MASTER'S THESIS

ACCOUNTANCY, AUDITING & CONTROL

THE ECONOMIC CONSEQUENCES OF CROSS-DELISTING

THE IMPORTANCE OF DIFFERENCES IN LEGAL ENVIRONMENTS BETWEEN THE US AND HOME COUNTRIES

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Abstract: The main purpose of this master's thesis is to examine the economic consequences of cross-delisting. More specifically, this study investigates the effect of a foreign firm being cross-delisted from one of the three major U.S. stock exchanges (NYSE, NASDAQ and AMEX) on information asymmetry and liquidity, taking into account the legal environments of the home countries. I focus on the differences in legal systems between the US and other countries to examine the influences of these differences on the association between cross-delisting, information asymmetry and liquidity. By evaluating the results of this study, I find no evidence to suggest that cross-listed firms that cross-delist from the U.S. stock exchanges face an increase in information asymmetry or a decrease in liquidity. I also find no evidence that the effect is more pronounced for firms originating from countries with a weaker legal environment than the US. Nonetheless, the results indicate that, in general, the difference in the level of legal environment between the US and the firm's home country is still of importance for investors. This can be used by regulators and other public policy makers to emphasise the importance of continuous improvements in laws, regulations and their enforcements. The findings give also new insights in the behaviour of the key stakeholders and could be used to predict their reactions on future cross-delistings.

Keywords: *Cross-delisting, Economic Consequences, Information Asymmetry, Liquidity, Legal Environment, Bonding Hypothesis, Liquidity Hypothesis*

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1. Introduction

The purpose of this master's thesis is to examine the economic consequences of cross-delisting. More specifically, this thesis investigates the effect of a foreign firm being cross-delisted from U.S. stock exchanges on information asymmetry and liquidity, taking into account the legal environments of the home countries. It focusses on the differences in legal systems between countries and the moderating effect of these differences on the association between cross-delisting, information asymmetry and liquidity. The following research question is answered: *Do differences in countries' legal environments affect the economic consequences of cross-delisting from U.S. stock exchanges?* Answering this research question is important because the choice that cross-listed firms have to cross-delist is a significant one-off decision. Furthermore, the consequences of such an event are not particularly clear, given that earlier studies have focussed relatively more on the causes and consequences of cross-listing for the simple reason that there was a trend of non-U.S. firms cross-listing in the US for a long time (Karolyi, 2006). Almost all of the reasons that firms have to cross-list are based on theories about asymmetric information (Witmer, 2005). The most important explanations for cross-delisting used in the current study are in line with the bonding and liquidity hypotheses. The bonding hypothesis of Coffee (2002) posits that firms want to cross-list to escape a weak legal environment and subject themselves voluntarily to better and higher-quality regulations by bonding themselves to a stricter legal system. In addition to the bonding hypothesis, the liquidity hypothesis is also important in this study, as it identifies another motivation that managers have to cross-list. Using letters and interviews, Fanto and Karmel (1999) find that firms decide to cross-list to increase the liquidity of their shares. Moreover, U.S. exchanges provide different benefits for cross-listed firms, such as cheapness and the possibility to supply large amounts of equity on the U.S. capital markets (Fanto & Karmel, 1999). Both the bonding and liquidity hypotheses indicate that a firm chooses to cross-list as a credible way to communicate inside information about its value to investors and thus reduce its information asymmetry costs. Nevertheless, cross-(de)listing is not a costless process for a firm. Reese and Weisbach (2002) suggest that cross-listing in the US increases the disclosure and regulatory costs that a firm faces. In addition, a firm must also meet additional direct costs to cross-list on U.S. stock exchanges. As a result, cross-listing is not beneficial for all foreign firms. There is also mixed support for both the bonding and liquidity hypotheses. In contrast to these hypotheses, the avoiding hypothesis assumes that firms are less likely to cross-list or more likely to cross-delist when the compliance and other costs of cross-listing are higher due to the large gap in regulatory requirements among countries. Given these points, the aim of this thesis

is to fill the gap in the literature about the economic consequences of cross-delisting and to try to find support for the bonding and liquidity hypotheses. I believe that cross-delisting will affect the information environment of a firm and the liquidity of its shares. Furthermore, I expect that differences in legal environments among countries will influence the economic consequences of cross-delisting. La Porta, Lopez-de-Silanes, Shleifer and Vishny (1996, 1997, 2000) were some of the first researchers to emphasise the importance of a country's legal environment for financial systems. Because each country has its own unique laws, regulations and institutions, differences arise in the quality of their legal environments. These differences in legal systems mean that the level of information also differs among countries. The results of this thesis are important because problems related to information asymmetry can hinder the efficient allocation of resources in capital markets. Consequently, the results of this thesis should be relevant to investors and lenders doing business with cross-listed firms, because the decision to cross-delist may have consequences (such as the loss of money to insiders who take advantage of increased information asymmetry). This thesis is also of value to non-self-interested managers who care about share liquidity and the degree of transparency within their firms. Finally, the outcomes of this thesis are of value to regulators worldwide who aim to improve the legal environment for stakeholders and to researchers interested in the economic consequences of cross-delisting.

This thesis attempts to answer the research question by examining two different samples. The first sample is a sample of cross-listed foreign firms that have chosen to cross-delist from one of the three major U.S. stock exchanges (NYSE, NASDAQ and AMEX). The second sample consists of foreign firms that are staying cross-listed on one of the same U.S. exchanges. The sample period in this study is from 2004 to 2012 because the Sarbanes-Oxley Act (SOX) of 2002 set new or expanded requirements for all U.S. listed companies. Zhu and Small (2007) show that the number of new cross-listings significantly declined and that the number of cross-delistings increased in the US after the SOX. This event study uses the *difference-in-differences* method to examine the effect of a country's legal environment on the association between cross-delisting, information asymmetry and liquidity. Each year, Kaufmann, Kraay and Mastruzzi (2009, 2011) provide the World Governance Indicators (WGI) that rank 215 economies around the world based on, *inter alia*, the quality of their legal systems. This thesis uses parts of the WGI and a self-made index based on the 2015 WGI to measure the level of legal environment in a country. Measuring information asymmetry is done using analyst coverage and the bid-ask spread. In addition, share turnover is used to operationalise liquidity.

By evaluating the results of this study, I find no evidence to suggest that cross-listed firms that cross-delist from the U.S. stock exchanges face an increase in information asymmetry or a decrease in liquidity. I also find no evidence that the effect is more pronounced for firms originating from countries with a weaker legal environment than the US. This means that the results are not consistent with the expectations. The results show that the event of cross-delisting does not have a significant effect on analyst coverage, bid-ask spread or share turnover. Additionally, the moderating effects of regulatory quality, rule of law, control of corruption and the combined one are not significant in any model. Nonetheless, the results indicate that, in general, the difference in the level of legal environment between the US and a firm's home country is still of importance to investors, because firms originating from a country with a weaker legal environment than the US have less analyst coverage, which means larger information asymmetry.

The contribution of this thesis is threefold. First, it adds to the current bonding and liquidity debate. Although many studies find support for the bonding and liquidity hypotheses, others find mixed results. For example, Siegel (2005) shows that cross-listed firms experience relatively less enforcement by the Securities and Exchange Commission (SEC) and U.S. courts compared to other firms in the US. Licht (2003) questions the bonding role of cross-listing and argues that the role has been overstated. Actually, the evidence provided by Licht supports the avoiding hypothesis. Licht also suggests that the net effect of liquidity is different for each firm. Although enhanced inter-market competition might lower the spread and therefore improve liquidity, multimarket trading might also decrease liquidity by fragmenting order flows among markets (Licht, 2003). According to the bonding and liquidity hypotheses, cross-listed firms from a weak legal environment should benefit most from cross-listing (Baker, Nofsinger & Weaver, 2002). On the other hand, compliance and other additional costs are higher, making it less attractive to stay cross-listed (Witmer, 2005). Given these points, it seems that there is a tension within cross-listed firms between the costs and benefits that cross-listing entails. Second, this thesis aims to contribute to the literature about cross-delisting. Research is relatively limited on its economic consequences, and no prior research has taken the legal environment of different countries into account. Such research is important because the magnitude of the consequences of cross-delisting can be different from those of cross-listing. A reason for this could be that the level of trust in a firm and its degree of visibility differ at the moment that a firm decides to cross-list or cross-delist. Third, this thesis aims to contribute to previous studies about asymmetric information and liquidity. It can provide new insights into the behaviour of investors by examining the economic consequences of cross-delisting.

The findings of this master's thesis will contribute to a better understanding of the relationships between cross-delisting, legal environment, information asymmetry and liquidity.

The findings show the importance of the level of legal environment in a country for the degree of information asymmetry between the insiders and outsiders of a firm. This is in line with the studies of La Porta et al. (1996, 1997, 2000) and contributes to their statement which suggests that a country's legal environment matters for financial systems and that it influences the economic consequences. This could change the way of thinking about the importance of legal environment in a country and can be used by regulators and other public policy makers to emphasise how essential improvements are in laws, regulations and their enforcements. The findings also suggest that key stakeholders, especially investors and financial analysts, do not react differently based on results to firms that cross-delist and to firms that stay cross-listed even if the originating country has a weaker legal environment than the US. Considering the studies on cross-listing in general, it seems that key stakeholders react differently to the event of cross-delisting than to the event of cross-listing. This gives new insights into the behaviour of key stakeholders and can be used to predict their reactions to future cross-delistings.

The remainder of this study is organised as follows. The next section discusses the literature about cross-(de)listing, information asymmetry, liquidity and the importance of differences in legal environments among countries. Section 3 describes the development of the hypotheses; Section 4 provides a discussion of the research design and the data; Section 5 presents the empirical results and analyses; and Section 6 summarises the conclusions.

2. Literature review

In this literature review, I discuss two different streams of literature and the effect of a country's legal system on both cross-(de)listing and the information environment. First, I review the literature about motivations for and economic consequences of cross-(de)listing. Second, I provide an overview of the literature about the information environment, especially as regards the association between asymmetric information and cross-(de)listing. Finally, I consider the literature regarding differences in the legal environment among countries and the effect of these differences on cross-(de)listing, information asymmetry and liquidity.

2.1 Motivations for and consequences of cross-(de)listing

Cross-listing is a strategic choice by management to list a company's common shares outside of its country of origin (Chemmanur & Fulghieri, 2006). Daugherty and Georgieva (2011) suggest that firms weigh the benefits of cross-listing against such costs as compliance and exchange listing and decide in favour of cross-listing if the benefits exceed the additional

costs. Hence, cross-listing is not beneficial for all foreign firms. Many different reasons exist for managers to cross-list. Witmer (2005) shows that cross-(de)listing can be explained with the awareness, liquidity, bonding, signalling and market timing hypotheses—all of which are explanations based on theories of asymmetric information. The most important explanations for cross-(de)listing used in this study are in line with the bonding and liquidity hypotheses. In addition, this study also uses the awareness and signalling hypotheses as complements to the other two hypotheses.

