Africa	127	English	Common law	5	6.4	0.52
Panel B: The U.K. cross-listing sample						
Australia	95	English	Common law	2	9.40	0.51
Belgium	6	French	Code law	0	9.40	0.62
Brazil	18	French	Code law	3	6.13	0.63
Canada	6	English	Common law	5	9.8	0.24
Switzerland	49	German	Code law	2	10.00	0.48
China	28	German	Code law	3	3.5	0.29

Table 6.17 (*continued*)

Countries	No. of observations	Legal origin	Legal tradition	Outside investor rights	Legal enforcement	Ownership concentration
Germany	11	German	Code law	1	9.05	0.50
Denmark	3	Scandinavian	Code law	2	10	0.40
Spain	18	French	Code law	4	7.1	0.50
Finland	11	Scandinavian	Code law	3	10.0	0.34
Greece	7	French	Code law	2	6.8	0.68
Hong Kong	36	English	Common law	5	8.9	0.54
India	10	English	Common law	5	5.6	0.43
Ireland	224	English	Common law	4	8.4	0.36
Israel	78	English	Common law	3	7.72	0.55
Italy	5	French	Code law	1	7.1	0.60
Malaysia	5	English	Common law	4	7.7	0.52
Netherlands	13	French	Code law	2	10.0	0.31
New Zealand	6	English	Common law	4	10	0.52
Singapore	27	English	Common law	4	8.9	0.53
Sweden	9	Scandinavian	Code law	3	10.0	0.28
United States	5	English	Common law	5	9.5	0.12
South Africa	10	English	Common law	5	6.4	0.52

[a]This table reports the composition of the U.S. and U.K. cross-listing sample by their home country. The U.S. sample comprises 306 unique cross-listing firms (3,107 firm-year observations) and the U.K. sample comprises 168 unique cross-listing firms (922 firm-year observations). The five measures of institutional factors (i.e. legal origin, legal tradition, outside investor rights, legal enforcement, and ownership concentration) are all based on La Porta et al. (1998). In particular, outside investor rights are measured as the anti-director rights index. Legal enforcement is measured as the mean score of La Porta et al.'s (1998) three enforcement variables: (1) efficiency of judicial system, (2) rule of law, and (3) corruption. Ownership concentration is measured as the average (median) percentage of common shares owned by the three largest shareholders in the ten largest non-financial, privately owned domestic firms in a given country.

Consistent with prior literature, the measures of outside investor rights and legal enforcement appear to be closely related to legal origin and legal tradition. For both the U.S. and the U.K. samples, the top three countries with the lowest outside investor rights are code-law countries (German/French). Similar results are observed for the legal enforcement variable with India being an exception. In terms of ownership concentration, Greece, Colombia, and Mexico are the top three countries with the most concentrated ownership (above 0.65%), whereas the U.S., Japan, and Taiwan have the most dispersed ownership (below 0.15%).

Table 6.18 provides descriptive statistics for the measures of earnings quality, including the five accrual variables and time-series properties of earnings. For the U.S. sample (Panel A), the measures of accruals show a stark difference across cross-listing firms' home countries. The mean value of unsigned discretionary accruals (*ABSDA*) is the highest for the Philippines (0.120), China (0.116), and South Korea (0.109), all of which are code-law countries with relatively low legal enforcement and relatively high ownership concentration. In particular, the Philippines has a mean value of unsigned discretionary accruals that are 1.5 times higher than the overall mean value across all countries (0.080).[162]

[162] Given that the standard deviation of unsigned discretionary accruals across all countries is 0.019 only, the mean value of 0.120 in the Philippines is very high.

Table 6.18

Earnings Quality of Cross-listing Firms classified by Home Country[a]

	Cross-sectional measures of earnings quality[b]					Time-series properties of earnings[c]			
Countries	*TA*	*DA*	*ABSDA*	*PEROA*	*PERTA*	*PERSISTENCE*	*PREDICT1*	*PREDICT2*	*SMOOTHNESS*
Panel A: The U.S. cross-listing sample									
Argentina	-0.048	-0.025	0.090	-1.252	0.631	0.125	0.062	0.090	2.892
Australia	-0.074	-0.024	0.079	-1.104	0.315	0.296	0.143	0.161	0.686
Belgium	-0.069	-0.064	0.064	-2.491	0.759	0.867	0.005	0.853	1.412
Brazil	-0.029	-0.014	0.089	-0.764	0.550	0.263	0.020	0.025	0.566
Switzerland	-0.039	-0.023	0.069	-1.022	0.513	0.584	0.019	0.419	0.783
Chile	-0.047	-0.024	0.067	-0.819	0.187	0.449	0.023	0.250	1.205
China	-0.059	-0.038	0.116	-0.855	0.676	0.210	0.041	0.083	0.859
Colombia	-0.083	0.006	0.049	-0.627	-0.009	n/a	n/a	n/a	n/a
Germany	-0.060	-0.041	0.072	-1.511	0.407	0.369	0.028	0.066	0.810
Denmark	-0.048	-0.038	0.082	-0.388	0.468	0.790	0.015	0.380	0.571
Spain	-0.073	-0.020	0.057	-1.405	0.661	0.208	0.015	-0.079	0.674
Finland	-0.040	-0.027	0.074	-1.577	-0.250	0.312	0.041	0.073	0.863
France	-0.054	-0.035	0.071	-1.324	0.113	0.301	0.098	-0.002	1.465
United Kingdom	-0.046	-0.019	0.078	-0.951	0.313	0.267	0.156	0.024	1.457
Greece	-0.031	-0.018	0.073	-1.598	1.119	n/a	n/a	n/a	n/a
Hong Kong	-0.049	-0.019	0.078	-0.975	0.639	-0.065	0.027	-0.150	2.428
India	-0.052	0.003	0.108	-1.034	0.903	0.406	0.053	0.106	0.999
Ireland	-0.058	-0.052	0.105	-0.768	0.514	0.241	0.147	-0.033	2.622

Table 6.18 (*continued*)

	Cross-sectional measures of earnings quality[b]					Time-series properties of earnings[c]			
Countries	*TA*	*DA*	*ABSDA*	*PEROA*	*PERTA*	*PERSISTENCE*	*PREDICT1*	*PREDICT2*	*SMOOTHNESS*
Israel	-0.042	-0.026	0.081	-1.499	0.104	0.270	0.028	0.043	1.744
Italy	-0.042	-0.021	0.053	-1.207	0.257	0.560	0.046	0.218	1.127
Japan	-0.051	-0.015	0.060	-1.895	0.371	-0.016	0.060	0.008	1.228
South Korea	-0.105	-0.057	0.109	-1.630	0.592	0.641	0.034	0.212	0.877
Mexico	-0.027	-0.008	0.071	-0.778	0.708	0.190	0.042	-0.006	1.054
Netherlands	-0.055	-0.024	0.071	-1.408	0.258	0.310	0.049	0.072	1.121
Norway	-0.094	-0.031	0.080	-1.858	0.578	0.560	0.026	0.055	0.933
Peru	0.015	0.035	0.104	-0.091	0.373	0.111	0.068	-0.170	1.088
Philippines	-0.180	-0.041	0.120	-1.510	-0.025	n/a	n/a	n/a	n/a
Singapore	-0.049	-0.016	0.101	-1.579	-0.438	0.400	0.052	0.068	0.656
Sweden	-0.047	-0.014	0.054	-1.702	0.015	n/a	n/a	n/a	n/a
Taiwan	-0.108	-0.043	0.081	-2.097	0.369	0.000	0.045	-0.182	0.846
South Africa	-0.052	-0.004	0.082	-1.238	0.549	0.211	0.074	0.040	1.455
Mean	-0.058	-0.024	0.080	-1.257	0.394	0.328	0.052	0.097	1.201
Median	-0.051	-0.024	0.078	-1.252	0.407	0.296	0.042	0.066	1.054
STD	0.033	0.019	0.019	0.509	0.331	0.228	0.040	0.207	0.605
Min	-0.180	-0.064	0.049	-2.491	-0.438	-0.065	0.005	-0.182	0.566
Max	0.015	0.035	0.120	-0.091	1.119	0.867	0.156	0.853	2.892
No. of observations	3,107	3,107	3,107	3,107	3,107	473	473	473	473

Table 6.18 (*continued*)

	Cross-sectional measures of earnings quality[b]					Time-series properties of earnings[c]			
Countries	*TA*	*DA*	*ABSDA*	*PEROA*	*PERTA*	*PERSISTENCE*	*PREDICT1*	*PREDICT2*	*SMOOTHNESS*
Panel B: The U.K. cross-listing sample									
Australia	-0.068	-0.025	0.213	-0.212	2.066	0.196	0.097	-0.037	2.346
Belgium	-0.005	0.001	0.080	-1.521	2.888	n/a	n/a	n/a	n/a
Brazil	-0.041	-0.072	0.157	-1.745	0.737	0.201	0.065	-0.002	2.100
Canada	-0.182	-0.153	0.181	-5.002	1.938	n/a	n/a	n/a	n/a
Switzerland	-0.058	-0.088	0.133	-1.269	0.835	0.389	0.027	0.130	1.206
China	0.039	-0.074	0.196	0.524	0.840	n/a	n/a	n/a	n/a
Germany	0.020	-0.001	0.089	0.232	1.512	0.905	0.013	0.463	0.456
Denmark	0.019	0.048	0.048	1.045	5.218	n/a	n/a	n/a	n/a
Spain	-0.063	-0.095	0.134	-3.521	0.897	0.524	0.023	0.185	0.980
Finland	-0.034	-0.047	0.253	-0.014	2.322	n/a	n/a	n/a	n/a
Greece	-0.091	-0.058	0.091	-3.515	2.851	n/a	n/a	n/a	n/a
Hong Kong	-0.076	-0.124	0.190	-0.154	0.964	1.685	1.332	0.179	1.528
India	-0.083	-0.052	0.106	-0.466	2.774	n/a	n/a	n/a	n/a
Ireland	-0.077	-0.067	0.152	-1.234	1.011	0.108	0.077	0.022	1.589
Israel	-0.027	-0.001	0.133	-0.520	0.638	0.174	0.146	0.138	2.530
Italy	-0.090	-0.107	0.107	-0.275	-0.066	n/a	n/a	n/a	n/a
Malaysia	-0.013	0.051	0.098	-0.694	1.619	n/a	n/a	n/a	n/a
Netherlands	-0.070	-0.007	0.202	-0.889	0.712	n/a	n/a	n/a	n/a

Table 6.18 (*continued*)

	Cross-sectional measures of earnings quality[b]					Time-series properties of earnings[c]			
Countries	*TA*	*DA*	*ABSDA*	*PEROA*	*PERTA*	*PERSISTENCE*	*PREDICT1*	*PREDICT2*	*SMOOTHNESS*
New Zealand	-0.086	-0.076	0.131	-2.246	1.177	n/a	n/a	n/a	n/a
Singapore	-0.072	-0.081	0.129	-1.244	0.549	0.562	0.037	0.110	0.995
Sweden	-0.020	-0.073	0.160	-0.126	0.150	0.180	0.723	-0.158	0.968
United States	-0.250	-0.298	0.347	-0.528	-0.583	n/a	n/a	n/a	n/a
South Africa	-0.113	-0.106	0.270	-0.653	0.486	n/a	n/a	n/a	n/a
Mean	-0.063	-0.065	0.157	-1.045	1.371	0.492	0.254	0.103	1.470
Median	-0.068	-0.072	0.134	-0.653	0.964	0.295	0.071	0.120	1.367
STD	0.064	0.072	0.069	1.411	1.250	0.486	0.434	0.166	0.677
Min	-0.250	-0.298	0.048	-5.002	-0.583	0.108	0.013	-0.158	0.456
Max	0.039	0.051	0.347	1.045	5.218	1.685	1.332	0.463	2.530
No. of observations	680	680	680	680	680	202	202	202	202

[a]This table reports earnings quality of firms cross-listed in the U.S. (Panel A) and U.K. (Panel B) classified by their home country. For cross-sectional measures of earnings quality, the U.S. sample comprises 306 unique cross-listing firms (3,107 firm-year observations) and the U.K. sample comprises 168 unique cross-listing firms (922 firm-year observations). Time-series properties of earnings are based on a smaller sample size of 94 firms cross-listed in the U.S. (473 firm-year observations) and 37 firms cross-listed in the U.K. (202 firm-year observations).

[b]Total accruals (*TA*) are defined as net income before extraordinary items (Compustat item 18) less cash flows from operations (Compustat item 308) scaled by total assets (Compustat item 6). Discretionary accruals (*DA*) are computed as the difference between total accruals and normal accruals, where normal accruals are estimated using the modified Jones model. The absolute value of discretionary accruals (*ABSDA*) is obtained by taking the absolute value of DA. Percent operating accruals are defined as net income (Compustat item 172) less cash from operations (Compustat item 308), divided by the absolute value of net income. Percent total accruals (*PERTA*) are defined as net income (Compustat item 172) less net cash flow to/from equityholders (purchase of common and preferred stock (Compustat item 115) + cash dividends (Compustat item 127) – sales of common and preferred stock (item 108)) less increase in cash balance (Compustat item 274) , divided by the absolute value of net income.