The bonding hypothesis of Coffee (2002) posits that firms cross-list to subject themselves to higher-quality regulations voluntarily. It is possible, therefore, for firms to escape a weak legal environment and bond themselves to a stronger legal system. Either way, cross-listing is not a costless process. Reese and Weisbach (2002) suggest that cross-listing in the US increases the disclosure and regulatory costs a firm faces. In addition, a firm has additional direct costs when cross-listing on the U.S. stock exchanges. The signalling hypothesis posits that a firm chooses to cross-list to convey its inside information to uninformed outsiders credibly (Witmer, 2005). According to the signalling hypothesis, firms from countries with less strict regulations and poorer disclosure requirements would be more likely to cross-list to overcome the weak legal environment of their home country. Although the bonding and signalling hypotheses have many similarities, the difference is that under the former, the management changes its incentives to expropriate, whereas under the latter, management tries to communicate the amount of expropriation (Witmer, 2005). Coffee shows that many foreign firms choose to cross-list on a U.S. stock exchange because it commits them to respect the minority rights of investors and to provide fuller disclosure than in most other countries. For example, cross-listed firms in the US are subject to far-reaching investor protection laws such as the SOX and the Foreign Corrupt Practices Act (FCPA). According to Lel and Miller (2008), the bonding hypothesis predicts that, *ceteris paribus*, cross-listed firms will have better corporate governance than non-cross-listed firms and that the difference in governance between the two will be greatest in countries with the weakest investor protection. Cross-listed firms in the US are also subject to the law enforcement body known as the SEC, to private investor lawsuits and to increased scrutiny from intermediaries such as financial analysts and debt-rating agencies (Lel & Miller, 2008). Several empirical studies examine the economic consequences of cross-listing in the US and find evidence that is consistent with the bonding hypothesis. This line of research finds that cross-listing enhances firm value through its effect on a firm's information environment (Lang, Lins & Miller, 2003), ensures higher visibility through more scrutiny by financial analysts (Baker et al., 2002) and leads to changes in the

composition of ownership around the time of cross-listing itself because the event attracts more institutional investors. However, some recent studies show that bonding via cross-listing on U.S. exchanges is ineffective. Cross-listed firms are relatively less affected by SEC oversight and U.S. laws compared to other firms in the US (Siegel, 2005). In addition, Lang, Raedy and Wilson (2006) indicate that the accounting data of cross-listed firms are of lower quality compared to those of firms listed in the US only, although they are both subject to the same rules. On the other hand, the differences in disclosure quality between cross-listed and U.S. firms can also be explained by the ability of managers to use a relatively high degree of discretion, due to the US's Generally Accepted Accounting Principles (GAAP) (Leuz, 2006).

In addition to the bonding hypothesis, the liquidity hypothesis is very important in this study and provides another motivation for managers to cross-list. Fanto and Karmel (1999) find through letters and interviews that firms decide to cross-list to increase the liquidity of the firms' shares. Moreover, U.S. exchanges provide various benefits for cross-listed firms, such as cost savings and the possibility to supply large amounts of equity on U.S. capital markets (Fanto & Karmel, 1999). The awareness hypothesis (also called the shareholder base hypothesis) goes well with the liquidity hypothesis and assumes that firms want to cross-list to increase their visibility and shareholder base (Witmer, 2005). Making a firm more visible ensures that shares become accessible for more investors. Cross-listing makes a firm more visible, brings the shares under consideration by a larger investor base and decreases information asymmetry (Witmer, 2005). These are also important factors that influence the liquidity of a firm's shares. Several different empirical studies in line with the liquidity hypothesis also examine the economic consequences of cross-listing in the US. First, Chowdhry and Nanda (1991) show that trading dually listed stocks lowers the bid-ask spread through an increase in competition among the market makers. The lower bid-ask is beneficial in that valuation of the firm increases due to a decrease in information asymmetry. Although enhanced inter-market competition might lower the spread and therefore improve liquidity, multimarket trading might also decrease liquidity by fragmenting order flows among markets (Licht, 2003). Thus, the net effect of liquidity is different for each firm. Second, Errunza and Miller (2000) examine the association between cross-listing in the US and a firm's cost of capital, finding evidence that firms cross-listing on U.S. exchanges lower their cost of capital. Third, Amihud (2002) suggests that a firm has to pay a liquidity risk premium when its shares are relatively illiquid in comparison to shares of other firms. Cross-listing on a foreign capital exchange with a very liquid character offers the possibility for firms to enhance the liquidity of their shares, which is useful in lowering the expected return and reducing the liquidity risk

premium (Baker et al., 2002). It seems that cross-listing is less beneficial for firms that already have high liquid shares and for firms that are listed on a relatively liquid stock exchange.

Until now, many studies have focussed on the motivations managers have to cross-list and on the economic consequences cross-listing entails, as opposed to examining the reasons for and results of cross-delisting. This focus seems logical, given the long-time trend of cross-listing by non-U.S. firms in the US (Karolyi, 2006). The reversal of the trend increased the attention paid to the studies on cross-delistings. You, Parhizgari and Scrivastava (2012) investigate the causes and consequences of cross-delistings for investors in term of price, risk and liquidity. Firms tend to cross-delist in response to low firm trading volume and low return in the host market (You et al., 2012). This pattern shows that firms decide to cross-delist for the simple reason that their expectations about the liquidity of the firm's shares are not realised by cross-listing. The results of the study by You et al. support the liquidity hypothesis. Witmer (2005) has also found support for it, showing that firms are more likely to cross-delist when they have a lower percentage of turnover in the US. On the other hand, Witmer finds mixed support for the bonding hypothesis. Especially striking are the results indicating that firms from countries with poorer investor protection and those in the post-SOX period are more likely to cross-delist, which is contrary to the bonding hypothesis. According to Witmer, these outcomes are more consistent with the avoiding hypothesis, which assumes that firms are less likely to cross-list or more likely to cross-delist when compliance costs and other additional costs of cross-listing are higher due to the larger gap in the regulatory requirements among different countries.

2.2 Association between information asymmetry and cross-(de)listing

As mentioned in the previous section, explanations about cross-(de)listing are mainly based on theories of asymmetric information. Bebczuk (2003) suggests that asymmetric information occurs in a given situation in which one party in a transaction has more or superior information than another. The information (or 'lemons') problem arises from information differences and conflicting incentives between buyers and sellers (Akerlof, 1995). A potential problem with asymmetric information is that the party with superior information can take advantage of a situation in which the other party has less knowledge. This disparity can lead to a non-optimal equilibrium of capital in the market. The principal-agent problem is one of the primary problems of asymmetric information (Witmer, 2005). Agency theory is an important supposition that explains the relationship between the principals and agents in business. Jensen and Meckling (1976) indicate that agency theory is concerned with the separation of ownership

and control in modern corporations. Agency theory focusses on problems such as conflicts of interest that can exist in agency relationships when the desires or goals of the principal and agent are in conflict.

There are different ways to solve information asymmetry between principals and agents or reduce it to an acceptably low level. According to Healy and Palepu (2001), optimal contracts between entrepreneurs and investors can provide incentives for full disclosure of private information, which will help mitigate the misvaluation problem. Another potential solution for the asymmetric information problem is regulation that requires managers to disclose their private information fully (Healy & Palepu, 2001). Finally, Healy and Palepu suggest that information intermediaries such as financial analysts and rating agencies can provide private information obtained through their analyses. All of these solutions for the information asymmetry problem emphasise the importance of communicating inside information about a firm's value to investors credibly.

A number of recent papers have examined the association between cross-(de)listing and the information environment of a firm. Investigating the relationship between cross-listing in the US and the information environment of non-U.S. firms, Lang et al. (2003) find that firms that cross-list on a U.S. stock exchange have greater analyst coverage and increased forecast accuracy than firms not cross-listed. Furthermore, changes in firm value are highly correlated with the change in analyst following and analyst accuracy, suggesting that cross-listing enhances firm value through its effect on a firm's information environment (Lang et al., 2003). Ahearne, Griever and Warnock (2004) also suggest that firms can enhance their information quality through cross-listing on U.S. stock exchanges because regulations in the US are relatively stricter than in most other countries. Conversely, Fernandes, Lel and Miller (2008) examine the consequences of Rule 12h-6, which makes it easier for cross-listed firms to delist from U.S. stock exchanges. The results show that the market reacts negatively to the ability of firms from regimes with weak investor protection and from countries with less stringent disclosure requirements to easily opt out of the US's stringent reporting and legal environment (Fernandes et al., 2008). In contrast, the market reaction is insignificant for firms located in countries with strong investor protection and high disclosure quality. Generally, empirical studies indicate that investors appreciate high information quality and that the information environment of a firm improves after cross-listing because voluntary bonding to a stricter legal system lowers the information asymmetry between managers and outside investors. One should realise, however, that cross-listing is not a costless event. Reese and Weisbach (2002) suggest that cross-listing in the US substantially increases the disclosure and regulatory costs a firm

faces (e.g., firms must conform to the U.S. GAAP and are subject to SEC regulations). It is thus important for firms to weigh the benefits of a better information environment against the direct and indirect costs of cross-listing.

2.3 Importance of differences in the legal environment among countries

As previously mentioned, firms can reduce information asymmetry costs by subjecting themselves voluntarily to higher-quality regulations when cross-listing. Hence, it is possible for firms to escape a weak legal environment and to bind themselves to a stricter legal system. Many factors influence the quality of the legal environment of a country, and each country has its own unique laws, regulations and institutions. An institution that investigates these factors is the World Justice Project (WJP), an independent, multidisciplinary organisation working to advance the Rule of Law around the world. According to the WJP, eight main factors determine the Rule of Law: constraints on government powers, absence of corruption, open government, fundamental rights, order and security, regulatory enforcement, civil justice and criminal justice. All of these factors combined describe the level of the legal environment in a country.