[c]Earnings persistence (*PERSISTENCE*) is measured by the slope coefficient that measures the strength of the linear association between current earnings (Compustat item 18) and earnings in the period immediately before the earnings period. The first measure of earnings predictability (*PREDICT1*) is the square root of error variance in the equation used to estimate persistence, and the second measure of earnings predictability (*PREDICT2*) is the adjusted R^2 obtained from the same equation. Earnings smoothness (*SMOOTHNESS*) is defined as the standard deviation of net income before extraordinary items (Compustat item 18) divided by the standard deviation of cash flows from operations (Compustat item 308), both of which are scaled by beginning total assets.

The statistics for signed discretionary accruals reveal that cross-listing firms domiciled in Latin America and Asia tend to have more extreme accruals (positive and negative) while cross-listing firms domiciled in Europe appear to have less accrual-based earnings management or better earnings quality.

Compared with the U.S. sample, the accrual variables in the U.K. sample (Panel B) generally have larger values of standard deviation, indicating that the distributions of accruals are more spread out. Malaysia (0.051), Denmark (0.048), and Belgium (0.001) are the three countries that have the highest value of signed discretionary accruals. The U.S. (0.347), South Africa (0.27), and Finland (0.253) are the three countries that have the highest value of unsigned discretionary accruals.[163] These countries have a mixture of legal origins and the level of investor protection, suggesting that the home-country impacts on firms cross-listed in the U.K. may not be as strong as those on firms cross-listed in the U.S.

Table 6.18 also reports time-series properties of earnings based on 27 countries in the U.S. sample and 10 countries in the U.K. sample. In general, earnings are more persistent and predictable for firms domiciled in European countries than for firms domiciled in Latin American and Asian countries. Evidence of earnings smoothing is

[163] Recalling that Chapter 5 of the thesis does not report any U.S. firms are cross-listed on the U.K. markets. The U.S. firms included in the U.K. cross-listing sample are firms incorporated in the tax-haven countries but headquartered in the U.S. Only 5 firm-year observations are included in the U.K. sample, which is unlikely to have significant statistical impacts on the multivariate analyses.

mixed as some European countries (e.g. Spain, Germany, and Switzerland) have more smoothing of the earnings stream relative to cash flows.

Table 6.19 presents Pearson (above the diagonal) and Spearman (below the diagonal) correlations among the institutional factors used for testing Hypothesis 4.[164] For both the U.S. (Panel A) and the U.K. samples (Panel B), legal tradition (1 = common-law countries) is positively related to outside investor rights and legal enforcement at the 1 percent level of significance for both the Pearson and Spearman correlations. Outside investor rights have negative associations with ownership concentration, which is consistent with Leuz et al.'s (2003) argument that dispersed ownership structure and large equity market complement each other and may be the joint outcome of stronger investor protection.

It is also important to note that some of the correlations are high in magnitude, indicating to a certain extent that one institutional variable can be linearly predicted from another.[165] To address the multicollinearity issue and to produce more accurate coefficient estimates, the institutional variables are introduced one by one in the multivariate analyses.

[164] Correlations among earnings quality measures and control variable are not reported in Table 6.19 because these correlations are addressed in Hypothesis 1, 2, and 3. In particular, the correlations among the accrual variables in Hypothesis 4 are similar to those in Hypothesis 2 (Table 6.8).

[165] The correlation between legal tradition and outside investor rights is particularly high (Pearson correlation = 0.596; Spearman correlation = 0.585), suggesting that multicollinearity is a significant concern in the subsequent regression analyses.

Table 6.19

Correlation Matrix among Home-country Institutional Characteristics[a]

Variables[b]	*Legal tradition*	*Outside investor rights*	*Legal enforcement*	*Ownership concentration*
Panel A: The U.S. cross-listing sample				
Legal tradition		0.596***	0.210***	-0.020
Outside investor rights	0.585***		0.025	-0.468***
Legal enforcement	0.096***	-0.084***		-0.189***
Ownership concentration	0.042**	-0.415***	-0.189***	
Panel B: The U.K. cross-listing sample				
Legal tradition		0.487***	0.151***	-0.033
Outside investor rights	0.483***		-0.231***	-0.357***
Legal enforcement	-0.095**	-0.342***		0.052
Ownership concentration	0.106***	-0.249***	-0.134***	

[a]This table presents the correlation matrix among the institutional factors used for testing Hypothesis 4. The upper triangle of the table (above the diagonal) shows Pearson correlation coefficients and the lower triangle (below the diagonal) shows Spearman correlation coefficients. The U.S. sample comprises 306 unique cross-listing firms (3,107 firm-year observations) and the U.K. sample comprises 168 unique cross-listing firms (922 firm-year observations).

[b] The institutional factors are based on La Porta et al. (1998). In particular, legal tradition is coded as a dummy variable that takes the value of 1 for common-law countries and 0 otherwise. Outside investor rights are measured as the anti-director rights index. Legal enforcement is measured as the mean score of La Porta et al.'s (1998) three enforcement variables: (1) efficiency of judicial system, (2) rule of law, and (3) corruption. Ownership concentration is measured as the average (median) percentage of common shares owned by the three largest shareholders in the ten largest non-financial, privately owned domestic firms in a given country.

[c]*, **, and *** denote significant correlations at the 0.10, 0.05, and 0.01 levels, respectively.

6.5.2 Multivariate Analyses

In general, the descriptive statistics show that the firms domiciled in code-law countries are more likely to have extreme signed and unsigned discretionary accruals than those domiciled in common-law countries when the cross-listing destination is the U.S. The U.K. sample does not show similar patterns as a mixture of common-law and code-law countries is found to have extreme accruals and low quality of earnings. In this section, the impact of institutional characteristics (*INSTITUTIONS*) is examined in regression analyses, taking into account its interaction with the cross-listing status (*CL*). The results reported in Table 6.20 through Table 6.23 below (Equation 4.12) use legal tradition, outside investor rights, legal enforcement, and ownership concentration respectively as the measures of institutions.[166]

Table 6.20 presents the results from regressing earnings quality measures on legal tradition (common law = 1). For the U.S. sample (Panel A), the decision to cross-list appears to attenuate income-increasing earnings manipulations as the coefficient φ_1 is significantly negative for total accruals (-0.007) and signed discretionary accruals (-0.020). However, φ_1 on unsigned discretionary accruals is significantly positive, showing that firms in the post-listing period have a greater amount of discretionary accruals than do firms in the pre-listing period.

[166] Regression coefficients on control variables are similar to those reported before, and are hence not tabulated and discussed again.

Table 6.20

The Home-country Impact (Legal Tradition) on Earnings Quality of Cross-listing Firms (H_{4a})[a]

Variables (t-statistics)[b]	Predicted sign	*TA*	*DA*	*ABSDA*	*PEROA*	*PERTA*	*SLA*
Panel A: The U.S. cross-listing sample							
CL		-0.007*	-0.020***	0.010***	0.087	0.011	-0.040
		(-1.94)	(-4.54)	(2.90)	(1.11)	(0.18)	(-0.26)
Legal tradition	-	-0.003	0.001	-0.002	0.328***	-0.068	-0.791***
		(-0.65)	(0.24)	(-0.37)	(3.05)	(-0.81)	(-3.02)
*CL*Legal tradition*	+	0.007	0.008	0.005	-0.202	0.100	0.569*
		(1.20)	(1.09)	(0.87)	(-1.45)	(0.92)	(1.77)
Panel B: The U.K. cross-listing sample							
CL		0.020	0.022	-0.027	0.778*	0.097	-0.211
		(0.84)	(0.66)	(-0.95)	(1.90)	(0.23)	(-0.42)
Legal tradition	-	-0.052**	-0.040	-0.014	-0.244	-0.314	-0.341
		(-1.99)	(-1.14)	(-0.44)	(-0.56)	(-0.68)	(-0.59)
*CL*Legal tradition*	+	0.027	0.048	0.000	-0.189	0.509	1.012
		(0.96)	(1.26)	(0.01)	(-0.40)	(1.03)	(1.54)

[a]This table reports the results from regressing earnings quality measures on institutional factors that characterise home countries:
$EM_{i,t} = \varphi_0 + \varphi_1 CL_{i,t} + \varphi_2 INSTITUTIONS_i + \varphi_3 CL_{i,t} \times INSTITUTIONS_i + \sum_{k=4}^{n} \varphi_k Controls_k + \varepsilon_{i,t}$ (4.12).
The estimation is based on 306 unique cross-listing firms in the U.S. (3,107 firm-year observations) and 168 unique cross-listing firms in the U.K. (922 firm-year observations).

[b]The indicator of cross-listing (*CL*) is a dummy variable that equals to 1 if a firm in a particular year is cross-listed and 0 otherwise. Legal tradition (*INSTITUTIONS*) is coded as a dummy variable that takes the value of 1 for common-law countries and 0 otherwise. Other variables are as defined before.

[c]*, **, and *** denote that the coefficient is statistically different from zero at the 0.10, 0.05, and 0.01 levels, respectively.

The coefficient φ_2 is significant for small loss avoidance (-0.791) at the 1 percent level of significance. This means that firms domiciled in common-law countries are less likely to report small positive earnings than firms domiciled in code-law countries. However, the accrual variables in general (except percent operating accruals) do not appear to be influenced by home-country legal tradition.

The interaction term (*CL*$\times$ *INSTITUTIONS*) captures the joint impact of cross-listing and legal tradition on earnings quality. The coefficient φ_3 is hypothesised to be positive because Hypothesis 4b states that the improvement in earnings quality is greater for cross-listing firms from home countries with weaker investor protection and legal enforcement. The opposite signs of the φ_2 and φ_3 coefficients reflect the reducing gap in the tendency to report small positive earnings between cross-listing firms domiciled in common law countries and cross-listing firms domiciled in code law countries. For five out of the six measures of earnings quality, however, the coefficient φ_3 is not statistically significant, providing no compelling evidence of greater improvements in earnings quality from firms with weak institutions. To some extent, the results reflect the methodological issue that the traditional dichotomy of common-law and code-law countries is overly simple in capturing the underlying institutional characteristics of cross-listing firms' home countries.

For the U.K. sample (Panel B), legal tradition takes the expected negative sign for total accruals only (-0.052). It means that cross-listing firms from code-law countries are not more likely to manipulate discretionary accruals and/or to avoid small losses. Because the U.K. sample consists mostly of firms in the post-listing period (i.e. *CL* = 1), the coefficients φ_1 and φ_3 do not provide strong indications of the differential impacts of cross-listing status on earnings quality.

Table 6.21 reports the results from regressing earnings quality measures on outside investor rights, where the latter is measured as La Porta et al.'s (1998) anti-director rights metrics. Results for the U.S. sample (Panel A) reveal that the coefficient on *CL* is significant for signed and unsigned discretionary accruals (-0.020 and 0.015) whereas the coefficients on outside investor rights and the interaction term are not significant. This suggests that a firm's decisions to cross-list, rather than the institutional background of that firm, have more important implications on earnings quality. The negative coefficient on discretionary accruals means that firms domiciled in countries with stronger protection of minority shareholders have less income-increasing earnings management.

For the U.K. sample (Panel B of Table 6.21), the φ_2 coefficient on percent operating accruals is significantly negative (-0.511) at the 1 percent level of significance, indicating that firms domiciled in countries with weaker anti-director rights tend to exhibit stronger income-increasing earnings management. The results for discretionary accruals and target beating are insignificant, which means that the impact of outside investor rights on earnings quality of firms cross-listed in the U.K. is limited.

The regression results based on legal enforcement are reported in Table 6.22. For the U.S. sample (Panel A), the φ_2 coefficient on unsigned discretionary accruals is significantly negative (-0.005). Consistent with the expectation, strong legal enforcement in home countries may have reduced cross-listing firms' general propensity to manage earnings.

Recalling from Table 6.20 and Table 6.21, the decision to cross-list (i.e. the φ_1 coefficient) is significantly associated with earnings quality. When legal enforcement is included in the regression, however, the decision to cross-list alone appears to lose its significance. This is not to say that country-level legal enforcement is an effective substitute for the firm-level cross-listing choice. Rather, legal enforcement and the cross-listing decision appear to interact with each other in influencing earnings quality. For example, the φ_3 coefficient on unsigned discretionary accruals (0.003) is significantly positive at the 5 percent level of significance, indicating that the slope of legal enforcement is higher for firms in the post-listing period than for firms in the pre-listing period.

Table 6.21
The Home-country Impact (Outside Investor Rights) on Earnings Quality of Cross-listing firms (H_{4a})[a]

Variables (t-statistics)[b]	Predicted sign	*TA*	*DA*	*ABSDA*	*PEROA*	*PERTA*	*SLA*
Panel A: The U.S. cross-listing sample							
CL		-0.006	-0.020**	0.015**	0.069	-0.080	0.248
		(-0.80)	(-2.17)	(2.10)	(0.40)	(-0.60)	(0.74)
Outside investor rights	-	-0.001	0.002	0.002	-0.003	-0.036	0.020
		(-0.63)	(0.75)	(1.4)	(-0.09)	(-1.20)	(0.26)
*CL*Outside investor rights*	+	0.000	0.001	-0.001	-0.016	0.039	-0.049
		(0.22)	(0.34)	(-0.59)	(-0.32)	(1.00)	(-0.49)
Panel B: The U.K. cross-listing sample							
CL		0.064	0.049	-0.062	-0.609	0.616	0.529
		(1.44)	(0.82)	(-1.17)	(-0.81)	(0.78)	(0.43)
Outside investor right	-	-0.007	-0.020	-0.006	-0.511***	-0.050	0.149
		(-0.58)	(-1.29)	(-0.44)	(-2.66)	(-0.25)	(0.49)
*CL*Outside investor right*	+	-0.007	0.001	0.011	0.369*	-0.054	-0.039
		(-0.57)	(0.05)	(0.73)	(1.74)	(-0.24)	(-0.11)

[a]This table reports the results from regressing earnings quality measures on institutional factors that characterise home countries:
$EM_{i,t} = \varphi_0 + \varphi_1 CL_{i,t} + \varphi_2 INSTITUTIONS_i + \varphi_3 CL_{i,t} \times INSTITUTIONS_i + \sum_{k=4}^{n} \varphi_k Controls_k + \varepsilon_{i,t}$ (4.12).
The estimation is based on 306 unique cross-listing firms in the U.S. (3,107 firm-year observations) and 168 unique cross-listing firms in the U.K. (922 firm-year observations).

[b]The indicator of cross-listing (*CL*) is a dummy variable that equals to 1 if a firm in a particular year is cross-listed and 0 otherwise. Outside investor rights (*INSTITUTIONS*) are defined as La Porta et al.'s (1998) anti-director rights, an index aggregating shareholder rights. The index ranges from 0 to 6, where a higher value indicates that laws protect minority shareholders better. Other variables are as defined before.

[c]*, **, and *** denote that the coefficient is statistically different from zero at the 0.10, 0.05, and 0.01 levels, respectively.

Table 6.22

The Home-country Impact (Legal Enforcement) on Earnings Quality of Cross-listing Firms (H_{4a})[a]

Variables (t-statistics)[b]	Predicted sign	*TA*	*DA*	*ABSDA*	*PEROA*	*PERTA*	*SLA*
Panel A: The U.S. cross-listing sample							
CL		0.007	-0.015	-0.015	-0.134	0.434**	1.061
		(0.57)	(-0.96)	(-1.27)	(-0.49)	(2.01)	(1.45)
Legal enforcement	-	0.002	0.001	-0.005***	0.013	0.015	0.080
		(1.58)	(0.49)	(-3.72)	(0.45)	(0.66)	(1.06)
*CL*Legal enforcement*	+	-0.001	-0.000	0.003**	0.023	-0.051**	-0.115
		(-0.88)	(-0.14)	(2.08)	(0.69)	(-1.99)	(-1.36)
Panel B: The U.K. cross-listing sample							
CL		-0.082	-0.171	-0.090	3.498**	-0.622	-0.143
		(-0.82)	(-1.28)	(-0.77)	(2.09)	(-0.36)	(-0.06)
Legal enforcement	-	-0.018	-0.016	-0.009	0.253	0.009	-0.026
		(-1.61)	(-1.11)	(-0.66)	(1.38)	(0.05)	(-0.10)
*CL*Legal enforcement*	+	0.014	0.027*	0.008	-0.330*	0.130	0.057
		(1.26)	(1.74)	(0.55)	(-1.70)	(0.64)	(0.21)

[a]This table reports the results from regressing earnings quality measures on institutional factors that characterise home countries:
$EM_{i,t} = \varphi_0 + \varphi_1 CL_{i,t} + \varphi_2 INSTITUTIONS_i + \varphi_3 CL_{i,t} \times INSTITUTIONS_i + \sum_{k=4}^{n} \varphi_k Controls_k + \varepsilon_{i,t}$ (4.12).
The estimation is based on 306 unique cross-listing firms in the U.S. (3,107 firm-year observations) and 168 unique cross-listing firms in the U.K. (922 firm-year observations).

[b]The indicator of cross-listing (*CL*) is a dummy variable that equals to 1 if a firm in a particular year is cross-listed and 0 otherwise. Legal enforcement (*INSTITUTIONS*) is measured as the mean score of La Porta et al.'s (1998) three enforcement variables: (1) efficiency of judicial system, (2) rule of law, and (3) corruption. Other variables are as defined before.

[c]*, **, and *** denote that the coefficient is statistically different from zero at the 0.10, 0.05, and 0.01 levels, respectively.

Table 6.23

The Home-country Impact (Ownership Concentration) on Earnings Quality of Cross-listing Firms (H_{4a})[a]

Variables (t-statistics)[b]	Predicted sign	*TA*	*DA*	*ABSDA*	*PEROA*	*PERTA*	*SLA*
Panel A: The U.S. cross-listing sample							
CL		-0.023***	-0.039***	0.013**	-0.106	-0.044	-0.315
		(-3.56)	(-4.56)	(2.02)	(-0.68)	(-0.36)	(-1.01)
Ownership concentration	+	0.008	-0.004	-0.011	0.598**	0.219	-0.713
		(0.66)	(-0.23)	(-0.86)	(1.98)	(0.92)	(-1.18)
CL Ownership concentration*	-	0.049***	0.057***	-0.004	0.259	0.202	1.160
		(2.95)	(2.64)	(-0.25)	(0.67)	(0.66)	(1.48)
Panel B: The U.K. cross-listing sample							
CL		0.123*	0.084	-0.043	2.777**	0.350	2.389
		(1.86)	(0.95)	(-0.55)	(2.50)	(0.30)	(1.30)
Ownership concentration	+	0.172	0.130	-0.114	3.941*	1.096	4.010
		(1.26)	(0.71)	(-0.71)	(1.72)	(0.46)	(1.09)
CL Ownership concentration*	-	-0.183	-0.065	0.040	-4.756*	0.221	-4.625
		(-1.24)	(-0.33)	(0.23)	(-1.92)	(0.09)	(-1.16)

[a]This table reports the results from regressing earnings quality measures on institutional factors that characterise home countries:
$EM_{i,t} = \varphi_0 + \varphi_1 CL_{i,t} + \varphi_2 INSTITUTIONS_i + \varphi_3 CL_{i,t} \times INSTITUTIONS_i + \sum_{k=4}^{n} \varphi_k Controls_k + \varepsilon_{i,t}$ (4.12).
The estimation is based on 306 unique cross-listing firms in the U.S. (3,107 firm-year observations) and 168 unique cross-listing firms in the U.K. (922 firm-year observations).

[b]The indicator of cross-listing (*CL*) is a dummy variable that equals to 1 if a firm in a particular year is cross-listed and 0 otherwise. Ownership concentration (*INSTITUTIONS*) is measured as the average (median) percentage of common shares owned by the three largest shareholders in the ten largest non-financial, privately owned domestic firms in a given country. Other variables are as defined before.

[c]*, **, and *** denote that the coefficient is statistically different from zero at the 0.10, 0.05, and 0.01 levels, respectively.

For the U.K. sample (Panel B of Table 6.22), the φ_2 coefficient is not significant in explaining earnings quality. For percent operating accruals only, the interaction between cross-listing status and legal enforcement (-0.330) is significant at the 10 percent significance level, but the result appears to be mainly driven by the significant impact of the cross-listing decision.

Table 6.23 reports the regression results using ownership concentration as the measure of home-country institutions. Similar to the results provided in Table 6.20 and Table 6.21, the decision to cross-list seems to be more important than institutional factors in explaining earnings quality. In the U.S. sample (Panel A), the φ_1 coefficient is significant for total accruals (-0.023), signed discretionary accruals (-0.039), and unsigned discretionary accruals (0.013). The φ_2 coefficient is only significant for percent operating accruals (0.598). The positive direction is as hypothesised as countries characterised by high ownership concentration tend to have lower earnings quality and more evidence of earnings management. Similar results are observed in the U.K. sample (Panel B). The decision to cross-list is significantly associated with total accruals (0.123) and percent operating accruals (2.777), while ownership concentration only has marginal impacts on percent operating accruals.

For the U.S. sample, the φ_3 coefficient reported in Table 6.23 is significant for total accruals (0.049) and signed discretionary accruals (0.057) at the 1 percent level of significance. This is inconsistent with the expectation that firms domiciled in countries with high ownership concentration experience greater improvements in earnings quality after cross-listing. A possible explanation for the result is that a country-level proxy for ownership concentration may not be representative of individual firms' ownership structure. However, given the data constraint, I do not press this issue further.

In summary, the findings provide some support for H_{4a} that earnings quality is higher for cross-listing firms from home countries with stronger investor protection and legal enforcement than cross-listing firms from home countries with weaker investor protection and legal enforcement. Among the four measures of institutional characteristics (i.e. legal tradition, outside investor rights, legal enforcement, and ownership concentration), legal tradition, legal enforcement, and ownership concentration appear to exhibit some explanatory power of earnings quality for firms cross-listed in the U.S. markets. For firms cross-listed in the U.K., legal tradition, outside investor rights and ownership concentration have significant associations with some of the earnings quality measures, but the statistical significance is lower.

Using the U.S. sample, the findings also provide some support for H_{4b} that improvements in earnings quality is greater for firms domiciled in countries with relatively weak institutions. Firms domiciled in code law countries have a higher tendency to report small positive earnings than firms domiciled in common law countries, but the difference in tendency decreases after they are cross-listed on the U.S. markets. Similarly, discretionary accruals is higher for firms domiciled in countries with weak enforcement than firms domiciled in countries with strong enforcement, but the difference reduces in the post-listing period. In comparison, I do not find support for H_{4b} based on the U.K. sample (Panel B), as the φ_3 coefficient is not statistically significant in general.

6.6 Robustness Tests

6.6.1 International GAAP Differences

In testing Hypothesis 3, the Heckman procedure is used. The first stage of this procedure is a selection model used to estimate firms' decision to cross-list their stocks on the U.S. or the U.K. stock exchange markets. The results show that the difference in local GAAP (*DIFF_GAAP*) significantly explains the cross-sectional variation in cross-listing choice.

However, as mentioned in Section 4.5.3, Bae et al.'s (2008) measure of differences in accounting standards relies on a 2001 survey of national accounting rules benchmarked against IAS. This "one shot" approach raises some concerns about construct validity because my sample period spans from 1989 to 2011 and the difference in local GAAP may change as countries adopt IFRS. For example, the European Parliament and the European Council of Ministers require the adoption of IFRS by all EU listed companies from 2005 onwards. As a result, for cross-listing firms domiciled in EU countries, no reconciliation was required in SEC filings after the SEC relaxed the reporting standards in 2008. It is therefore interesting to explore the extent to which the difference in local GAAP affects the cross-listing choice.

The multivariate models for testing Hypothesis 3 (i.e. Equation 4.10 and Equation 4.11) are re-estimated after I drop *DIFF_GAAP* from Equation 4.10. The results are reported in Table 6.24 and Table 6.25.

The coefficients estimates of the first stage of the Heckman procedure (Table 6.24) are similar in magnitude and direction to those reported in Table 6.14, and the model's pseudo R^2 only decreases slightly from 0.208 to 0.205. The coefficients estimates of the second stage of the Heckman procedure (Table 6.25) are also similar to those reported in Table 6.15. In particular, the coefficient on *US_UK* is significantly positive for total accruals (0.016), unsigned discretionary accruals (0.034) and percent total accruals (0.864). These results indicate that the earnings quality differences between firms cross-listed in the U.S. and firms cross-listed in the U.K. are robust to the exclusion of "the difference in local GAAP" from the cross-listing choice model in the first stage.

Table 6.24

Determinants of Cross-listing Choice (H_3: Stage One of the Heckman Procedure without *DIFF_GAAP*)[a]

Variables[b]	Predicted sign	Coefficient	Standard error	z-statistic[c]	p-value (two-tailed)
Intercept		-6.112***	0.512	-11.93	0.000
GROWTH_OPPR	+/-	0.543***	0.072	7.58	0.000
ECO_PROX	-	-2.413***	0.166	-14.52	0.000
GEO_PROX	+	-0.001	0.001	-0.82	0.412
ECO_DEV	+	0.596***	0.048	12.47	0.000
No. Observations	2,787				
LR statistic	-1,440.53				
Pseudo R^2	0.205				

[a]This table reports the results from the first stage of the Heckman procedure after removing *DIFF_GAAP*. The first stage of the Heckman procedure is a selection model used to estimate firms' decision to cross-list their stocks in the U.S. or the U.K. stock exchange market:

$$US\_UK_{i,t} = \pi_0 + \pi_1 GROWTH\_OPPR_{i,t} + \pi_2 ECO\_PROX_{i,t} + \pi_3 GEO\_PROX_{i,t} + \pi_4 ECO\_DEV_{i,t} + + u_{i,t} \quad \text{(4.10 modified)}$$

The probit regression is based on a pooled sample of firms cross-listed in the U.S. (322 unique firms with 1865 observations) and firms cross-listed in the U.K. (168 unique firms with 922 observations).