The studies of La Porta et al. (1996, 1997) are some of the first to emphasise the importance of the legal environment, as described by both laws and the quality of their enforcement, for the nature and effectiveness of financial systems around the world. The results of their studies show that differences in investor protections among countries are associated with varying economic consequences (La Porta et al., 1996, 1997). One of them is that countries with poorer investor protection have smaller and narrower capital markets. Additionally, La Porta et al. (2000) describe the legal protection of investors as a potentially useful way of thinking about corporate governance. An important implication of this approach is that leaving financial markets alone is not a good way to encourage investors (La Porta et al., 2000). Countries have to consider whether their legal structure, laws and regulations offer enough investor protection. The bonding and liquidity hypotheses are based on the outcomes of La Porta et al. (1996, 1997, 2000) and assume that differences in legal systems among countries are the main reason for firms to cross-list to realise their objectives. Reese and Weisbach (2002) find support in this for their hypothesis that non-U.S. firms cross-list in the US to increase protection of their minority shareholders; in particular, the increase is larger for cross-listings from countries with weak shareholder protection. Moreover, Chung (2005) examines the association between investor protection and firm liquidity and finds support for the liquidity hypothesis. Because a good investor protection environment lowers information asymmetry costs by reducing the likelihood of trading against informed traders, liquidity

providers incur relatively lower costs and therefore offer narrower bid-ask spreads (Chung, 2005). On the other hand, several empirical studies suggest that bonding to the stricter legal system of the US does not directly enhance the corporate governance of a firm. Siegel (2005) shows that U.S. law enforcement neither deterred nor punished a group of Mexican insiders who collectively took billions of dollars from their firms. He also finds that SEC action against any US-listed foreign firm has been rare and mostly ineffective throughout the history of federal securities laws. In addition, Licht (2003) questions the bonding role of cross-listing and argues that the role has been overstated, with evidence supporting the avoidance hypothesis. According to Licht, the dominant factors inducing firms to cross-list are access to cheaper financing and enhancement of the issuer's visibility. All in all, it seems that laws are important for reducing information asymmetry and influencing economic consequences. It is important to keep in mind, however, that enforcement of these laws by institutions has a significant role in the quality of the legal environment in a country.

3. Hypothesis development

In this section, the study describes the development of several hypotheses based on the literature briefly reviewed in the previous section. When a firm commits to increased levels of disclosure, the potential for information asymmetries to arise between the management of the firm and its shareholders or among buyers and sellers of the firm's shares diminishes (Bailey, Karolyi & Salva, 2005). The differences in legal environments among countries make it possible for firms to choose the desired extent of disclosure quality. Coffee (2002) shows that many foreign firms choose to cross-list on a U.S. stock exchange because it commits them to a stricter legal environment and provides fuller disclosure than in most other countries.[1] According to the bonding hypothesis, firms from countries with the weakest legal environment are particularly likely to cross-list. This tendency indicates that firms have the opportunity to reduce information asymmetry costs by cross-listing. Therefore, the ability to acquire information at a lower cost increases the supply of analysts (Bailey et al., 2005). Additionally, Frankel and Li (2004) provide evidence that an increased analyst following is associated with reduced information asymmetry between managers and investors. Lang et al. (2003) investigate the relationship between cross-listing in the US and the information environment of non-U.S. firms and find that firms cross-listing on a U.S. stock exchange have greater analyst coverage

[1] For example, cross-listed firms in the US are also subject to far-reaching investor protection laws, such as SOX and FCPA.

and increased forecast accuracy than firms that are not cross-listed. On the other hand, Lang et al. (2006) suggest that the accounting data of cross-listed firms are of lower quality compared to those of firms listed in the US only, although they are both subject to the same rules.[2] This disparity indicates that the information quality of cross-listed firms is not at the same level as that of U.S. firms. Moreover, Siegel (2005) shows that cross-listed firms experience relatively less enforcement by the SEC and U.S. law courts than other firms in the US. The question raised is to what extent the bonding hypothesis is still valid. Recently, Witmer (2005) has found that firms from countries with poorer investor protection and firms in the post-SOX period are more likely to cross-delist, which is contrary to the bonding hypothesis. The current debate on the bonding hypothesis and the mixed results from several empirical studies emphasise the need for further research. This study aims to find support for the bonding hypothesis. Based on the theoretical framework, I expect that cross-delisting from U.S. stock markets will increase information asymmetry between a firm and its investors. I also expect that cross-delisting from U.S. stock markets will increase the information asymmetry between a firm and its investors more for cross-listed firms originating from countries with a weaker legal environment than for those from the US. This supposition leads to the following hypothesis:

> H1: Cross-listed firms that cross-delist from U.S. stock exchanges face an increase in information asymmetry. The effect is more pronounced for firms originating from countries with a weaker legal environment than the US'.

The hypothesis above is stated in an alternative form. The corresponding null hypothesis is that information asymmetry does not change by cross-delisting or as a result of the varying legal environment levels of different countries.

According to La Porta et al. (1996, 1997, 2000), the legal environment as described by both legal rules and the quality of their enforcement is very important for the nature and effectiveness of financial systems around the world. For instance, the results of the studies of La Porta et al. (1996, 1997) show that countries with poorer investor protection have smaller and narrower capital markets. Moreover, Chung (2005) examines the association between investor protection and firm liquidity and finds support for the liquidity hypothesis. Higher protection of investors lowers information asymmetry costs, which results in narrower bid-ask spreads. This pattern indicates that the liquidity of firms is also affected by a country's legal

[2] According to Leuz (2006), the differences in disclosure quality between cross-listed firms and U.S. firms can also be explained by the ability of managers to use a relatively high degree of discretion due to the U.S. GAAP.

system. Lesmond (2005) provides evidence congruent with this statement and suggests that liquidity-related transactions are more expensive in countries with a weak legal environment than in countries with a stricter legal system. Cross-listing on a foreign capital exchange with a very liquid character offers the possibility for firms to enhance the liquidity of their shares, which is useful in lowering the expected return and reducing the liquidity risk premium (Baker et al., 2002).[3] Hence, foreign firms often choose to cross-list on U.S. stock exchanges because of the opportunities they provide to raise capital at lower costs (Daugherty & Georgieva, 2011). Furthermore, Daugherty and Georgieva (2011) suggest that the US has the added benefit of a more developed capital market that offers more liquidity, depth and an enhanced shareholder base. On the other hand, Marosi and Massoud (2008) question the competitiveness of the U.S. capital market because of the costs that cross-listing entails for firms due to the passing of the SOX in 2002. The likelihood that a firm chooses to cross-delist increased after the SOX because the additional costs now exceed the benefits of staying cross-listed (Marosi & Massoud, 2008). You et al. (2012) find that cross-delisting reduces the liquidity of firms, and this effect seems persistent over the long run. In general, the literature on cross-listing suggests that it improves the liquidity of firms. Recently, the compliance costs for firms listed in the US have increased, which has led to more firms that cross-delist. Yet scant research has been done on the effects of cross-delisting on liquidity, especially research taking the legal environments of countries into account. This study aims to contribute to the literature about cross-(de)listing and tries to find support for the liquidity hypothesis. On the basis of the theories discussed in this section, I expect that cross-delisting from U.S. stock markets decreases the liquidity of a firm's shares. I also expect that doing so decreases the liquidity of a firm's shares more for cross-listed firms originating from countries with a weaker legal environment than for those from the US. This leads to the following hypothesis:

> H2: Cross-listed firms that cross-delist from U.S. stock exchanges face a decrease in liquidity. The effect is more pronounced for firms originating from countries with a weaker legal environment than the US'.

The hypothesis above is stated in an alternative form. The corresponding null hypothesis is that liquidity does not change by cross-delisting or because of the legal environment levels of different countries.

[3] Granting that a firm has to pay a liquidity risk premium when the shares are relatively illiquid in comparison to the shares of other firms on the markets (Amihud, 2002).

4. Research design

This section describes the empirical methodology of this study, which is used to examine the two hypotheses and to analyse the results. First, this chapter focusses on the theoretical relations (i.e., constructs) to be tested and determines how to operationalise them in this empirical study. Second, the control variables necessary for the empirical models and the reasons why they should be included are defined. Third, the regression models and the links between these models and the hypotheses are provided. Last, the motivation behind the sample and data collection is described.

4.1 Operationalisation of the theoretical relations or constructs

The purpose of this master's thesis is to examine the economic consequences of cross-delisting. More specifically, it sets out to investigate the effect on information asymmetry and liquidity of cross-delisting from U.S. stock exchanges, taking into account the legal environments of countries. The first hypothesis predicts that cross-delisting from U.S. stock exchanges increases information asymmetry between a firm and its investors. The second hypothesis predicts that cross-delisting from U.S. stock exchanges decreases the liquidity of a firm's shares. Additionally, both hypotheses also predict that both effects are more pronounced for firms originating from countries with a weaker legal environment than the US'.

This study used American Depository Receipt (ADR) listings and direct listings from one of the three major U.S. stock exchanges (NYSE, NASDAQ and AMEX) to identify cross-(de)listed firms. Data about firms that cross-(de)list in the US are available on the Center for Research in Security Prices (CRSP) database. It is a relatively simple way to gather information on cross-(de)listing, and almost every study on this topic makes use of ADRs and direct listings. Generally, foreign firms cross-list in the US according to the ADR program, but to a lesser extent, foreign firms (especially Canadian firms) choose to list directly on U.S. stock exchanges without ADRs (Lel & Miller, 2008). According to Vaaler and Schrage (2007), ADRs are the most common means by which foreign firms list their shares on U.S. share markets. An ADR is a certificate entitling the investor to a claim on the firm's domestically listed shares at the value of the ADR in U.S. dollars (Vaaler & Schrage, 2007). Qualified U.S. financial institutions such as banks are the typical custodians of these certificates. These depository banks have an important role at the moment that a cross-listed firm decides to delist from U.S. stock markets. Typically, the depository bank must give the ADR holder 30 days' notice prior to the termination of the ADR program (Witmer, 2005). After the termination date, the depository sells the ordinary shares and gives, usually within a day, a cash distribution in U.S. dollars to

any holder submitting an ADR (Witmer, 2005). The procedures of both cross-listing and cross-delisting from U.S. exchanges are noted in detail by the qualified institutions. Because the information on ADRs and direct listings is precise and detailed, it provides a reliable and relevant representation of cross-(de)listings in the US.

Another important aspect of this study pertains to the differences in legal environments among countries, particularly the differences between the US and the home countries of cross-listed firms that delist from U.S. exchanges. These differences are used to examine their moderating effect on information asymmetry and liquidity. Legal environment is a very abstract and broad concept. As a result, no strong consensus exists among policy makers, researchers and others regarding its definition. This master's thesis defines legal environment as the sum total of laws passed by a government for business operations and the enforcement of regulations by authorities on business activities. The primary problem of empirically investigating the effects of differences in legal environments among countries is that these differences are not directly measureable. In addition, many factors influence the current legal environment in a country. Because of these problems, this study uses indices including various proxies to operationalise legal environment. It follows the methodology of the WGI project headed by Daniel Kaufmann (Kaufmann et al., 2011) and uses several parts of their main index. Updated annually since 1996, the WGI project reports composite indicators of six dimensions of governance in more than 200 countries. These six aggregated governance indicators are based on hundreds of individual underlying variables from dozens of different data sources (Kaufmann, 2011).[4] This extensive work has gained international appreciation and has been used in many diverse studies on governance and legal environment (Dang, Moshirian, Wee & Zhang, 2014; Huang, Elkinawy & Jain, 2013; Vaaler & Schrage, 2007). I use the following three aggregated indicators from the WGI project as a proxy for countries' legal environments: Regulatory Quality, Rule of Law and Control of Corruption. Regulatory Quality captures perceptions of the ability of a government to formulate and implement sound policies and regulations that permit and promote private sector development (Kaufmann et al., 2009). Rule of Law captures perceptions of the extent to which agents have confidence in and abide by the rules of society, in particular the quality of contract enforcement, property rights, the police and the courts and the likelihood of crime and violence (Kaufmann et al., 2009). Regulatory Quality and Rule of Law are directly in line with the definition of legal environment. Because

[4] Kaufmann et al. (2011) make use of a large number of individual sources (like the WJP) that reflect the views on governance of thousands of survey respondents and public, private and non-governmental organisation sector experts worldwide.

both of these indices are used similarly in other studies, as has been mentioned,[5] I assume that it is reasonable to use both indicators to measure the level of legal environment. In addition, I also include Control of Corruption as a proxy for legal environment in this study. Control of Corruption captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption as well as 'capture' of the state by elites and private interests (Kaufmann et al., 2009). It is rational to assume, *ceteris paribus*, that the legal environment of a country is of a higher quality when the extent of corruption is lower. Lambsdorff (2007) suggests that a higher level of corruption indicates that the quality of laws, regulations and/or enforcement by authorities is inferior. Poor regulations create incentives for policy makers, bureaucrats and the general public to behave corruptly (Lambsdorff, 2007). These sources indicate that a weak legal environment is associated with corruption. Therefore, I included three aggregated indicators of legal environment (Regulatory Quality, Rule of Law and Control of Corruption) to operationalise this study. All of them are consistent with the previously mentioned theoretical framework.

Information asymmetry is measured using analyst coverage and the bid-ask spread. Analyst coverage indicates the number of analysts who collect and evaluate information from public and private sources to make forecasts about the future prospects of a specific firm they follow. On the basis of these forecasts, analysts publish their opinions on topics such as a firm's financial statements or its stocks. Healy and Palepu (2001) point to a demand for information intermediaries such as financial analysts and rating agencies because of the 'lemons' problem. Financial analysts engage in private information production to uncover managers' superior information (Healy & Palepu, 2001). As a result, they reduce information asymmetry between managers and potential investors in a company. Like Chang, Dasgupta and Hilary (2006), I use the number of analysts covering a firm as a proxy for information asymmetry between managers and outside investors. The needed data on analyst following can be derived from recommendations by analysts from the Institutional Brokers' Estimate System (I/B/E/S) database. More specifically, I use the natural logarithm of the number of estimates made by analysts in the month that is nearest to the date a firm announces its actual earnings per share (EPS). According to Chang et al. (2006), existing empirical evidence strongly suggests that analyst following is negatively correlated with information asymmetry, either because analysts reduce information asymmetry or because they extend coverage to more transparent firms.

[5] For example, Vaaler and Schrage (2007) examine the effects of legal systems and rule of law on U.S. listings by emerging-market firms.

Transparent firms disclose more information, which makes it less costly for analysts to obtain data and to provide their opinions to investors. Firms listed on U.S. exchanges, including cross-listed firms, are subjected to strict regulations, are tightly enforced by authorities and must comply with the stringent disclosure requirements in the US. Accordingly, Lang et al. (2003) show that non-U.S. firms cross-listed on U.S. exchanges have greater analyst coverage and increased forecast accuracy relative to other non-U.S. firms. On the other hand, it should be noted that the association between analyst following and information asymmetry can also be reversed. Consistent with this statement, Kim and Verrecchia (2001) indicate that informed trading is costlier in cases in which the firm commits to a broader disclosure policy. Because obtaining private information is less profitable after an increase in disclosure, the added reporting and disclosure required by regulators for cross-listed firms can crowd out or substitute for the collection of private information (Fernandes & Ferreira, 2008). Under such circumstances, the number of analysts can be lower, given that the level of information asymmetry is low. Either way, I operationalise information asymmetry by means of analyst following because I assume a negative association between them.

As an alternative to analyst coverage, I also include the bid-ask spread as a proxy for information asymmetry. The bid-ask spread is the difference between the ask price and the bid price quoted by the dealer at a given point in time (Stoll, 1989). In particular, it is the difference between the lowest value a prospective seller is willing to accept for a particular security and the highest price a prospective buyer is willing to pay for a security at a particular price. Because this difference changes continuously via market forces, it is useful to include the median bid-ask spread in investigations. This approach is often used in empirical studies in order to measure information asymmetry. In fact, the bid-ask spread addresses the adverse selection problem that arises from transacting in firm shares in the presence of informed investors (Leuz & Verrecchia, 2000). Less information asymmetry implies less adverse selection, which in turns means a smaller bid-ask spread. The bonding hypothesis seems ideal for connecting the bid-ask spread with cross-(de)listing or simple multimarket trading. For instance, Mayhew (2002) shows that options listed on multiple exchanges have narrower bid-ask spreads than those listed on a single exchange. In this study, I follow the methodology of Leuz and Verracchia (2000) to measure information asymmetry, coupling it with cross-(de)listing. Likewise, I use the average relative spread, which means dividing the absolute spread by the midpoint between the bid and ask prices. Datastream provides the needed data on bid and ask prices. Equation 1 shows the formula used in this study, which is derived from Erkens (2016) to calculate the yearly average relative bid-ask spread for each firm separately.

The *i* indicates the yearly median value of the closed BID and ASK prices for a firm. As indicated by Equation 1, I first calculate the spread for each firm using the median values. Thereafter, I scale the spread by the midpoint between the bid and ask prices to obtain the average relative bid-ask spread.

$$\boldsymbol{Average\ relative\ bid\ ask\ spread} = \frac{\boldsymbol{ASK_i - BID_i}}{\left(\frac{\boldsymbol{ASK_i + BID_i}}{\boldsymbol{2}}\right)} \qquad (\mathbf{1})$$

In addition to the two proxies used to operationalise information asymmetry, I also include a proxy in this study to measure liquidity. Share turnover is defined as share volume divided by total shares listed on the exchange (Jones, 2002). Alternatively, this ratio can be calculated using the numerator and denominator expressed in dollars. Equation 2 shows the formula I use to calculate the turnover ratio: dividing a firm's annual trading volume by its number of shares outstanding at year's end. The needed data are available on Worldscope and Datastream. The ratio is higher, *ceteris paribus*, when the amount of trading volume increases or when the number of shares outstanding at year's end decreases. A higher ratio indicates that it is easier for investors to sell their shares on the markets. The ratio shows how active the market is for the shares of a specific firm. Share turnover is a variable often used in empirical studies as the dependent variable for measuring liquidity. For example, Berkman and Nguyen (2010) examine the effect of cross-listing in the US on liquidity using the turnover ratio as a proxy for liquidity. Similarly, I use the same proxy but in association with cross-delisting. According to Brändl (2010), a primary advantage of share turnover is that it is easy to obtain, which enables one to observe liquidity effects over long periods of time and across a large number of stocks.

$$\boldsymbol{Share\ turnover\ ratio} = \frac{\boldsymbol{Yearly\ trading\ volume}}{\boldsymbol{Number\ of\ shares\ outstanding\ year\ end}} * \mathbf{100} \qquad (\mathbf{2})$$

4.2 Control variables

In addition to the main variables explained in the previous section, I also include control variables in this study to clarify the association between cross-(de)listing, information asymmetry and liquidity, taking into account the legal environments of countries. These controls were designed to capture variance in information asymmetry and liquidity linked to the dependent variables and related to factors other than cross-(de)listing and legal environment.

4.2.1 Control variables for analyst coverage

First, I focus on the control variables necessary in the empirical model to control for analyst coverage. As stated, I take the natural logarithm of the number of analysts as a proxy for information asymmetry. I use parts of the methodologies of several studies to find a specific mix of control variables for analyst following. I include firm size, closely held shares, trading volume, growth and volatility.

Bhushan (1989) shows the major determinants of the number of analysts following a firm. As in his study, I include a natural logarithm of the market value of equity (firm size) and the percentage of a firm's shares held by insiders (closely held shares) as control variables. According to Bhushan, an investor is likely to find a piece of information about a larger firm more valuable than the same piece of information about a smaller firm. The reason for this is that an investor can earn a higher profit from the former. Thus, the aggregated demand for analyst services increases for larger firms. This scenario creates a positive relationship between the total amount of information acquisition and firm size. Moreover, analysts also have incentives to focus on larger firms because they are more widely held and stimulate the interest of a large number of investors via more potential transactions (Bhushan, 1989). Larger firms lead to more business transactions for analysts, which lowers the costs of providing information to investors. As a consequence, the aggregated supply of analysts shifts outward.

Another control variable I include for analyst following is closely held shares. Bhushan (1989) suggests that a larger percentage of insider holdings corresponds to lower holdings by non-insiders. Assuming that insiders need fewer analyst services because of their position, the demand for such services decreases when a larger part of the shares is held by insiders. Additionally, it is also possible that an increase in insider holdings may increase the cost of providing analyst services and result in an inward shift in aggregate supply (Bhushan, 1989). For example, higher secrecy as a result of insider holdings can increase analysts' costs of obtaining information, leading to a negative association between analyst coverage and insider holdings. As a result, I expect a negative association between analyst following and insider holdings.

As demonstrated by Alford and Berger (1999), trading volume is highly associated with analyst following, because high trading volume is more profitable for analysts due to higher brokerage commissions. Barth, Kasznik, and McNichols (2001) find evidence for this statement, arguing that brokerage houses' trading commissions are based on trading volume and that analysts are likely to be compensated indirectly for covering stocks that generate trades. As a result, the number of analysts is positively associated with trading volume. For this

reason, I include a natural logarithm of trading volume as a control variable.

I also use growth as a control variable because Barth et al. (2001) find support for the association between growth and analyst following. Market-to-book (MTB) ratio is a widely accepted manner of measuring growth. Firms with a high MTB ratio have better prospects in general than firms with a lower MTB ratio and are more attractive for investors. These prospects can lead to an increase in analyst services for growth companies. Hence, the association between growth and analyst coverage seems to point in a positive direction.

Finally, the natural logarithm of return volatility is included in this thesis to control for analyst coverage. O'Brien and Bhushan (1990) show that analyst following increases more in firms whose return volatility has declined. Analysts tend to avoid volatility because of the difficulty in predicting future financial results accurately. Less accurate information provided by analysts is less useful for investors in making decisions. Lower demand for analysts' services means that there is room for fewer analysts. Like O'Brien and Bhushan, I use the standard error of stock returns as a proxy for volatility. To sum up, I assume on the basis of prior literature that the association between volatility and analyst coverage is negative.