[b]I define growth opportunity (*GROWTH_OPPR*) as 2-year geometric average of annual inflation-adjusted growth in sales, economic proximity (*ECO_PROX*) as the percentage of home country's exports going to the U.S., geographic proximity (*GEO_PROX*) as the Great Circle Distance from the capital city of the home country to the capital city of the U.S. (i.e. Washington, D.C.), and economic development (*ECO_DEV*) as the log GNP per capita in home country. The cross-listing destination (*US_UK*) is an indicator variable that equals to 1 if a firm is cross-listed on the U.K. markets and 0 if a firm is cross-listed on the U.S. markets. All variables, other than the indicator variable *US_UK*, are winsorised at the 5th and 95th percentiles.

[c]The LR statistics(i.e. -2 log likelihood ratio test) is a form of chi-square test for goodness of fit. The Pseudo R^2 refers to McFadden's R^2. The interpretation of McFadden's R^2 is that a value closer to 1 indicates that the final model is a good approximation of the results that would be fitted by the saturated model.

[d]*, **, and *** denote that the coefficient is statistically different from zero at the 0.10, 0.05, and 0.01 levels, respectively.

Table 6.25

Earnings Quality of U.S. and U.K. Cross-listing Firm (H_3: Stage Two of the Heckman Procedure based on modified Stage One Model)[a]

Variables[b] (z-statistic)	Predicted sign	*TA*	*DA*	*ABSDA*	*PEROA*	*PERTA*	*SLA*[c]
Intercept		-0.019***	0.013	0.121***	0.154	1.000***	-0.011
		(-2.92)	(1.20)	(16.16)	(1.04)	(6.19)	(-0.69)
US_UK	+	0.016**	-0.012	0.034***	0.212	0.864***	0.002
		(2.29)	(-1.02)	(4.17)	(1.29)	(4.84)	(0.13)
SIZE		-0.005***	-0.004***	-0.004***	-0.145***	-0.054**	0.005**
		(-5.87)	(-2.83)	(-4.08)	(-6.92)	(-2.34)	(2.05)
GROWTH		0.001	-0.002	0.025***	0.329***	0.411***	-0.012
		(0.21)	(-0.42)	(6.13)	(4.08)	(4.68)	(-1.46)
SSTK		0.000***	0.000	0.000*	0.001***	0.003***	-0.000*
		(3.35)	(0.86)	(1.88)	(2.64)	(9.72)	(-0.17)
LEV		-0.024***	-0.053***	-0.007	-0.919***	-0.989***	0.053***
		(-3.13)	(-4.24)	(-0.77)	(-5.34)	(-5.26)	(2.96)
ROA		0.357***	0.238***	-0.136***	1.036***	2.411***	0.010
		(35.30)	(14.15)	(-11.69)	(4.49)	(9.56)	(0.40)
MILLS		-.008	0.001	-0.002	-0.260**	0.007	0.021*
		(-1.64)	(0.14)	(-0.36)	(-2.26)	(0.05)	(1.73)
No. observations		2,787	2,787	2,787	2,787	2,787	2,787
Adjusted/Pseudo R^2		0.347	0.092	0.164	0.052	0.109	0.026

Table 6.25 (*continued*)

[a]This table reports the results from the second stage of the Heckman procedure. The second stage of the Heckman procedure is a regression analysis of earnings quality of firms cross-listed in the U.S. and the U.K.:

$$EM_{i,t} = \tau_0 + \tau_1 US\_UK_{i,t} + \tau_2 MILLS + \sum_{k=3}^{n} \tau_k Controls_k + v_{i,t} \qquad (4.11)$$

where the earnings management metrics (EM) include total accruals (TA), discretionary accruals (DA), the absolute value of discretionary accruals (ABSDA), percent operating accruals (PEROA), and percent total accruals (PERTA). Control variables (Controls) include firm size (SIZE), growth (GROWTH), equity issuance (SSTK), financial leverage (LEV), and return on assets (ROA). The estimation is based on a pooled sample of firms cross-listed in the U.S. (322 unique firms with 1865 observations) and firms cross-listed in the U.K. (168 unique firms with 922 observations).

[b]Total accruals (*TA*) are defined as net income before extraordinary items (Compustat item 18) less cash flows from operations (Compustat item 308) scaled by total assets (Compustat item 6). Discretionary accruals (*DA*) are computed as the difference between total accruals and normal accruals, where normal accruals are estimated using the modified Jones model. The absolute value of discretionary accruals (*ABSDA*) is obtained by taking the absolute value of DA. Percent operating accruals are defined as net income (Compustat item 172) less cash from operations (Compustat item 308), divided by the absolute value of net income. Percent total accruals (*PERTA*) are defined as net income (Compustat item 172) less net cash flow to/from equityholders (purchase of common and preferred stock (Compustat item 115) + cash dividends (Compustat item 127) – sales of common and preferred stock (item 108)) less increase in cash balance (Compustat item 274) , divided by the absolute value of net income. Small loss avoidance (*SLA*) is an indicator variable set to 1 if net income scaled by total assets is between 0 and 0.01, and 0 otherwise. The cross-listing destination (*US_UK*) is an indicator variable that equals to 1 if a firm is cross-listed on the U.K. markets and 0 if a firm is cross-listed on the U.S. markets. The inverse Mills' ratio (*MILLS*) is derived from the first stage of the Heckman's procedure. For control variables, firm size (*SIZE*) is measured by the natural log of total assets, growth (*GROWTH*) is defined as percentage change in sales (Compustat item 12), equity issuance (*SSTK*) is the sales of common and preferred stock (Compustat item 108), financial leverage (*LEV*) is defined as total liabilities (Compustat item 181) divided by total assets, and return on assets (*ROA*) is defined as earnings before interest and taxes (Compustat item 178) divided by total assets. All variables, other than the indicator variable IPO, are winsorised at the 5th and 95th percentiles.

[c]Small loss avoidance (*SLA*) is a dependent dummy variable and hence the results reported in the table are based on the logistic algorithm. Pseudo R^2 is constructed using Nagelkerke R^2 because logistic regression does not have a R^2 that is equivalent to those found in OLS regressions.

[d]*, **, and *** denote that the coefficient is statistically different from zero at the 0.10, 0.05, and 0.01 levels, respectively.

6.6.2 The Home Country Impact on the Improvement in Earnings Quality

Hypothesis 4b investigates improvements in earnings quality for cross-listing firms from home countries with different institutions. This is tested by looking at the joint impact of cross-listing (*CL*) and institutional factors (*INSTITUTIONS*) on earnings quality. The notion of improvement in this research design is not towards some theoretical ideal, but towards a relative level of earnings quality when firms domiciled in countries with different institutions are compared in the pre- and post-cross-listing periods.

In the robustness test, the construct of improvements in earnings quality is reassessed using changes in the EM metrics ($\Delta EM_{i,t}$), which represents the change in earnings quality measures from year *t-1* to year *t*. A negative value of $\Delta EM_{i,t}$ is likely to signify an improvement in earnings quality. As shown in Table 6.26, Equation 4.12 is re-estimated using $\Delta EM_{i,t}$ as the dependent variable and legal enforcement as the proxy for institutions (*INSTITUTIONS*).[167]

[167] In untabulated analyses, the other institutional factors (i.e. legal tradition, outside investor rights, and ownership concentration) used in the main analyses are also tested, but the results are largely insignificant.

Table 6.26

The home-country impact on the improvement in earnings quality of cross-listing firms (H_{4b} based on ΔEM)[a]

Variables (t-statistics)[b]	Predicted sign	*ΔTA*	*ΔDA*	*ΔABSDA*	*ΔPEROA*	*ΔPERTA*
Panel A: The U.S. cross-listing sample						
Intercept		0.002	-0.010	0.018	0.023	-0.032
		(0.11)	(-0.36)	(0.91)	(0.05)	(-0.08)
CL		-0.001	-0.002	-0.040*	-0.388	-0.216
		(-0.04)	(-0.06)	(-1.95)	(-0.84)	(-0.52)
Legal enforcement		0.001	0.000	-0.002	-0.007	-0.002
		(0.37)	(0.07)	(-1.03)	(-0.15)	(-0.04)
CL Legal enforcement*	+	-0.000	0.000	0.005**	0.043	0.027
		(-0.09)	(0.09)	(2.00)	(0.81)	(0.57)
SIZE		-0.000	0.000	-0.000	-0.008	-0.000
		(-0.01)	(0.06)	(-0.32)	(-0.26)	(-0.00)
GROWTH		-0.014*	0.004	0.009	0.767***	0.545***
		(-1.65)	(0.33)	(0.94)	(3.66)	(2.90)
SSTK		-0.000	-0.000	-0.000	-0.000	-0.000
		(-0.21)	(-0.00)	(-0.00)	(-0.13)	(0.04)
LEV		-0.020**	-0.000	0.005	-0.090	-0.119
		(-2.04)	(-0.01)	(0.46)	(-0.37)	(-0.54)
ROA		0.054***	0.062*	0.015	1.311**	0.454
		(2.59)	(1.92)	(0.66)	(2.49)	(0.96)
No. observations		2,791	2,791	2,791	2,791	2,791
Adjusted/Pseudo R^2		0.002	0.000	0.001	0.007	0.002

Table 6.26 (*continued*)

Variables (t-statistics)[b]	Predicted sign	*ΔTA*	*ΔDA*	*ΔABSDA*	*ΔPEROA*	*ΔPERTA*
Panel B: The U.K. cross-listing sample						
Intercept		0.001	0.076	0.017	-0.796	0.985
		(0.01)	(0.34)	(0.09)	(-0.32)	(0.31)
CL		-0.011	-0.069	-0.036	0.502	-1.730
		(-0.07)	(-0.30)	(-0.19)	(0.20)	(-0.58)
Legal enforcement		0.003	-0.010	0.001	0.048	-0.059
		(0.16)	(-0.40)	(0.07)	(0.17)	(-0.18)
CL Legal enforcement*	+	0.002	0.012	-0.001	-0.054	0.209
		(0.11)	(0.46)	(-0.04)	(-0.18)	(0.61)
SIZE		-0.008*	-0.004	-0.003	0.007	-0.223***
		(-1.86)	(-0.77)	(-0.57)	(0.12)	(-3.01)
GROWTH		-0.017	0.012	0.011	-0.015	-0.041
		(-1.39)	(0.46)	(0.82)	(-0.08)	(-0.19)
SSTK		0.001*	0.000	-0.000	0.001	0.030***
		(1.83)	(0.79)	(0.59)	(0.26)	(6.02)
LEV		0.022	-0.003	0.023	0.423	0.666
		(0.71)	(-0.06)	(0.65)	(0.90)	(1.23)
ROA		0.177***	0.195***	-0.067	0.047	2.289***
		(4.31)	(3.45)	(-1.41)	(0.08)	(3.18)
No. observations		570	570	570	570	570
Adjusted/Pseudo R^2		0.025	0.014	0.000	0.000	0.060

Table 6.26 (*continued*)

[a]This table reports the results from regressing the change in earnings quality on legal enforcement in cross-listing firms' home countries:

$$\Delta EM_{i,t} = \omega_0 + \omega_1 CL_{i,t} + \omega_2 INSTITUTIONS_i + \omega_3 CL_{i,t} \times INSTITUTIONS_i \ \omega_0 + $$
$$+ \sum_{k=4}^{n} \omega_k Controls_k + \varepsilon_{i,t} \quad \text{(4.12 modified)}$$

The estimation is based on 304 unique cross-listing firms in the U.S. (2,791 firm-year observations) and 98 unique cross-listing firms in the U.K. (570 firm-year observations).

[b]The indicator of cross-listing (*CL*) is a dummy variable that equals to 1 if a firm in a particular year is cross-listed and 0 otherwise. Legal enforcement (*INSTITUTIONS*) is measured as the mean score of La Porta et al.'s (1998) three enforcement variables: (1) efficiency of judicial system, (2) rule of law, and (3) corruption. For control variables, firm size (*SIZE*) is measured by the natural log of total assets, growth (*GROWTH*) is defined as percentage change in sales (Compustat item 12), equity issuance (*SSTK*) is the sales of common and preferred stock (Compustat item 108), financial leverage (*LEV*) is defined as total liabilities (Compustat item 181) divided by total assets, and return on assets (*ROA*) is defined as earnings before interest and taxes (Compustat item 178) divided by total assets. All variables, other than the indicator variable IPO, are winsorised at the 5th and 95th percentiles.

[c]*, **, and *** denote that the coefficient is statistically different from zero at the 0.10, 0.05, and 0.01 levels, respectively.