4.2.2 Control variables for bid-ask spread

Second, my model requires variables to control for bid-ask spread. Leuz and Verracchia (2000) examine the determinants of bid-ask spread and find significant results. Accordingly, I include firm size, volume, volatility and free float as control variables. The first control variable in my model is the natural logarithm of firm size, a proxy often used to measure the public information available about a firm's stock. Leuz and Verracchia find that firm size controls at least partially for a firm's information environment. As previously stated, firm size can be measured by the market valuation of a firm's equity. According to Harris (1994), if the stock is well known, information asymmetry and the adverse selection component of the total spread should be small. Because well-known firms are regularly those with the highest market value, their bid-ask spread is lower because the information asymmetry between managers and investors is also lower. On the basis of the studies by Leuz and Verracchia and Harris, it seems that the association between firm size and bid-ask spread is negative.

Another control variable I take into account is the natural logarithm of volume. Leuz and Verracchia (2000) find a significant effect of average daily turnover on the bid-ask spread. In almost the same manner, I measure volume by means of the trading volume of a firm's shares. Harris (1994) indicates that it is justified to measure trading activity (i.e., volume) in the manner I use. Spreads are expected to decrease with trading activity because the fixed costs

of market-making are spread over more traders (Harris, 1994). Consequently, firms with high trading volume have narrower bid-ask spreads than firms with infrequently traded shares. The reason for this is that a broker puts more effort into converting an illiquid share into cash and requires a higher compensation from investors for handling the transaction. This higher compensation implies a wider bid-ask spread. Because of the difficulty that brokers have selling illiquid shares they require higher transaction costs from investors, which results in a wider bid-ask spread.

I also include the natural logarithm of volatility as a control variable in the model. Similar to the approach of Leuz and Verracchia (2000), I measure it using the standard deviation of stock return. According to Harris (1994), spreads are expected to increase with volatility. Volatility is probably correlated with information asymmetry because dealers must recover from uninformed traders what they lose to informed traders. Volatility usually peaks during periods of extreme market conditions, such as a sharp market decline or an unusual increase. At times when the volatility increases, the bid-ask spread becomes wider because the market makers want to take advantage of the change (e.g., investors are willing to pay higher prices for shares increasing in value, which in turn leads to higher premiums for market makers). On the other hand, the bid-ask spread is narrow when volatility is low and there is less uncertainty in the markets.

Finally, another important aspect that affects the bid-ask spread is free float. I include free float of shares, which is defined as the total shares outstanding excluding shares held by strategic investors such as governments, corporations, controlling shareholders and management and board members (Chan, Chan & Fong, 2004). In short, free float is the portion of listed share capital freely traded on the market. As in Saffi and Sigurdsson (2010), I calculate free float as 1 minus the percentage of ‘strategic holdings’ (also called ‘closely held shares’) that are not regularly traded in markets. The data on strategic holdings are available via Worldscope. Equation 3 shows the formula for free float, which is derived from the formula of Erkens (2016) for closely held shares. Leuz and Verracchia (2000) use a firm’s free float as an inverse proxy for the presence of insiders because shareholders with large and closely held stakes generally have superior access to information about a firm. Investors with this superior information take advantage of their knowledge and use it on the markets. As mentioned, a low free float indicates that the information gap between insiders and outsiders is also wider. In general, a higher free float indicates a narrower bid-ask spread because the information asymmetry is lower between insiders and outsiders.

$$\boldsymbol{Free\ Float\ Percentage} = \mathbf{100} - \left(\frac{\boldsymbol{Number\ of\ closely\ held\ shares}}{\boldsymbol{Common\ shares\ outstanding}} * \mathbf{100}\right) \qquad (\mathbf{3})$$

4.2.3 Control variables for share turnover

Third, I include variables in my model to control for share turnover. In general, I followe the methodology of Chordia, Huh and Subrahmanyam (2007). Theirs is the first study to comprehensively examine the cross-sectional determinants of trading activity, and they focus primarily on the association between visibility and liquidity. Accordingly, I include the following as control variables: firm size, growth, analyst following, firm leverage and volatility.

The first control variable is the natural logarithm of firm size, which can be expressed as total assets or market capitalisation. I choose to operationalise firm size by means of market capitalisation. Chordia et al. (2007) find a significant effect of firm size on share turnover, because bigger firms are more visible for investors. As mentioned in the literature review, visibility leads to more liquid shares. I assume that firm size affects the turnover ratio and expected the association to be positive.

Next, growth is included as a control variable, which is measured using MTB values. Firms with the potential to grow have a high MTB value and are automatically more visible for investors due to the attention they get. Visibility plays an important role in the level of liquidity. Although Chordia et al. (2007) find mixed results for this variable, I include it to prevent an omitted variable in the regression model. On the basis of the theory of visibility, I expect that a firm with a high MTB value also has a higher turnover ratio.

Also included is the analyst following variable, which is a proxy for information asymmetry. The association between information asymmetry and analyst coverage is discussed extensively in section 4.1, where it is indicated that the correlation between the two can be positive or negative. Either way, I assume that the association between analyst following and information asymmetry is negative. Analysts provide private information to investors, which reduces the information gap between managers and the public. As a result, trading activity increases because the likelihood of losing money to insiders decreases. This implies that an improved information environment leads to more liquidity in markets. The data on analyst following can be derived from the number of analysts who follow a firm and report to the I/B/E/S database (Chordia et al., 2007). Altogether, I expect analyst following to be positive.

Another control variable is firm leverage, which is the debt-to-asset ratio. A firm with excessive debt is considered riskier to investors than a predominantly equity-financed firm because of a high probability of financial distress and default (Chordia et al., 2007). In addition, agency arguments suggest that managers take higher risks with borrowed money than with money from equity. Consequently, higher leverage could influence trading activity on markets because, in general, people dislike risk. On the other hand, it should be noted that a higher level of leverage can also increase trading activity as a result of short-selling and buying. In any case, in line with the study of Chordia et al. (2007), I expect that firms with higher leverage will have, *ceteris paribus*, a lower share turnover ratio. The ratio is obtained by dividing total debt by total assets and is provided by Worldscope.

I also decided to include the natural logarithm of volatility as a control variable for share turnover. Volatility is measured using the standard deviation of stock returns. This approach is also used by Berkman and Nguyen (2010), who use volatility as an explanatory variable with the turnover ratio as a dependent variable. As with leverage, higher volatility causes uncertainty about the profits that investors can earn. Higher uncertainty results in higher risk for investors. As a result, trading activity can be influenced by volatility in two ways. First, investors can choose to trade less on these shares because of the higher risk. Second, uncertainty about a firm's stock return means that investors will have varying opinions about its future, which can increase the share turnover ratio. Although I realise that the association between volatility and share turnover can be positive, I assume that the sign of volatility is negative.

4.3 Regression model

This section covers the regression models tested in this master's thesis using ordinary least squares and provides the links between these models and the hypotheses. The event of interest ($t = 0$) for this empirical study is the date that foreign firms cross-delist from the stock markets in the US. An analysis of the effects of this event requires data from two years before the event ($-2 \leq t \leq 0$) to two years after it ($0 < t \leq 2$) for every firm included in the samples. This study used the *difference-in-differences* method, which is a statistical technique for examining whether the effect of 'X' (cross-delisting) on 'Y' (information asymmetry/liquidity) is stronger or weaker for different groups of observations. It is a method often used in empirical studies on cross-(de)listing. A major advantage of difference-in-differences is that it provides researchers a more reliable way to control for contemporaneous events (Litvak, 2007). This statistical approach makes it possible for this study to examine whether the effect of cross-delisting from U.S. stock markets is more pronounced for firms originating from countries with

a weaker legal environment than the US' as opposed to a stronger one. Multivariate analyses based on the regression equation below using company-year observations provides a basis for hypothesis testing. The *i* indicates the company and the *t* indicates the year.

$$\boldsymbol{ECOCON_{i,t} = \alpha_0 + \beta_1 CRDELIST + \beta_2 POST + \beta_3 LEGENV + \beta_4 CRDELIST * POST + \beta_5 LEGENV * POST + \beta_6 CRDELIST * LEGENV + \beta_7 CRDELIST * POST * LEGENV + \beta_8 CONTROL_{1i,t} + \cdots + \varepsilon_{i,t}} \quad (4)$$

Equation 4 shows the dependent variables ('Y') used in this study to measure the economic consequences (ECOCON) of cross-delisting. Two variables are used as a proxy for information asymmetry and one for liquidity. In the regression model, I subsume these variables under ECOCON. First, the variable Log(ANACOV) indicates the natural logarithm of the total number of analysts that follow a specific firm. This variable measures information asymmetry between managers and investors. A higher number of analysts following the firm indicates lower information asymmetry. Second, RBDSK shows the relative spread of the bid and ask prices on the market. This variable is also used to measure information asymmetry. A higher spread indicates higher information asymmetry. Third, STURN is the share turnover ratio of a specific firm. This variable measures liquidity, and a higher turnover indicates that a firm's shares are more liquid.

It is straightforward to measure cross-delisting ('X') using a dummy variable, which equals 1 for cross-listed firms that cross-delist from U.S. exchanges and 0 otherwise (CRDELIST). The firms that cross-delist are deemed the *treatment group.* The *control group* consists of firms that have substantially the same properties as those in the treatment group but stay cross-listed on one of the three major exchanges in the US. As in Berkman and Nguyen (2010), the most important criterion I use in this study is the country of origin of cross-delisted firms. This means that I try to include firms in the control group based on the country of origin of those in the treatment group to match both groups with each other. For example, when a Dutch firm cross-delist from a U.S. exchange, I try to include a Dutch firm that stay cross-listed on one of the three U.S. exchanges in my control group. It is important that the control group matches the treatment group because otherwise the likelihood of biased results is higher. Another independent variable included in all three models is POST. This is also a dummy variable, where 1 is the period after the event cross-delisting ($0 < t \leq 2$), 0 is the period before cross-delisting ($-2 \leq t \leq 0$), and *t* is given in years. This scenario implies that when POST is 1, it includes the data two years after the event but excludes the data of the event itself. On the other hand, if POST is 0, it includes the data from two years before the event up to and including

the event. This dummy is important for measuring the differences in information asymmetry and liquidity in firms both before and after the event of cross-delisting. As previously mentioned, the firms in the control group stay cross-listed during the whole test period (2002-2014) and are matched with the cross-delisting firms in the treatment group. Therefore, the POST variable is also matched, which means that if a firm cross-delisted in 2006, the POST variable is equal to 1 for the two years after 2006 and equal to 0 from 2004 up to and including 2006 for both the cross-delisting firm and the matched firm that stay cross-listed during the whole test period. This is in line with the method of Chaplinsky and Ramchand (2008), which assigns cross-listed firms to the same delisting date (year) as their paired cross-delisted firms to match them with each other as described above. Measuring legal environment (LEGENV) is done using three different indicators and an average index (AVEINX) composed of these indicators. As previously mentioned, I use three indicators by Kaufmann et al. (2009, 2011): Regulatory Quality (REGQ), Rule of Law (RULELAW) and Control of Corruption (CONCORP). The units in which legal environment is measured follow a normal distribution, with a mean of 0 and a standard deviation of 1 in each period (Kaufmann et al., 2009). In fact, all scores lie virtually between –2.5 and 2.5, with higher scores corresponding to better outcomes. Because this study focussed mainly on the economic consequences of cross-delisting from U.S. exchanges with the levels of legal environment of countries as the moderating effect, I take the differences in index scores between the US and the home countries of cross-delisted firms. Subsequently, I divide the countries based on these numbers into two groups (strong and weak) that are compared to the US for each indicator. I classify a country as strong for an indicator if the difference in scores is higher than 0 ($s > 0$) and as weak if the difference in scores is equal to or lower than 0 ($s \leq 0$) at event t-1, where *s* was the difference in index scores between the US and another country.[6] For example, I classify Norway as strong compared to the US if Norway has a score of 2 and the US a score of 1, because the difference is 1 which meant that $s > 0$. I assume that the decisions of firms to cross-delist are based on circumstances one year before the event of cross-delisting, because making a decision to cross-delist requires many time-consuming calculations and discussions. Therefore, I choose to classify countries into two groups based on *s* scores one year before the event of cross-delisting in order to take the legal environment into account at the moment the decision is made to cross-

[6] As mentioned in the literature section, foreign firms often choose to cross-list in the US because of the high quality of its legal system. On this basis, it is possible to classify a country's Rule of Law, for example, as strong or weak by comparing its index score with that of the US.

delist. In this way, each country is classified as a country with a strong or weak Regulatory Quality, Rule of Law and Control of Corruption compared to the US. It also means that the variables REGQ, RULELAW, CONCORP and AVEINX are dummies in the regression model, where 1 signifies that a country is marked as weak for a specific indicator and 0 signifies otherwise. To simplify for clarity, I call all of these variables LEGENV in Equation 4.

The most important coefficients of the regression model are $\boldsymbol{\beta_4}$ and $\boldsymbol{\beta_7}$, which show the effects of the variables of interest (CRDELIST*POST and CRDELIST*POST*LEGENV) on the dependent variables for this study. The coefficient $\boldsymbol{\beta_4}$ helps test the first part of both hypotheses. The first part of Hypothesis 1 expect that cross-delisting from U.S. stock exchanges increases the information asymmetry between a firm and its investors. This supposition is tested by the regression model, which examines the effect of cross-delisting ($\boldsymbol{\beta_4}$) on analyst following and the relative bid-ask spread. Accordingly, Hypothesis 1 predicts a negative coefficient $\boldsymbol{\beta_4}$ on analyst following and a positive coefficient $\boldsymbol{\beta_4}$ on the relative bid-ask spread. Furthermore, the first part of Hypothesis 2 expect that cross-delisting from U.S. stock exchanges decreases the liquidity of a firm's shares. This paradigm is also tested by using the same interaction, but this time it examines the effect of cross-delisting on share turnover. Consequently, Hypothesis 2 predicts a negative coefficient $\boldsymbol{\beta_4}$ on share turnover.

The coefficient $\boldsymbol{\beta_7}$ helps test the last part of both hypotheses of this study. The last part of Hypothesis 1 expects that the effect of cross-delisting from U.S. stock exchanges on information asymmetry is more pronounced for firms originating from countries with a weaker legal environment than the US'. This theory is tested by examining the moderating effects of Rule of Law, Regulatory Quality, Control of Corruption and an average of these indicators on the association between cross-delisting and analyst following/relative bid-ask spread. In Equation 4, the moderating effect is represented by coefficient $\boldsymbol{\beta_7}$. Accordingly, Hypothesis 1 predict a negative coefficient $\boldsymbol{\beta_7}$ on analyst following and a positive coefficient $\boldsymbol{\beta_7}$ on the relative bid-ask spread. In other words, it predicts an additional (or stronger) effect of cross-delisting based on the level of legal environment in a firm's home country. The last part of Hypothesis 2 expects that the effect on liquidity of cross-delisting from U.S. stock exchanges is more pronounced for firms originating from countries with a weaker legal environment than the US'. This theory is tested using the same moderating variables; however, share turnover is used here as the dependent variable and as a proxy for liquidity. The moderating effect on share turnover is also represented by coefficient $\boldsymbol{\beta_7}$ in the regression model. Consequently, Hypothesis 2 predicts a negative coefficient $\boldsymbol{\beta_7}$ on share turnover. In short, coefficient $\boldsymbol{\beta_7}$ is crucial in this study because it indicates the additional economic consequences caused by cross-

delisting in combination with a country's level of legal environment.

The other independent variables are included in the model as control variables. In Equation 4, I call all of these control variables CONTROL to keep the regression model clear. I include firm size (Log[SIZE]), closely held shares (CLOSE), trading volume (Log[VOLUME]), growth (GROWTH) and volatility (Log[VOLATILITY]) to control for analyst following. As previously stated (see section 4.2.1), I expect the variables Log(SIZE), Log(VOLUME) and GROWTH to be positively associated with Log(ANACOV) on the basis of prior studies. On the other hand, the prediction is that the variables CLOSE and Log(VOLATILITY) would be negatively signed. In addition, I include firm size (Log[SIZE]), trading volume (Log[VOLUME]), volatility (Log[VOLATILITY]) and free float (FFLOAT) as controls for the relative bid-ask spread. The only variable I expect to be positively associated with RBDSK is Log(VOLATILITY). The other control variables (Log[SIZE], Log[VOLUME] and FFLOAT) are expected to be negatively signed (the reasoning behind these expectations is explained in section 4.2.2). Last, the variables firm size (Log[SIZE]), growth (GROWTH), analyst coverage (Log[ANACOV]), leverage (LEVERAGE) and volatility (Log[VOLATILITY]) are included to control for share turnover. On the basis of section 4.2.3, the expectation is that Log(SIZE) and Log(ANACOV) would be positively signed, as opposed to GROWTH, LEVERAGE and Log(VOLATILITY). See Table 1 in the Appendix for an extensive overview of the different variables.

4.4 Sample and data

This master's thesis attempts to answer the research questions by examining two different samples. The first is a sample of cross-listed foreign firms that have chosen to cross-delist from one of the three major U.S. exchanges (NYSE, NASDAQ and AMEX). The second sample consists of foreign firms that stay cross-listed on one of the same three exchanges in the US. The sample period in this study is from 2004 to 2012 because the SOX of 2002 set new or expanded requirements for all US-listed companies. Several studies have already examined the effects of the SOX on cross-(de)listing and found significant results. For instance, Zhu and Small (2007) show that the number of new cross-listings significantly declined and that the number of cross-delistings increased in the US after the SOX. As with other changes in requirements, the main effect is often strongest in the first few years. Based on this, I assume that two years after the SOX implementation provides a better basis for starting the sample period than directly after the implementation of the SOX. Further, I decide that the sample will run up to and including 2012 because I also need data for two years after the sample period to

perform the regression model. All in all, the chosen sample period seems the most appropriate to examine the research question because it takes the SOX into account, uses the most relevant data and is also wide enough.

To develop the first sample, which contains the cross-delisting firms, I follow the studies of Witmer (2005) and Chaplinsky and Ramchand (2008). First, I identify all firms in the CRSP database that has delisted from one of the three major U.S. stock exchanges by selecting firms with a delisting code regardless of their reasons for delisting. During the sample period, 4,349 firms decide to delist from the U.S. stock exchanges. Next, the delisted firms are filtered based on their CRSP share code to identify foreign delisted firms. These include issues with the share codes 30 or 31 (ADRs) and issues with a share code of 12, which indicates the ordinary shares of companies that are incorporated outside the US. This implies that the sample includes Level II and III ADRs and direct listings but does not include Level 1 and Rule 144A ADRs because those are not listed on a U.S. stock exchange (Chaplinsky & Ramchand, 2008)[7]. After applying these share codes, the sample is reduced to 553. Subsequently, firms that are delisted due to a merger, acquisition or share exchange or transferred to another exchange are removed based on delisting code using the CRSP database. Following Witmer (2005), stocks with delisting codes below 500 are removed, as are stocks with delisting codes 501, 502, 503, 505, 510, 513, 516 and 517, as these stocks are moved to another U.S. exchange. Moreover, stocks with delisting codes of 572, 574 and 575 are removed, as these stocks went bankrupt. Consequently, the sample drops to 296 firms. Furthermore, to ensure that the sample is affected as little as possible by noise, I check all of the 296 firms by hand. Among the 296 firms, there are still many firms that are delisted due to a merger, acquisition or liquidation or are simply inactive during the sample period. In addition, the drop in firms is also largely caused by missing data or 'Stock Exchange Daily Official List' (SEDOL) codes on Worldscope. After applying these screens, the remaining sample is left with 136 firms. Table 2 in the Appendix shows the complete sample selection procedure of cross-delisted firms. In fact, the cross-delisting sample can be divided into voluntary and involuntary cross-delistings. Firms that

[7] *Level 1* ADR programs establish a trading presence but may not be used to raise capital. It is the only type of facility that may be unsponsored and, as a result, may be traded only on the over-the-counter market. Form F-6 would be the only form required to be filed.
Level 2 ADR programs establish a trading presence on a national securities exchange but may not be used to raise capital. Besides Form F-6, the non-U.S. company is required to register and file annual reports on Form 20-F with the SEC.
Level 3 programs may be used not only to establish a trading presence, but also to raise capital for the foreign issuer. A registration statement on Form F-1, Form F-3 or Form F-4 would be filed in order to offer the ADRs. The non-U.S. company would be required to also file annual reports on Form 20-F.
Retrieved from: https://www.sec.gov/investor/alerts/adr-bulletin.pdf

delist at the request of the firm and not at the behest of the exchange-of-market regulators are classified as voluntary delistings (Chaplinsky & Ramchand, 2008). This classification ensures a better understanding of the reasons behind cross-delisting. Following the study of Chaplinsky and Ramchand, CRSP delisting codes ≥ 400, excluding 570 and 573, indicate involuntary delistings, and CRSP delisting code 570 indicates voluntary delistings.[8] After applying these codes, my cross-delisting sample consists of 99 involuntary cross-delistings and 37 voluntary cross-delistings.