For the U.S. sample (Panel A), legal enforcement only appears to have a significant impact on unsigned discretionary accruals when it is interacted with the indicator variable of cross-listing status. Specifically, the ω_3 coefficient is 0.005, indicating that the slope of legal enforcement is higher for firms in the post-listing period than for firms in the pre-listing period. In other words, the ω_3 coefficient indicates that it is the joint effect of the cross-listing decision and legal enforcement that matters in influencing changes in the general propensity to manage earnings. Since the coefficient is positive, it provides evidence in support of H_{4b} that improvement in earnings quality is greater for firms domiciled in countries with relatively weak legal enforcement. In comparison, I do not find support for H_{4b} based on the U.K. sample (Panel B), as the regression analysis does not generate significant coefficient estimates for ω_2 and ω_3. The results from the robustness test are broadly consistent with the findings reported in Section 6.5.

6.7 Summary

This chapter reports the results of the four empirical studies on how firms' earnings quality is related to their choice between the U.S. and the U.K. as the cross-listing destination. Specifically, these four studies examine earnings quality of cross-listing firms (1) in the year of cross-listing vis-à-vis other years, (2) in comparison with non-cross-listing firms in their home countries, (3) in the U.S. and the U.K. host markets, and (4) from home countries with different institutions.

The first study tests Hypothesis 1 that firms manage earnings upwards in the period surrounding cross-listing. The results from the U.S. sample show that only total accruals is significantly higher in the year of cross-listing while the results for discretionary accruals, percent accruals and target beating are not significant. For the U.K. sample, the difference in earnings management, as indicated by discretionary accruals and percent operating accruals, between firms in the year of cross-listing and firms in other years is more profound. A further breakdown of firms shows that IPO and non-IPO firms engage in different levels of earnings management in the year of cross-listing. The evidence does not extend to income-increasing discretionary accruals, and hence it provides no support to the assertion that cash injections provide an incentive for IPO firms to boost earnings.

The second study tests Hypothesis 2 that cross-listing firms have better earnings quality than their home country counterparts that are not cross-listed. For the U.S. sample, the results provide mixed support because some of the accruals measures (percent total accruals and percent operating accruals) do not support the hypothesis that firms cross-listed in the U.S. have better earnings quality than their home country counterparts. For the U.K. sample, the results provide weak support to the argument because signed discretionary accruals and percent operating accruals are significantly lower for cross-listing firms after controlling for the innate factors that may affect the EM metrics. For the U.S. sample, the difference in earnings quality is greater in the post-SOX period, suggesting a positive SOX impact on the quality of earnings for firms cross-listed on the U.S. markets. The results do not provide conclusive evidence on whether the cross-listing destination has impact on the differences in earnings quality between the cross-listing firms and their home-country counterparts. It should be noted that the comparison between the two cross-listing destinations is based on a comparison of their slope coefficients, since a joint regression analysis would raise concerns about the collinearity issue.

The third study tests Hypothesis 3 that firms cross-listed on the U.S. markets have better earnings quality than firms cross-listed on the U.K. markets. Using the Heckman procedure, I estimate a choice model to explain firms' overall decisions to cross-list onto the U.S. or the U.K. markets in the first stage. The purpose of this model is to control for potential selection bias as firms self-select to cross-list on a particular market non-randomly. The results show that firms' choice of cross-listing destination is related to firm-level growth opportunities and country-level incentives such as economic proximity, economic development, and GAAP differences. These firm characteristics and country-level determinants of firms' cross-listing choice are controlled for in the second stage. The results indicate that firms cross-listed in the U.S. and U.K. markets differ significantly in their general propensity to manage earnings, although the evidence does not extend to income-increasing discretionary accruals.

The fourth study tests Hypothesis 4 that cross-listing firms with strong home-country institutions have better earnings quality while cross-listing firms with weak home-country institutions experience greater improvements in earnings quality after cross-listing. The results show that legal tradition, legal enforcement, and ownership concentration appear to exhibit some explanatory power of earnings quality for firms cross-listed in the U.S. markets. Legal tradition and outside investor rights have significant associations with some of the earnings quality measures for firms cross-listed in the U.K. markets, but the statistical significance is lower. For the U.S. sample, the difference in the tendency to report small positive earnings between cross-listing firms domiciled in common law countries and cross-listing firms domiciled in code law countries has reduced in the post-listing period. The results also show a reduced difference in the propensity to manage earnings between cross-listing firms with strong investor protection and cross-listing firms with weak investor protection. Such improvements are generally not observed in the U.K. sample.

Two robustness tests are performed to check the reliability of the results. The first robustness test excludes “the difference in local GAAP” from the cross-listing choice model (Stage One of the Heckman procedure) in testing Hypothesis 3. The second robustness test uses changes in the EM metrics to capture the notion of earnings quality improvements. The robustness tests show that the results are similar those reported in the main regression analyses.

CHAPTER 7

CONCLUSIONS

7.1 Overview

In this thesis, I investigate differences in earnings quality that might be associated with firms' choices to cross-list stocks in the U.S. and the U.K. stock exchange markets. A primary motivation of the thesis is to provide an accounting perspective to understand cross-listing activities by looking into the earnings quality and earnings management issues confronting cross-listing firms. The debate on international financial centres further motivates me to compare the U.S. and the U.K. markets as two of the most popular cross-listing destinations. Specifically, four empirical studies are conducted in this thesis to provide evidence on how the choice between the U.S. and the U.K. as the cross-listing destination may be associated with different levels of earnings quality.

The research conceives cross-listing, generally, as an outcome of managers' simultaneous consideration of the benefits and costs produced by opting into a more stringent form of regulatory environment. In Chapter 2, some of the widely recognised benefits of cross-listing are discussed, and include: (1) a strategic vehicle for reducing the cost of capital (Stulz 1981; Adler and Dumas 1983; Miller 1999), (2) an effective mechanism to facilitate cross-border capital flows and a more liquid market (Amihud and Mendelson 1986; Kadlec and McConnell 1994), (3) an increase in investors' recognition (Merton 1987; Foerster and Karolyi 1999), and (4) the potential to serve as a bonding mechanism to improve corporate governance (Stulz 1999; Coffee 1999). In the pre-SOX era, the U.S. markets are generally considered the most dynamic and interesting ones with stringent listing rules and enforcement programs. After the enactment of SOX, many perceive that the economic nature of SOX's benefits is not as clear as that of SOX's costs, raising the concern that the overall benefits of cross-listing would be eroded by the significant compliance costs. Meanwhile, London has come increasingly under the spotlight, not only for the relatively low initial listing threshold, but for the flexible approach undertaken to evaluating numerical criteria for continued listing.

In Chapter 3, two alternative arguments to explain the regulatory competition between the U.S. and the U.K. markets are discussed. The first argument conveniently interprets the phenomenon as the increasing competitiveness of London's Main Market and AIM as the markets for cross-listing. The second argument asserts that London's Main Market has been absorbing firms "screened out" by the U.S. markets (e.g. Piotroski and Srinivasan 2008; Hail and Leuz 2009; Doidge et al. 2009a). The hypotheses developed in Chapter 3 largely correspond to the second argument because it is supported by strong empirical evidence and theoretical reasoning. In particular, the theoretical framework that is used in this thesis stems from Coffee's (1999) bonding hypothesis. Using the bonding hypothesis, I posit that firms cross-listed in the U.S. markets have better earnings quality than firms cross-listed in the U.K. markets due to differences in firm characteristics, accounting standards setting procedures, and the legal and regulatory environments.

Chapter 4 discusses the research designs and models used to test the hypotheses developed in Chapter 3. Specifically, the earnings quality measures are based on Dechow et al.'s (2010) first category of earnings quality proxies, including models of accruals, persistence and predictability, smoothness, and target beating. These earnings quality measures form the basis for analysing the accounting quality of cross-listing firms after controlling for innate determinants of earnings quality in the multivariate models.

The data used for the empirical tests are described in Chapter 5. The primary data source is Compustat, which provides accounting data necessary for computing the earnings quality metrics and other control variables. The sample period spans from 1989 to 2011, a period through which cross-border investment barriers gradually dissipate and cross-listing activities become more frequent. The summary statistics show that the sample has a wide coverage of firms from different home countries and industries, while the number of cross-listing firms by year appears to have been influenced by the enactment of SOX.

7.2 Research Findings

In Chapter 6, both univariate and multivariate tests are conducted to test the four hypotheses developed in Chapter 3. In general, the results support the following conclusions:

(1) Firms manage earnings upwards in the year of cross-listing, and the evidence is more profound for firms cross-listed in the U.K. markets. In the first study (Section 6.2), time-series data for every firm are decomposed into the cross-listing year and the non-cross-listing years. Some accrual variables (total and percent accruals) are found to peak in the year of cross-listing, and the paired sample t-tests confirm that the difference is statistically significant. For the U.S. sample, the results of multivariate tests provide no evidence (total accruals only) in support of Hypothesis 1. For the U.K. sample, the difference in earnings management is indicated by discretionary accruals and percent operating accruals. A further breakdown of firms shows that, for the U.K. sample, IPO firms and non-IPO firms engage in different levels of earnings management in the year of cross-listing, while no such evidence is found for the U.S. sample.

(2) The results of the second study (Section 6.3) provide mixed evidence as to whether firms cross-listed in the U.S. have better earnings quality than the home-country firms that are not cross-listed. In comparison, the results provide weak evidence that firms cross-listed in the U.K. have better earnings quality than their home-country counterparts. This study is conducted using the matching procedure proposed by Lang et al. (2003a), which ensures that cross-listing firms are compared with non-cross-listing firms in the same home country, year, and industry group, and have the closest value for growth. Therefore, the different results for the U.S. and U.K. samples are largely attributable to the differential host-country impacts, where the U.K. markets are often considered to have less stringent reporting requirements and regulatory environments. In the U.S. sample, the difference in earnings quality is greater in the post-SOX period, suggesting a positive SOX impact on the quality of earnings for firms cross-listed in the U.S.

(3) Firms cross-listed in the U.S. and U.K. markets differ significantly in their general propensity to manage earnings (i.e. the absolute value of discretionary accruals), although the evidence does not extend to income-increasing discretionary accruals. This finding is based on the results of the third study (Section 6.4), in which firms cross-listed in the U.S. are directly compared to

firms cross-listed in the U.K. using Heckman's two-stage procedure to control for selection bias. While the cross-listing choice is found to be influenced by firm-level growth opportunities and country-level incentives in the first stage of the Heckman's procedure, selection bias does not appear to be driving the main results in Heckman's second stage regression.

(4) In the fourth study (Section 6.5), home-country institutions are found to have some influence on cross-listing firms' reporting behaviour. In particular, institutions are captured through the five measures constructed by La Porta et al. (1998), which are (1) legal origin, (2) legal tradition, (3) outside investor rights, (4) legal enforcement, and (5) ownership concentration. The regression analyses reveal that legal tradition and ownership concentration appear to exhibit some power in explaining (differences in) earnings quality for firms cross-listed in the U.S. and the U.K. markets. For the U.S. sample only, the results also indicate that strong legal enforcement in home countries may have reduced cross-listing firms' general propensity to manage earnings.

Overall, the evidence presented in this thesis supports the conclusion that differences in firm characteristics, accounting standards setting procedures, and the legal and regulatory environments have significant influences on cross-listing choices and earnings quality of cross-listing firms.

7.3 Implications of the Research

This thesis has important implications to researchers, practitioners, and regulators. In the research field, this thesis makes a contribution across various literature streams. The four studies presented in the thesis integrate the earnings quality literature and the cross-listing literature to develop an accounting perspective to understand cross-listing choices and the impacts of the host and the home countries. This research differs from previous studies in that previous studies tend to focus on the extrinsic benefits that can be obtained from a cross-listing decision such as the improvement on the cost of capital, liquidity, and prestige. For them the cross-listing decision is likely to be less motivated by intrinsic benefits such as the desire to improve governance, earnings quality, and managers' initiatives. Starting from Coffee (1999), however, researchers are increasingly interested in how a cross-listing decision may be associated with firms' commitment to improve information disclosure and governance practices (e.g. Lang et al. 2003a; Lang et al. 2006; Ndubizu, 2007). This thesis makes a contribution to the existing literature by using a variety of earnings management indicators and other earnings attributes to understand whether and how earnings quality is influenced by insider actions in the context of cross-listing.

This thesis also provides important insights for practitioners interested in listing abroad. For them, a basic question is: whether our company should list abroad and where to list? In an early survey conducted by Fanto and Karmel (1997), finance officers cite business issues, such as increased investors' recognition, as the dominant reason for cross-listing, while they almost unanimously cite the increased disclosure requirement as the greatest obstacle to cross-listing. In the new century, the focus of the practitioners appears to have been changed as they seek to increase the protection for minority shareholders and submit themselves to "high disclosure" exchanges. This thesis helps practitioners to understand the role of earnings quality in the cross-listing decision process. An important distinction of this study is its emphasis on cross-listing as a choice rather than cross-listing as a predetermined decision. The Heckman procedures used in the research simulate the cross-listing choice between the U.S. and the U.K. markets, and the findings reveal that the home country and the host country both play important roles in influencing cross-listing firms' quality of earnings.