Thereafter, the cross-delisting sample is also divided based on the firms' originating countries. I use the SEDOL codes in combination with the item 'CountryCode' in Worldscope via the Thomson One Banker Add-in to identify the firms' home countries. Table 3 presents various panels describing the distribution of the cross-listing and cross-delisting samples. Panel A of Table 3 shows the number of involuntary and voluntary delistings and the total cross-delistings per country. The number of involuntary delistings is significantly higher than the number of voluntary delistings. This means that, in general, the reason behind the decision to cross-delist is not made at the company's request. The greatest number of involuntary cross-delistings come from Canada, which also has the greatest number of cross-delistings. Panel B of Table 3 shows the number of voluntary and involuntary cross-delistings over time. As previously stated, directly after the determination date, the depository sells the ordinary shares and gives a cash distribution in U.S. dollars to any holder of an ADR. Similarly, a shareholder of a directly listed firm receives the value of the shares in U.S. dollars within a trading day after the determination date. Therefore, I use the variable 'Date of Delisting Payment' via CRSP to identify the year a firm is cross-delisted. This variable provides information about the date that any return payments are made as a result of delisting. The number of total cross-delistings increases until the year 2007 and peaks in that same year. The peak is mainly due to the high number of involuntary cross-delistings. After 2007, there is a reverse trend where the number of cross-delisting decreases.

To develop the second sample, which includes the cross-listing sample, I follow Berkman and Nguyen (2010). The most important criterion I use in this study to match the control sample with the treatment sample is the country of origin of cross-delisted firms. As previously mentioned, this means that I try to include firms in the control group based on the country of origin of those in the treatment group to match the two groups with each other. I use

[8] Delisting code 570: Delisted by current exchange - company request (no reason given).
Delisting code 573: Delisted by current exchange - company request, deregistration (gone private).
Retrieved from: http://www.crsp.com/products/documentation/delisting-codes

the variable 'Foreign Incorporation Code' (FIC) through the database Compustat – North America, which indicates the country in which a company is incorporated, which helps obtain information about a cross-listed firm's home country. Furthermore, it is important that all the firms in the control sample staye cross-listed during the sample period to prevent biased conclusions based on the results. I check this using the variable 'Fiscal Year End' via Compustat – North America, which shows that a firm is cross-listed during the sample period if data are available during this time. In addition, I also verify each firm using Yahoo Finance and Google Finance before I include it in the control sample. Then, I try to find the SEDOL codes using Worldscope. After these screens, I have a control sample with cross-listed firms. Panel C of Table 3 shows the number of cross-listings and cross-delistings per country included in the two samples of this study. Moreover, it provides average index scores over the test period 2002-2014 for the variables REGQ, RULELAW, CONCORP and AVEINX per country. For 94 of the 136 cross-delisted firms, I find a cross-listed firm from the same home country. For the remaining 42 firms, I try to identify cross-listed firms based on countries' regions and index scores. For example, I include a Belgian firm in my control group that stays cross-listed on one of the three major U.S. exchanges as a match for a French firm that cross-delist from the same exchanges. The control group chiefly consists of cross-listed firms from Canada (42) and the United Kingdom (23), which in fact compensates for firms originating from other countries like Germany and the Netherlands. Generally, the average index scores in the last row of the table show that the cross-delisted firms are from countries with significantly high levels of legal environment, with Denmark having the highest average score (2.06) and Russia the lowest (-0.69).

All of the data necessary to construct the independent variables which operationalised legal environment are obtainable on the website of the World Bank Group (WBG).[9] As previously stated, the WGI project has reported composite indicators of six dimensions of governance on more than 200 countries since 1996 and is updated annually. These six aggregated governance indicators are based on hundreds of individual underlying variables from dozens of different data sources (Kaufmann et al., 2011). An advantage of this approach is that the margins of error decline. In the WGI project, Kaufmann et al. (2011) rely exclusively on perceptions-based governance data sources, including surveys of firms and households and the subjective assessments of a variety of commercial business information providers, non-governmental organisations and a number of multilateral organisations and other public-sector

[9] http://info.worldbank.org/governance/wgi/index.aspx#home

bodies.[10] The main reason behind this methodology is that perceptions matter because agents base their actions on their perceptions. Furthermore, there are few alternatives to relying on perception data regarding legal environment. Finally, Kaufmann et al. (2009, 2011) note that even when objective or fact-based data are available, such data may often capture the *de jure* notion of laws 'on the books', which often differs substantially from the *de facto* reality that exists 'on the ground'. Since all of the sources use reasonably comparable methodologies over time, the data from the individual indicators can usefully be compared both across countries within a given time and over time for individual countries (Kaufmann et al., 2011). This study uses data from the WGI project headed by Daniel Kaufmann as the main source for legal environments. The WGI project provides data for the variables REGQ, RULELAW and CONCORP from several parts of the main index. In addition, I create my own index by taking an average of the three indicators and call it AVEINX.

The data required for analyst following (Log[ANACOV]) can be derived from recommendations by analysts in the I/B/E/S database. Consistent with prior research, I follow the methodology of Barth et al. (2001) and use the natural logarithm of the number of estimates made by analysts in the month that is nearest to, but preceding, the date a firm announces its actual EPS. First, I convert the SEDOL codes of cross-listed and cross-delisted firms into I/B/E/S tickers using the 'IBES Ticker' item in Worldscope. Second, I use these tickers together with, *inter alia*, the variables ANNDATS_ACT, CNAME, NUMEST and STATPERS from the I/B/E/S database to obtain data on the number of estimates made by analysts (monthly) and the announcement date of the actual EPS.

The data needed to construct STURN are obtained using the SEDOL codes, the 'Volume' item in Datastream and the 'CommonSharesOutstanding' item in Worldscope (both in millions). The first item shows the number of shares traded for a stock on a particular day. The second item represents the number of shares outstanding at year's end. It is the difference between issued shares and treasury shares. To calculate the turnover ratio, I sum the daily trading volumes to obtain data on annual trading volume. Thereafter, I divide the annual trading volume by the number of shares outstanding and multiply it by 100.

The average relative bid-ask spread also has to be calculated and is not directly available from one of the sources. As previously mentioned, RBIDASK is calculated by taking the yearly

[10] According to Kaufmann et al. (2011), it is important to keep in mind that the distinction between 'subjective' and 'objective' data is often less clear-cut than it might seem. This is because 'objective' measures of governance are often based on the coding of formal laws and regulations, but even this requires judgement on the net effect of potentially conflicting rules.

median value of the absolute value of the daily bid-ask spread scaled by the midpoint between the bid and ask price, like in Erkens (2016). Daily data on closed bid and ask prices are obtained by using SEDOL codes and the 'PriceBid' and 'PriceAsk' items in Datastream.

For the data belonging to the control variables, the study uses mainly Worldscope and Datastream as sources. The data for the variables Log(SIZE), CLOSE, GROWTH and LEVERAGE are directly obtainable by using the SEDOL codes in Worldscope. Data for the variables FFLOAT, Log(VOLATILITY) and Log(VOLUME) are derived using other data. For instance, the free float ratio is equal to the opposite of the closely held shares ratio, which is retrieved from Worldscope. In addition, I take the standard deviation of the daily stock return and the average of the daily trading volume, which are both available on Datastream, to construct the variables Log(VOLATILITY) and Log(VOLUME). See Table 1 (Variable Definitions) in the Appendix for an extensive overview of the sources and items used for all the variables in this study.

5. Empirical results and analysis

This section describes the statistical tests and results in detail. First, the approach used in this regarding outliers is explained. Second, the descriptive statistics are discussed. Last, the results of the regressions are provided and linked to the original hypotheses to reject the null hypothesis or support the alternative hypothesis.

5.1 Winsorizing and scaling

Outliers can have an enormous impact on estimation. To avoid extreme observations altering the outcome, I filter the outliers by year. Because the sample is relatively small, winsorizing is more common because it does not eliminate a potentially non-random portion of the data. Moreover, winsorizing does not drop additional company-year observations from the sample, but replaces the observations in ranks 1 and 100 with less extreme values. This ensures that the extreme values of observations are not deleted from the dataset but are instead trimmed to a lower value. I choose to winsorize by year because this allows me to trim more extreme values for a variable so that there are no outliers in each year. Not winsorizing by year results in winsorizing extreme values for all years combined. The variables ANACOV, SIZE, VOLUME and VOLATILITY are converted into log variables so they could be scaled, which is in line with Leuz and Verrecchia (2000).

5.2 Descriptive statistics

Table 4 in the Appendix presents the descriptive statistics for the combined sample and the separate samples for the variables used in the model in Equation 4. First, it should be noted that the full sample includes 1,350 company-year observations instead of 1,360 because two duplicates in the control group are removed. Panel A of Table 4 shows the descriptive statistics for the three dependent variables. The mean of ANACOV is equal to 14.48, taking 1,108 company-year observations into account, which indicates that a firm in the full sample is followed by approximately 14 financial analysts. This number is slightly higher (15.04) for the cross-listing sample and lower (13.81) for the cross-delisting sample. This is not surprising because the first hypothesis expects the number of analysts to decrease after cross-delisting. However, the descriptive statistics are not enough to support the alternative hypothesis. In addition, it is notable that the cross-listing sample includes many more company-year observations (606) than the cross-delisting sample (502). This is not the case for the variables RBIDASK and STURN. The former has a mean of 0.0009 for the combined sample, which denotes the average difference between the bid and ask prices. Remarkable here is the large difference between the means of the two separate samples: The cross-delisting sample has a mean (0.0113) that was almost six times higher than the cross-listing sample's mean (0.0020). This is in line with the first hypothesis, which expects the bid-ask spread to increase after cross-delisting due to the increase in information asymmetry. However, as mentioned earlier, this information is not enough to reject the null hypothesis because it does not show how the numbers changes during the event window. In contrast to the two other dependent variables, the means for the variable STURN are not as expected. STURN has a higher mean for the cross-delisting sample (113.44) than for the cross-listing sample (108.77), which indicates that the shares of cross-delisting firms are approximately 4.3% more liquid during the test period on average. A possible reason for the higher trading activity of cross-delisting firms is that these investors might be more active in short-selling and buying, which means that they anticipate the share prices more. Further, the mean for all firms is equal to 110.71 for the same period based on 1,279 company-year observations. In other words, the yearly trading volume of a firm's shares is on average slightly higher than their number of outstanding shares at year's end.

Panel B of Table 4 presents the descriptive statistics for the moderating variables. In this study, the four moderating variables are REGQ, RULELAW, CONCORP and AVEINX. The mean of REGQ is equal to -0.10, which means that, on average, the firms' home countries from the total sample have slightly weaker regulatory quality than the US. Both separate

samples have approximately the same mean. This is also the case with the RULELAW, CONCORP and AVEINX variables. This indicates that the control group is well matched with the treatment group. RULELAW and CONCORP have means equal to -0.17 and 0.14, respectively, which means that on average, a firm from the total sample is originating from a country with a slightly weaker rule of law and stronger control of corruption than the US. The variable AVEINX combines the different indicators of legal environment and shows that, on average, a firm from the full sample is originating from a country that has almost the same level of legal environment as the US (-0.04).