By investigating whether a stringent regulatory environment translates into high quality of earnings, the findings have important implications for regulators. As discussed in the previous chapters, the U.S. SEC has taken a major step towards a less stringent approach by relaxing some of the reporting standards for foreign issuers. Some legal scholars raise the concern that this approach is an outcome of regulatory competition and stock markets are engaging in a race to the bottom. In this thesis, the findings suggest that the ability of cross-listing to act as a bonding mechanism is closely related to the disclosure and institutional environment in the host market. In testing Hypothesis 2b (H_{2b}), for example, it is found that cross-listing choices or the passage of SOX alone do not provide sufficient incentives for foreign firms to improve earnings quality. It is the combined effect of cross-listing and SOX that creates strong incentives for cross-listing firms to commit to better accounting practices. Therefore, standard setters and regulators should be cautious in relaxing cross-listing requirements and be conscious of the consequences of policy changes.

7.4 Limitations of the Research

Several caveats should be noted regarding the research conducted in this thesis as they may limit the interpretation of the results and hence usefulness of the conclusion. First, as in many other cross-listing studies, the choice of samples is subject to data availability. The relatively small sample size, especially the U.K. cross-listing sample, may reduce the power of the statistical tests. The sample size issue is particularly prominent when time-series properties of earnings are considered, as a rolling seven-year window per firm is required.

Second, the issue of construct validity exists when I infer earnings management from the proxies for earnings quality. Although some of the measures (e.g.

discretionary accruals and loss avoidance) are considered as, at least in the research field, attempts to examine questions of earnings management, the extent to which they directly capture the idea of "manipulation" is questionable. In a recent essay, Ball (2013, 850) wrote that researchers' incorrect belief about earnings management is "a powerful cocktail of authors' strong priors, strong ethical and moral views, limited knowledge of the determinants of accruals in the absence of manipulation, and willingness to ignore correlated omitted variables in order to report a result". While this thesis has been cautious in attributing coefficients on accruals to earnings management, some of the mixed results using signed and unsigned discretionary accruals reflect the difficulty in identifying the determinants of accounting accruals and its discretionary and non-discretionary components.

Third, some of the multivariate models have low R-squared values (e.g. Equation 4.6), which raises some concerns about the statistical inference that can be made for the model. The low explanatory power of the models suggests that some relevant variables may be omitted, and these variables may be important in explaining firms' cross-listing choices or earnings quality, but the theories and research designs are not strong enough to identify these variables.

Finally, as only two host markets (the U.S. and the U.K. markets) are studied, it may be difficult to generalise the conclusions to other cross-listing destinations. While the U.S. and U.K. are two of the leading common law systems with highly developed economies and financial markets, the findings in this thesis appear to suggest that common law systems are not homogenous in terms of their bonding roles. Other country-specific institutions such as enforcement practice and investor protection law need to be taken into account. Therefore, the conclusions may be different when, say, another two common law host markets are compared. In fact, the difference may be more profound when we look at two different legal systems.

7.5 Future Research Directions

The internationalisation of firms' operations in the increasingly globalised business environment has induced a shift in the share listings and trading of these international firms out of their domestic markets and into major international financial centres such as New York and London. Consequently, cross-listing studies have, in recent decades, become a research field of growing importance. This thesis provides a number of areas for future research.

First, as pointed out by Leuz (2006), the existing literature is ambiguous as to how the bonding mechanism can improve corporate behaviour. The theoretical framework employed in this thesis is best characterised as a static model that attempts to understand the impacts of cross-listing on earnings quality. The true process of a cross-listing decision is much more complicated, and it involves a dynamic interaction among the host market, the home market, and the firm before and after the cross-listing activity. For example, it is hypothesised in the fourth study that improvement in earnings quality is greater for cross-listing firms from home countries with weaker investor protection and legal enforcement. However, the incentive to improve earnings quality could be as great for a firm in a country that has strong investor protection and legal enforcement but low earnings quality and *vice versa*. Answering these questions requires a better understanding of theories relating to agency problems and more refined empirical tests.

Second, researchers could expand on this research by taking a broader approach to investigate more cross-listing destinations. In this thesis, the U.S. and the U.K. stock markets are chosen because they are the most popular cross-listing destinations, and their competition across time can be understood through contemporaneous events (e.g. SOX) that have caused time-series variation in their relative attractiveness. However, this is not the full picture with regard to cross-listing activities. An increasing level of global and regional integration of financial markets is expected to increase the competition among host markets. In Europe, the integration of European stock markets is facilitated by the convergence of European economies, and the EU accounting harmonisation process is a big step towards that goal. In the Asia-Pacific region, financial markets are increasingly open to foreign investment. Large stock markets such as the Hong Kong Stock Exchange (SEHK), the Tokyo Stock Exchange (TSE), and the Australian Securities Exchange (ASX) also see significant growth in listings of foreign issuers. Therefore, researchers should continue to investigate the implications of different host markets on earnings quality of cross-listing firms, which would be beneficial for understanding cross-listing choices and their consequences.

Third, the methodologies employed in this research can be improved as the volumes of data on cross-listing firms grow large. Due to data restrictions, the proxies for earnings quality used in this thesis are mainly based on Dechow et al.'s (2010) first EQ category termed "properties of earnings". The empirical evidence on time-series properties of earnings is limited due to the requirements on longitudinal data. As cross-listing activities grow and more data become available, the issue of earnings quality can be understood through other measures such as external indicators of earnings misstatements, which could be a more direct approach to examine evidence of earnings management.

7.6 Concluding Remarks

Cross-listing by foreign issuers can be traced as far back as 1928 and it is of growing popularity in the new century. The so-called bonding mechanism appears to have helped researchers and practitioners rationalise firms' decision to cross-list. However, until the current research, there has been little empirical evidence on the association between cross-listing choices and earnings quality. Apparently, there is a gap in the literature as the earnings quality issue of cross-listing firms concerns shareholders, potential investors, regulators, and accounting researchers. It is hoped that this research will be of use to regulators who are dedicated to develop strong and healthy financial markets and to practitioners who are interested in knowing whether their cross-listing choices do make a difference.

REFERENCES

Aboody, D., J. Hughes, and J. Liu. 2005. Earnings quality, insider trading, and cost of capital. *Journal of Accounting Research* 43 (5): 651–673.

Adler, M., and B. Dumas. 1983. International portfolio choice and corporation finance: A synthesis. *Journal of Finance* 38 (3): 925–984.

Alexander, G. J., C. S. Eun, and S. Janakiramanan. 1988. International listings and stock returns: Some empirical evidence. *Journal of Financial and Quantitative Analysis* 23 (2): 135–151.

Alexeev, M., and J. Kim. 2012. Bankruptcy and institutions. *Economics Letters* 117 (3): 676–678.

Ali, A., and P. Zarowin. 1992. The role of earnings levels in annual earnings-returns studies. *Journal of Accounting Research* 30 (2): 286–296.

Allen, F., and G. R. Faulhaber. 1989. Signalling by underpricing in the IPO market. *Journal of Financial Economics* 23 (2): 303–323.

Allen, F., J. Qian, and M. Qian. 2005. Law, finance, and economic growth in China. *Journal of Financial Economics* 77 (1): 57–116.

Amihud, Y., and H. Mendelson. 1986. Asset pricing and the bid-ask spread. *Journal of Financial Economics* 17 (2): 223–249.

Anderson, C., and L. Garcia-Feijoo. 2006. Empirical evidence on capital investment, growth options, and security returns. *Journal of Finance* 61 (1): 171–194.

Atkins, P. S., and B. J. Bondi. 2008. Evaluating the mission: A critical review of the history and evolution of the SEC enforcement program. *Fordham Journal of Corporate and Financial Law* 13 (3): 367–417.

Ayyagari, M., and C. Doidge. 2010. Does cross-listing facilitate changes in corporate ownership and control? *Journal of Banking and Finance* 34 (1): 208–223.

Bae, G. S., J. Jeong, H. Sun, and A. P. Tang. 2002. Stock returns and operating performance of securities issuers. *The Journal of Financial Research* 25 (3): 337–352.

Bae, K., H. Tan, and M. Welker. 2008. International GAAP differences: The impact on foreign analysts. *The Accounting Review* 83 (3): 593–628.

Baker, H. K., J. R. Nofsinger, and D. G. Weaver. 2002. International cross-listing and visibility. *Journal of Financial and Quantitative Analysis* 37 (03): 495–521.

Ball, R., and P. Brown. 1968. An empirical evaluation of accounting income numbers. *Journal of Accounting Research* 6 (2): 159–178.

Ball, R., S. P. Kothari, and A. Robin. 2000. The effect of international institutional factors on properties of accounting earnings. *Journal of Accounting and Economics* 29 (1): 1–51.

Ball, R., A. Robin, and J. S Wu. 2003. Incentives versus standards: Properties of accounting income in four East Asian countries. *Journal of Accounting and Economics* 36 (1-3): 235–270.

Ball, R., and L. Shivakumar. 2005. Earnings quality in UK private firms: Comparative loss recognition timeliness. *Journal of Accounting and Economics* 39 (1): 83–128.

Ball, R. 2013. Accounting informs investors and earnings management is rife: Two questionable beliefs. *Accounting Horizons* 27 (4): 847–853.

Bancel, F., and C. Mittoo. 2001. European managerial perceptions of the net benefits of foreign stock listings. *European Financial Management* 7 (2): 213–236.

Barth, M. E., W. R. Landsman, and M. H. Lang. 2008. International accounting standards and accounting quality. *Journal of Accounting Research* 46 (3): 467–498.

Barton, J., T. B. Hansen, and G. Pownall. 2010. Which performance measures do investors around the world value the most - and why? *The Accounting Review* 85 (3): 753–789.

Baumol, W. J., and B. G. Malkiel. 1993. Redundant regulation of foreign security trading and U.S. competitiveness. *Journal of Applied Corporate Finance* 5 (4): 19–27.

Beatty, R. P. 1989. Auditor reputation and the pricing of initial public offerings. *The Accounting Review* 64 (4): 693–709.

Beatty, A., and J. Weber. 2003. The effects of debt contracting on voluntary accounting method changes. *The Accounting Review* 78 (1): 119–142.

Beaver, W. H. 1968. Alternative accounting measures as predictors of failure. *The Accounting Review* 43 (1): 113–122.

Beck, T., A. Demirguc-Kunt, and R. Levine. 2003. Law and finance: Why does legal origin matter. *Journal of Comparative Economics* 31 (4): 653–675.

Becker, C. L., M. L. DeFond, J. Jiambalvo, and K. R. Subramanyam. 1998. The effect of audit quality on earnings management. *Contemporary Accounting Research* 15 (1): 1–24.

Bennett, B., M. E. Bradbury, and H.Prangnell. 2006. Rules, principles and judgements in accounting standards. *Abacus* 42 (2): 189–204.

Benson, J. D. 1991. Ending the Turf Wars: Support for a CFTC/SEC consolidation. *Villanova Law Review* 36 (5): 1175–1217.

Berkman, H., and N. H. Nguyen. 2010. Domestic liquidity and cross-listing in the United States. *Journal of Banking & Finance* 34 (6): 1139–1151.

Bianconi, M., and L. Tan. 2010. Cross-listing premium in the US and the UK destination. *International Review of Economics & Finance* 19 (2): 244–259.

Biddle, G. C., and S. M. Saudagaran. 1989. The effects of financial disclosure levels on firms' choices among alternative foreign stock exchange listings. *Journal of International Financial Management and Accounting* 1 (1): 55–87.

Black, F. 1974. International capital market equilibrium with investment barriers. *Journal of Financial Economics* 1 (4), 337–352.

Black, B. S. 2001. The legal and institutional preconditions for strong securities markets. *UCLA Law Review* 48 (4): 781–816.

Black, J. 2008. Forms and paradoxes of principles-based regulation. *Capital Markets Law Journal* 3 (4): 425–457.

Burgstahler, D. C., and I. Dichev. 1997. Earnings management to avoid earnings decreases and losses. *Journal of Accounting and Economics* 24 (1): 99–126.

Burgstahler, D. C., L. Hail, and C. Leuz. 2006. The importance of reporting incentives: Earnings management in European private and public firms. *The Accounting Review* 81 (5): 983–1016.

Cahan, S. F., D. Emanuel, and J. Sun. 2009. The effect of earnings quality and country-level institutions on the value relevance of earnings. *Review of Quantitative Finance and Accounting* 33 (4): 371–391.

Chakravarty, S., A. Sarkar, and L. Wu. 1998. Information asymmetry, market segmentation and the pricing of cross-listed shares: Theory and evidence from

Chinese A and B shares. *Journal of International Financial Markets, Institutions and Money* 8 (3): 325–356.

Champagne, C., and L. Kryzanowski. 2009. Do internationally cross-listed non-US firms obtain more favorable terms for syndicated loans? *Managerial Finance* 35 (7): 548–578.

Chemmanur, T. J., and P. Fulghieri. 2006. Competition and cooperation among exchanges: A theory of cross-listing and endogenous listing standards. *Journal of Financial Economics* 82 (2): 455–489.

Chiu, I. H. 2008. *Regulatory convergence in EU securities regulation.* Alphen aan den Rijn, The Netherlands: Kluwer Law International.

Choi, S. J., and A. T. Guzman. 1997. Protable reciprocity: Rethinking the international reach of securities regulation. *Southern California Law Review* 71 (5): 903–951.

Claessens, S., S. Djankov, J. P. H. Fan, and L. H. P. Lang. 2002. Disentangling the incentive and entrenchment effects of large shareholdings. *The Journal of Finance* 57 (6): 2741–2771.

Coffee, J. C. 1999. The future as history: the prospects for global convergence in corporate governance and its implications. *Northwestern University Law Review* 93 (3): 641–708.

Cohen, D. A., A. Dey, and T. Z. Lys. 2008. Real and accrual-based earnings management in the pre- and post-Sarbanes-Oxley periods. *The Accounting Review* 83 (3): 757–787.

Cotten, B. D. 2008. Earnings management prior to initial public offerings: Evidence from secondary share data. *Quarterly Journal of Finance and Accounting* 47 (4): 87–107.

Cox, J. D., R. S. Thomas, and D. Kiku. 2003. SEC enforcement heuristics: An empirical inquiry. *Duke Law Journal* 53 (2): 737–779.

Dechow, P. M., R. G. Sloan, and A. P. Sweeney. 1995. Detecting earnings management. *The Accounting Review* 70 (2): 193–225

Dechow, P. M., and D. J. Skinner. 2000. Earnings management: Reconciling the views of accounting academics, practitioners, and regulators. *Accounting Horizons* 14 (2): 235–250.

Dechow, P. M., and I. D. Dichev. 2002. The quality of accruals and earnings: The role of accrual estimation errors. *The Accounting Review.* 77 (s-1): 35–59.

Dechow, P. M., S. A. Richardson, and I. Tuna. 2003. Why are earnings kinky? An examination of the earnings management explanation. *Review of Accounting Studies* 8 (2): 355–384.

Dechow, P. M., W. Ge, and C. Schrand: 2010. Understanding earnings quality: A review of the proxies, their determinants and their consequences. *Journal of Accounting and Economics* 50 (2): 344–401.

Dechow, P. M., W. Ge, C. R. Larson, and R. G. Sloan. 2011. Predicting material accounting misstatements. *Contemporary Accounting Research* 28 (1): 17–82.

DeFond, M. L., and J. Jiambalvo. 1994. Debt covenant violation and manipulation of accruals. *Journal of Accounting and Economics* 17 (1): 145–176.

DeFond, M. L., and J. R. Francis. 2005. Audit research after Sarbanes-Oxley. *Auditing: A Journal of Practice Theory* 24 (Supplement): 5–30.

Degeorge, F., and R. Zeckhauser. 1993. The reverse LBO decision and firm performance: Theory and Evidence. *The Journal of Finance* 48 (4): 1323–1348.

Degeorge, F., J. Patel, and R. Zeckhauser. 1999. Earnings management to exceed thresholds. *Journal of Business* 72 (1): 1–33.

Demski, J. 1998. Performance measure manipulation. *Contemporary Accounting Research* 15 (3): 261–285.

Dichev, I. D., and V. W. Tang. 2009. Earnings volatility and earnings predictability. *Journal of Accounting and Economics* 47 (1-2): 160–181.

Doidge, C., G. A. Karolyi, and R. M. Stulz. 2004. Why are foreign firms that are listed in the U.S. worth more? *Journal of Financial Economics* 71 (2):

205–238.

Doidge, C., G. A. Karolyi, and R. M. Stulz. 2007. Why do countries matter so much for corporate governance? *Journal of Financial Economics* 86 (1): 1–39.

Doidge, C., G. A. Karolyi, and R. M. Stulz. 2009a. Has New York become less competitive than London in global markets? Evaluating foreign listing choices over time. *Journal of Financial Economics* 91 (3): 253–277.

Doidge, C., G. A. Karolyi, K. V. Lins, D. P. Miller, and R. M. Stulz. 2009b. Private benefits of control, ownership, and the cross-listing decision. *The Journal of Finance* 64 (1): 425–466.

Easton, P. D., and M. E. Zmijewski. 1989. Cross-sectional variation in the stock market response to accounting earnings annoucements. *Journal of Accounting and Economics* 11 (2): 117–141.

Ecker, F., J. Francis, P. Olsson, and K. Schipper. 2013. Estimation sample of selection for discretionary accruals models. *The Journal of Accounting and Economics* 56 (2-3): 190–211.

Eleswarapu, V. R., and K. Venkataraman. 2006. The impact of legal and political institutions on equity trading costs: A cross-country analysis. *Review of Financial Studies* 19 (3): 1081–1111.

Eun, C. S., and S. Sabherwal. 2003. Cross-border listings and price discovery:

Evidence from U.S.-listed Canadian stocks. *The Journal of Finance* 58 (2): 549–575.

Fairfield, P. M., J. S. Whisenant, and T. L. Yohn. 2003. Accrued earnings and growth: Implications for future profitability and market mispricing. *The Accounting Review* 78 (1): 353–371.

Fanto, J. A., and R. S. Karmel. 1997. A report on the attitudes of foreign companies regardng a U.S. listing. *Stanford Journal of Law, Business and Finance* 3 (1): 51–75.

Fernandes, N., and M. A. Ferreira. 2008. Does international cross-listing improve the information environment. *Journal of Financial Economics* 88 (2): 216–244.

Foerster, S. R., and G. A. Karolyi. 1999. The effects of market segmentation and investor recognition on asset prices: Evidence from foreign stocks listing in the United States. *The Journal of Finance* 55 (3): 981–1013.

Ford, C. L. 2008. New governance, compliance, and principles-based securities regulation. *American Business Law Journal* 45 (1): 1–60.

Francis, J., R. LaFond, P. Olsson, and K. Schipper. 2004. Cost of equity and earnings attributes. *The Accounting Review* 79 (4): 967–1010.

Francis, J., R. LaFond, P. Olsson, and K. Schipper. 2005. The market pricing of accruals quality. *Journal of Accounting and Economics* 39 (2): 295–327.

Francis, J. R., and D. Wang. 2008. The joint effect of investor protection and Big 4 audits on earnings quality around the world. *Contemporary Accounting Research* 25 (1): 157–191.

Frankel, R. M., M. F. Johnson, and K. K. Nelson. 2002. The relation between auditors' fees for nonaudit services and earnings management. *The Accounting Review.* 77 (s-1): 71–105.

Frijns, B., A. Gilbert, and A. Tourani-Rad. 2010. The dynamics of price discovery for cross-listed shares: Evidence from Australia and New Zealand. *Journal of Banking and Finance* 34 (3): 498–508.

Frost, C. A., E. Henry, and S. W. Lin. 2009. Response to the U.S. Securities and Exchange's proposed rule: Roadmap for the potential use of financial statements prepared in accordance with International Financial Reporting Standards by U.S. issuers. *Journal of International Accounting Research* 8 (2): 61–85.

Financial Services Authority (FSA). 2005. Better regulation action plan - What we have done and what we are doing. Retrieved March 2013 from http://www.fsa.gov.uk/pubs/other/better_regulation.pdf

Gadinis, S. 2008. The politics of competition in international financial regulation. *Harvard International Law Journal* 49 (2): 447–508.

Gaver, J. J., K. M. Gaver, and J. R. Austin. 1995. Additional evidence on bonus plans and income management. *Journal of Accounting and Economics* 19 (1): 3–28.

Gerakos, J., M. H. Lang, and M. G. Maffett. 2013. Post-listing performance and private sector regulation: The experience of London's Alternative Investment Market. *Journal of Accounting and Economics* 56 (2-3): 189–215.

Gozzi, J. C., R. Levine, and S. L. Schmukler. 2008. Internationalization and the evolution of corporate valuation. *Journal of Financial Economics* 88 (3): 607–632.

Grinblatt, M., and M. Keloharju. 2001. How distance, language, and culture influence stockholdings and trades. *Journal of Finance* 56 (3): 1053–1073.

Hafzalla, N., R. Lundholm, and E. M. Winkle. 2011. Percent accruals. *The Accounting Review* 86 (1): 209–236.

Hail, L., and C. Leuz. 2009. Cost of capital effects and changes in growth expectations around U.S. cross-listings. *Journal of Financial Economics* 93 (3): 428–454.

Harris, M. S., and K. A. Muller. 1999. The market valuation of IAS versus US GAAP accounting measures using Form 20-F reconciliations. *Journal of Accounting and Economics* 26 (1-3): 285–312.

Hayn, C. 1995. The information content of losses. *Journal of Accounting and*

Economics 20 (2): 125–153.

Healy, P. M. 1985. The effect of bonus schemes on accounting decisions. *Journal of Accounting and Economics* 7 (1-3): 85–107.

Healy, P. M., and J. M. Wahlen. 1999. A review of the earnings management literature and its implications for standard setting. *Accounting Horizons* 13 (4): 365–383.

Heckman, J. J. 1976. The common structure of statistical models of truncation, sample selection and limited dependent variables and a simple estimator for such models. *Annals of Economic and Social Measurement* 5 (4): 475–492.

Heckman, J. J. 1979. Sample selection as a specification error. *Econometrica* 47 (1): 153–161.

Henry, P. B. 2000. Do stock market liberalizations cause investment booms? *Journal of Financial Economics* 58 (1): 301–334.

Hopkins, P. E., C. A. Botosan, M. T. Bradshaw, C. M. Callahan, J. Ciesielski, D. B. Farber, L. D. Hodder, M. J. Kohlbeck, R. Laux, T. L. Stober, P. C. Stocken, and T. L. Yohn. 2008. Response to the SEC release: Acceptance from foreign private issuers of financial statements prepared in accordance with International Financial Reporting Standards without reconciliation to U.S. GAAP File No. S7–13–07. *Accounting Horizons* 22 (2): 223–240.

Hribar, P., and D. W. Collins. 2002. Errors in estimating accruals: Implications for empirical research. *Journal of Accounting Research* 40 (1): 105–134.

Hribar, P., and C. Nichols. 2007. The use of unsigned earnings quality measures in tests of earnings management. *Journal of Accounting Research* 45 (5): 1017–1053.

Huang, R. D., and H. R. Stoll. 1996. Dealer versus auction markets: A paired comparison of execution costs on NASDAQ and the NYSE. *Journal of Financial Economics* 41 (3): 313–357.

J. P. Morgan. 2007. JPMorgan celebrates 80th anniversary of the ADR. Retrieved January 2013 from http://www.jpmorgan.com/tss/General/JPMorgan_Celebrates_80th_Anniversary_of_the_ADR/1159308558253

J.P. Morgan. 2013. Find out about DRs. Retrieved March 2013 from https://www.adr.com/Education/AboutDRs

Jain, B. A., and O. Kini. 1994. The post-issue operating performance of IPO firms. *The Journal of Finance* 49 (5): 1699–1726.

Jayaraman, N., K. Shastri, and K. Tandon. 1993. The impact of international cross listings on risk and return: The evidence from American Depository Receipts. *Journal of Banking and Finance* 17 (1): 91–103.

Jones, J. 1991. Earnings management during import relief investigations. *Journal of*

Accounting Research 29 (2): 193–228.

Jones, K. L., G. V. Krishnan, and K. D. Melendrez. 2008. Do models of discretionary accruals detect actual cases of fraudulent and restated earnings? An empirical analysis. *Contemporary Accounting Research* 25 (2): 499–531.

Kadlec, G. B., and J. J. McConnell. 1994. The effect of market segmentation and illiquidity on asset prices: Evidence from exchange listings. *The Journal of Finance* 49 (2): 611–636.

Kang, J. K., and R. Stulz. 1997. Why is there a home bias? An analysis of foreign portfolio equity ownership in Japan. *Journal of Financial Economics* 46 (1): 3–28.

Kang, S., and K. Sivaramakrishnan. 1995. Issues in testing earnings management and an instrumental variable approach. *Journal of Accounting Research* 33 (2): 353–367.

Kang, T., G. V. Krishnan, M. C. Wolfe, and H. S. Yi. 2012. The impact of eliminating the 20-F reconciliation requirement for IFRS filers on earnings persistence and information uncertainty. *Accounting Horizons* 26 (4): 741–765.

Karolyi, A. G. 2006. The world of cross-listings and cross-listings of the world: challenging conventional wisdom. *Review of Finance* 10 (1): 99–152.

Kasznik, R. 1999. On the association between voluntary disclosure and earnings management. *Journal of Accounting Research* 37 (1): 57–81.

Kim, Y., H. Li, and S. Li. 2012. Does eliminating the Form 20-F reconciliation from IFRS to U.S. GAAP have capital market consequences? *Journal of Accounting and Economics* 53 (1): 249–270.

Kothari, S., A. Leone, and C. Wasley. 2005. Performance matched discretionary accrual measures. *Journal of Accounting and Economics* 39 (1): 163–197.

La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R. Vishny. 1997. Legal determinants of external finance. *The Journal of Finance* 52 (3): 1131–1150.

La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R. Vishny. 1998. Law and finance. *Journal of Political Economy* 106 (6): 1113–1155.

La Porta, R., F. Lopez-de-Silanes, and A. Shleifer. 1999. Corporate ownership around the world. *Journal of Finance* 54 (2): 471–517.

La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R. Vishny. 2000. Investor protection and corporate governance. *Journal of Financial Economics* 58 (1-2): 3–27.

Lang, M., J. S. Raedy, and M. H. Yetman. 2003a. How representative are firms that are cross-listed in the United States? An analysis of accounting quality. *Journal of Accounting Research* 41 (2): 363–386.

Lang, M., V. Lins, and D. Miller. 2003b. ADRs, analysts, and accuracy. Does cross listing in the United States improve a firm's information environment and increase market value? *Journal of Accounting Research* 41 (2): 317–345.

Lang, M., J. S. Raedy, and W. Wilson. 2006. Earnings management and cross-listing: Are reconciled earnings comparable to US earnings? *Journal of Accounting and Economics* 42 (1-2): 255–283.

Langevoort, D. C. 2008. U.S. securities regulation and global competition. *Virginia Law and Business Review* 3 (2): 191–205.

Lehavy, R., and R. G. Sloan. 2008. Investor recognition and stock returns. *Review of Accounting Studies* 13 (2-3): 327–361.

Lel, U., and D. P. Miller. 2008. International cross-listing, firm performance, and top management turnover: A test of the bonding hypothesis. *The Journal of Finance* 63 (4): 1897–1937.

Lennox, C. S., J. R. Francis, and Z. Wang. 2012. Selection models in accounting research. *The Accounting Review* 87 (2): 589–616.

Leuz, C., D. Nanda, and P. D. Wysocki. 2003. Earnings management and investor protection: An international comparison. *Journal of Financial Economics* 69 (3): 505–527.

Leuz, C. 2006. Cross listing, bonding and firms' reporting incentives: A discussion of Lang, Raedy and Wilson (2006). *Journal of Accounting and Economics* 42 (1):

285–299.

Lev, B. 1983. Some economic determinants of the time-series properties of earnings. *Journal of Accounting and Economics* 5 (1): 31–38.

Levine, R., and S. L. Schmukler. 2007. Migration, spillovers, and trade diversion: The impact of internationalization on domestic stock market activity. *Journal of Banking and Finance* 31 (6): 1595–1612.

Levitt, A. 1998. The numbers game. Speech delivered at the New York University, Center for Law and Business, September 28.

Licht, A. 1998. *Stock market integration in Europe.* Working paper, Harvard Institute for International Development.

Licht, A. N. 2003. Cross-listing and corporate governance: Bonding or avoiding. *Chicago Journal of International Law* 4 (1): 141–163.

Licht, A. N. 2004. Legal plug-ins: Cultural distance, cross-listing, and corporate governance reform. *Berkeley Journal of International Law* 22 (2): 195–239.

Lins, K. V., D. Strickland, and M. Zenner. 2005. Do non-U.S. firms issue equity on U.S. stock exchanges to relax capital constraints? *Journal of Financial and Quantitative Analysis* 40 (1): 109–133.

Lipe, R. 1990. The relation between stock returns and accounting earnings given alternative information. *The Accounting Review* 65 (1): 49–71.

Litvak, K. 2007. The effect of the Sarbanes-Oxley act on non-US companies cross-listed in the US. *Journal of Corporate Finance* 13 (2-3): 195–228.

London Stock Exchange. 2010. A guide to listing on the London Stock Exchange. Retrieved March 2013 from http://www.londonstockexchange.com/home/guide-to-listing.pdf

London Stock Exchange. 2013a. Market statistics. Retrieved March 2013 from http://www.londonstockexchange.com/statistics/historic/aim/feb-2013.pdf

London Stock Exchange. 2013b. Our history. Retrieved March 2013 from http://www.londonstockexchange.com/about-the-exchange/company-overview/our-history/our-history.htm

Loughran, T., and J. Ritter. 1997. The operating performance of firms conducting seasoned equity offerings. *Journal of Finance* 52 (5): 1823–1850.

MacNeil, I. 2001. *Competition and convergence in corporate regulation: The case of overseas listed companies.* Working Paper, University of Glasgow.

Merton, R. 1987. A simple model of capital market equilibrium with incomplete information. *Journal of Finance* 42(3): 483–510.

Miller, D. P. 1999. The market reaction to international cross-listings: Evidence from Depositary Receipts. *Journal of Financial Economics* 51 (1): 103–123.

Modigliani, F., and M. Miller. 1958. The cost of capital, corporation finance and the theory of investment. *American Economic Review* 48 (3): 261–297.

Modigliani, F., and M. Miller. 1963. Corporate income taxes and the cost of capital: A correction. *American Economic Review* 53 (3): 433–443.

Mullins, D. W. 1982. Does the capital asset pricing model work? *Harvard Business Review* 60 (1): 105–113.

Napo Pharmaceuticals. 2008. London Stock Exchange welcomes first U.S.-incorporated company to IPO on the Main Market. Retrieved Oct 2008 from http://www.napopharma.com/news/First_LSE_Main_Market_Flotation.html

NASDAQ OMX Group. 2013. 5315 initial listing requirements for primary equity securities. Retrieved March 2013from http://nasdaq.cchwallstreet.com/NASDAQTools/PlatformViewer.asp?selectednode=chp_1_1_4_3_5_3&manual=%2Fnasdaq%2Fmain%2Fnasdaq-equityrules%2F

Ndubizu, G. A. 2007. Do cross-border listing firms manage earnings or seize a window of opportunity? *The Accounting Review* 82 (4): 1009–1030.

NYSE. 2013. Section 1 The Listing Process. Retrieved March 2013 from http://nysemanual.nyse.com/LCMTools/PlatformViewer.asp?searched=1&selectednode=chp_1_2_3_2&CiRestriction=103.01&manual=%2Flcm%2Fsection

s%2Flcm-sections%2F

Pagano, M., F. Panetta, and L. Zingales. 1998. Why do companies go public? An empirical analysis. *The Journal of Finance* 53 (1): 27–64.

Pagano, M., A. Roell, and J. Zehner. 2002. The geography of equity listings: Why do companies list abroad? *The Journal of Finance* 57 (6): 2379–2856.

Pan, E. 2006. *Why the world no longer puts its stock in us.* Working paper, Yeshiva University.

Pederson, J. P. 2002. *International directory of company histories: Volume 45.* Chicago: St. James Press.

Penman, S. H., and X. Zhang. 2002. Accounting conservatism, the quality of earnings, and stock returns. *The Accounting Review* 77 (2): 237–264.

Piotroski, J. D., and S. Srinivasan. 2008. Regulation and bonding: The Sarbanes-Oxley Act and the flow of international listings. *Journal of Accounting Research* 46 (2): 383–425.

Posner, E. 2009. *The origins of Europe's new stock markets.* London, U.K.: Harvard University Press.

Prentice, R. 2007. Sarbanes-Oxley: The evidence regarding the impact of SOX 404. *Cardozo Law Review* 29 (2): 703–764.

Press, E. G., and J. B. Weintrop. 1990. Accounting-based constraints in public and private debt agreements: Their association with leverage and impact on accounting choice. *Journal of Accounting and Economics* 12 (1): 65–95.

Pulatkonak, M., and G. Sofianos. 1999. *The distribution of global trading in NYSE-listed Non-U.S. stocks.* Working paper, New York Stock Exchange.

Rajan, R. G., and L. Zingales. 2003. The great reversals: The politics of financial development in the twentieth century. *Journal of Financial Economics* 69 (1): 5–50.

Rangan, S. 1998. Earnings management and the performance of seasoned equity offerings. *Journal of Financial Economics* 50 (1): 101–122.

Rao, G. 1993. *The relation between stock returns and earnings: A study of newly-public firms.* Working Paper, University of Illinois.

Reinganum, M. R. 1990. Market microstructure and asset pricing: An empirical investigation of NYSE and NASDAQ securities. *Journal of Financial Economics* 28 (1-2): 127–147.

Renders, A., and A. Gaeremynck. 2007. The impact of legal and voluntary investor protection on the early adoption of international financial reporting standards (IFRS). *De Economist* 155 (1): 49–72.

Richardson, S. A., R. G. Sloan, M. T. Soliman, and I. Tuna. 2005a. Accrual reliability, earnings persistence and stock prices. *Journal of Accounting and Economics*

39 (3): 437–485.

Richardson, S. R., M. S. Sloan, and I. Tuna. 2005b. Accrual reliability, earnings persistence and stock prices. *Journal of Accounting and Economics* 39 (3): 437–485.

Richardson, S. A., R. G. Sloan, M. T. Soliman, and I. Tuna. 2006. The implications of accounting distortions and growth for accruals and profitability. *The Accounting Review* 81 (3): 713–743.

Ritter, J. R. 1991. The long-run performance of initial public offerings. *The Journal of Finance* 46 (1): 3–27.

Romano, R. 1998. Empowering investors: A market approach to securities regulation. *The Yale Law Journal* 107 (8): 2359–2430.

Ronen, J., and S. Sadan. 1981. *Smoothing income numbers: Objectives, means and implications.* Reading, MA: Addison Wesley.

Roosenboom, P., and M. A. Dijk. 2009. The market reaction to cross-listings: Does the destination market matter? *Journal of Banking and Finance* 33 (10): 1898–1908.

Sarkissian, S., and M. J. Schill. 2004. The overseas listing decision: New evidence of proximity preference. *The Review of Financial Studies* 17 (3): 769–809.

Sarkissian, S., and M. J. Schill. 2012. *Cross-listing waves.* Working Paper, University of Virginia.

Seetharaman, A., F. A. Gul, and S. G. Lynn. 2002. Litigation risk and audit fees: Evidence from UK firms cross-listed on US markets. *Journal of Accounting and Economics* 33 (1): 91–115.

Shleifer, A., and R. W. Vishny. 1997. A survey of corporate governance. *The Journal of Finance* 53 (2): 737–783.

Siegel, J. 2005. Can foreign firms bond themselves effectively by renting U.S. securities laws? *Journal of Financial Economics* 75 (2): 319–359.

Sloan, R. G. 1996. Do stock prices fully reflect information in accruals and cash flows about future earnings? *The Accounting Review* 71 (3): 289–315.

Smith, K., and G. Sofianos. 1997. The impact of an NYSE listing on the global trading of non-US stocks. Working paper, New York Stock Exchange.

Solomon, J. 2010. *Corporate governance and accountability.* 3rd edition. West Sussex, UK: John Wiley and Sons Ltd.

Stapleton, R. C., and M. G. Subrahmanyam. 1977. Market imperfections, capital market equilibrium and corporation finance. *The Journal of Finance* 32 (2): 307–319.

Stulz, R. M. 1981. On the effects of barriers to international investment. *The Journal of Finance* 36 (4): 923–934.

Stulz, R. M. 1999. Globalization, corporate finance, and the cost of capital. *Journal of Applied Finance* 12 (3): 8-25.

Sutton, M. 1997. Financial reporting in U.S. capital markets: International dimensions. *Accounting Horizons* 11 (2): 96–102.

Teoh, S. H., I. Welch, and T. J. Wong. 1998. Earnings management and the long-run market performance of initial public offerings. *Journal of Finance* 53 (6): 1935–1974.

Tinic, S. M., and R. R. West. 1974. Marketability of common stocks in Canada and the U.S.A.: A comparison of agent versus dealer dominated markets. *Journal of Finance* 29 (3): 729–746.

Trueman, B., and S. Titman. 1988. An explanation for accounting income smoothing. *Journal of Accounting Research* 26: 127–139.

Tucker, J. 2010. Selection bias and econometric remedies in accounting and finance research. *Journal of Accounting Literature* 29: 31–57.

Warfield, T. D., J. J. Wild, and K. L. Wild. 1995. Managerial ownership, accounting choices, and informativeness of earnings. *Journal of Accounting and Economics* 20 (1): 61–91.

Watts, R. L., and J. L. Zimmerman. 1990. Positive accounting theory: A ten year perspective. *The Accounting Review* 65 (1): 131–156.

Woo, C. 2006. *The effects of the Sarbanes-Oxley Act on foreign private issuers.* Working paper, Harvard University.

World Federation of Exchanges. (2012). Annual query tool. Retrieved January 2013 from http://www.world-exchanges.org/statistics/annual-query-tool

Xie, H. 2001. The mispricing of abnormal accruals. *The Accounting Review* 76 (3): 357–373.

Ying, L. K., W. G. Lewellen, G. G. Schlarbaum, and R. C. Lease. 1977. Stock exchange listings and securities returns. *Journal of Financial and Quantitative Analysis* 12 (03): 415–432.

Zingales, L. 1995. Insider ownership and the decision to go public. *Review of Economic Studies* 62 (3): 425–448.

Zingales, L. 2007. *Is the U.S. capital market losing its competitive edge?* Working paper, University of Chicago.