Panel C of Table 4 shows the descriptive statistics for the control variables. The mean for the variable SIZE is equal to 22,955 based on 1,287 company-year observations. The control group has a mean (34,404) that is more than three times higher than the mean of the treatment group (11,272), not to mention the median, which is six times higher. As mentioned in the literature review, foreign firms often choose to cross-list in the US to supply large amounts of equity and to increase their shareholder base. The lower market capitalisation of cross-delisting firms can indicate that firms decide to cross-delist for the simple reason that their expectations about the liquidity of the firm's shares are not realised by cross-listing. The control variables CLOSE and FFLOAT show that a large part of the shares are freely traded on the market and that this percentage is higher for the cross-listing sample. CLOSE has a mean of 27.08 for the full sample, which means that 27.08% of the shares are closely-held shares, and that the portion of listed share capital freely traded on the market is equal to 73.27%. In the case of the VOLUME variable, the mean is equal to 8.58, but the trading activity on an average trading day is almost three times higher for the cross-listing sample (12.63) than the cross-delisting sample (4.49). On average, firms have an MTB ratio (GROWTH) equal to 2.46; this ratio is higher for the cross-listing sample (2.74) than the cross-delisting sample (2.18). This means that investors see more growth potential for the cross-listing firms. The mean of the control variable VOLATILITY is equal to 708.95 and has a higher standard deviation of the daily stock return in the cross-listing sample (1,066.61) than in the cross-delisting sample (361.15). Finally, the control variable LEVERAGE shows that cross-delisting firms (30.32) have higher ratio of total debt to total assets when compared with cross-listing firms (24.33). The full sample has a mean of 27.31, which means that, on average, 27.31% of the assets are financed by debt.

5.3 Empirical results

This section elaborates on the empirical results obtained from the overall model based on a sample of 136 firms that cross-delist and 134 firms that stay cross-listed on one of the three major U.S. exchanges (NYSE, NASDAQ and AMEX). All of the regressions performed in this study are controlled for heteroscedasticity. First, I discuss the effect of cross-delisting and the moderating effect of the four different proxies of legal environment on analyst coverage. Thereafter, I examine the same effects on the bid-ask spread. Last, I elaborate on the results for the dependent variable share turnover.

5.3.1 Empirical results of analyst coverage

Hypothesis 1 predicts that cross-listed firms that cross-delist from U.S. stock exchanges face an increase in information asymmetry and that the effect is more pronounced for firms originating from countries with a weaker legal environment than the US'. To test this hypothesis, the focus here is on the effect of cross-delisting on analyst coverage and on the moderating effects of regulatory quality, rule of law, control of corruption and average legal environment on the association between cross-delisting and analyst coverage. All of them are proxies for the level of legal environment in a country. Panel A of Table 5 provides the results of the panel regressions for the analyst coverage based on 976 company-year observations. I analyse the results by creating four different models where I change the moderating variable in order to exactly understand the influence that each might have.

Model (1) includes the moderating variable regulatory quality (REGQ) and has an adjusted R-squared equal to 0.425. The main interaction terms CRDELIST*POST and CRDELIST*POST*REGQ are not significant at the 10% level; the p-value for CRDELIST*POST is equal to 0.112; and the p-value for CRDELIST*POST*REGQ is equal to 0.372. Some of the control variables are significant at 1%, namely Log(SIZE) (p-value: 0.000) and CLOSE (p-value: 0.002). In addition, the control variable Log(VOLUME) is significant at 10% (p-value: 0.094). The remaining control variables are not significant at the 10% level, namely GROWTH (p-value: 0.988) and Log(VOLATILITY) (p-value: 0.507). For the significant variables Log(SIZE), CLOSE and Log(VOLUME), their sign is equal to the expected sign. Further, the coefficients of CRDELIST, POST, REGQ and CRDELIST*REGQ are significant (p-value < 0.10), and the coefficient of the interaction variable REGQ*POST is insignificant (p-value ≥ 0.10). This shows that firms in the cross-delisting sample have more analyst followers than firms in the cross-listing sample, and the effect is more pronounced for a firm from the cross-delisting sample originating from a country with a weaker regulatory

quality than the US. Additionally, firms from a country with a weaker regulatory quality than the US have lower analyst coverage. Finally, the number of analysts is higher for the period after the event of cross-delisting ($0 < t \leq 2$) than for the period before the event of cross-delisting ($-2 \leq t \leq 0$) regarding the total sample.

Model (2) includes the moderating variable rule of law (RULELAW) and has an adjusted R-squared equal to 0.416 which is almost the same as in Model (1). The main interaction terms CRDELIST*POST and CRDELIST*POST*RULELAW are not significant at the 10% level; the p-value for CRDELIST*POST is equal to 0.174; and the p-value for CRDELIST*POST*RULELAW is equal to 0.564. The control variable Log(SIZE) (p-value: 0.000) is significant at the 1% level, and the control variables CLOSE (p-value: 0.010) and Log(VOLUME) (p-value: 0.012) are significant at the 5% level. On the other hand, the control variables GROWTH (p-value: 0.909) and Log(VOLATILITY) (p-value: 0.610) are not significant at the 10% level. For the significant variables Log(SIZE), CLOSE and Log(VOLUME), the sign is equal to the expected sign. Some of the other independent variables are also significant, namely CRDELIST (p-value: 0.000) at the 1% level and POST (p-value: 0.026) at the 5% level. The coefficient of CRDELIST is equal to 0.381, and POST has a coefficient of 0.163, which means that, on average, a firm from the cross-delisting sample is followed by approximately 38.1% more analysts than a firm from the cross-listing sample. The results also suggest that, on average, each firm from the total sample has 16.3% more analyst followers after the event of cross-delisting ($0 < t \leq 2$) than during the period before the event of cross-delisting ($-2 \leq t \leq 0$). The remaining independent variables and interactions (RULELAW, RULELAW*POST and CRDELIST*RULELAW) are not significant at the 10% level (p-value < 0.10).

Model (3) takes control of corruption (CONCORP) into account as the moderating variable and has an adjusted R-squared equal to that of Model (1), namely 0.425. The main interaction variables CRDELIST*POST and CRDELIST*POST*CONCORP are again not significant at the 10% level; the p-value for CRDELIST*POST is equal to 0.144; and CRDELIST*POST*CONCORP has a p-value equal to 0.550. Three of the five control variables are significant, namely Log(SIZE) (p-value: 0.000) at the 1% level, CLOSE (p-value: 0.014) at the 5% level and Log(VOLUME) (p-value: 0.013) at the 5% level. This means, for example, that if market capitalisation increases by 1%, analyst coverage increases by approximately 0.3% based on the total sample. Additionally, analyst coverage decreases with more closely held shares and increases with more trading activity. All of the three significant control variables have a sign in the expected direction. The other two control variables,

GROWTH (p-value: 0.856) and Log(VOLATILITY) (p-value: 0.867), are not significant at the 10% level. Moreover, the independent variables CRDELIST, POST and CONCORP are significant (p-value < 0.05), and the interaction terms CONCORP*POST and CRDELIST*CONCORP are insignificant (p-value ≥ 0.10).

Model (4) includes average legal environment (AVEINX) as the moderating variable, which covers the three indicators of legal environment in one variable. The adjusted R-squared is equal to 0.420 and is comparable with that of the other models. The main interaction terms are insignificant in this model (p-value ≥ 0.10): CRDELIST*POST has a p-value equal to 0.151 and CRDELIST*POST*AVEINX has a p-value of 0.500. The expectation was that all the main interaction terms would have a negative sign, but in all four models this is not the case. Therefore, the results do not reject the null hypothesis and do not provide support for the alternative hypothesis. Nonetheless, the variables CRDELIST (p-value: 0.000), POST (p-value: 0.033) and AVEINX (p-value: 0.024) are significant, which indicates that the amount of analyst coverage differ between the two samples and that, in general, the level of legal environment of the originating country of a firm matter. The results also indicate that the number of analysts following a firm is higher later in the event window than at the beginning of the event window for the total sample. A possible reason why the main interaction terms are insignificant is that analysts stay interested in the firms that cross-delist because of their financial motives even if these firms originate from countries with a weaker legal environment than the US'. In addition, some studies on analyst coverage suggest that the association between analyst following and information asymmetry can be positive, as mentioned in the literature review. As in the other three models, the same control variables are also significant and in the expected direction in Model (4), namely Log(SIZE) (p-value: 0.000), CLOSE (p-value: 0.006) and Log(VOLUME) (p-value: 0.017). The remaining control variables (GROWTH and Log[VOLATILITY]) and interaction terms (AVEINX*POST and CRDELIST*AVEINX) are insignificant at the 10% level (p-value ≥ 0.10). The expectation was of a positive sign for the control variable GROWTH and of a negative sign for the control variable Log(VOLATILITY), but this is not the case in all four models. This means that the number of analysts do not differ between firms based on MTB ratio and standard deviation of the daily stock return.

5.3.2 Empirical results of bid-ask spread

Another way that I choose to test Hypothesis 1 is by examining the effect of cross-delisting on the bid-ask spread and the moderating effects of regulatory quality, rule of law, control of corruption and average legal environment on the association between cross-delisting and the bid-ask spread. Panel B of Table 5 presents the results of the panel regressions regarding the bid-ask spread based on 940 company-year observations. As in the previous section, I perform four different regressions where I change the moderating variable in order to exactly understand the influence that each might have.

Model (1) includes the moderating variable of regulatory quality (REGQ) and has an adjusted R-squared equal to 0.191, which is considerably lower than the adjusted R-squared of the regression with analyst coverage as the dependent variable. The main interaction terms, CRDELIST*POST and CRDELIST*POST*REGQ, are not significant at the 10% level; the p-value for CRDELIST*POST is equal to 0.170; and the p-value for CRDELIST*POST*REGQ is equal to 0.177. The expectation was that both interaction terms would have a positive sign, but this is not the case. Some of the control variables are significant, namely Log(SIZE) (p-value: 0.005) at the 1% level and FFLOAT (p-value: 0.015) at the 5% level. Both of these variables have a negative sign as expected. The remaining control variables of Log(VOLUME) (p-value: 0.313) and Log(VOLATILITY) (p-value: 0.116) are insignificant (p-value $\geq$ 0.10). Furthermore, the variables and interaction terms CRDELIST, POST, REGQ, REGQ*POST and CRDELIST*REGQ are also insignificant at the 10% level.

Model (2) includes the moderating variable rule of law (RULELAW) and has an adjusted R-squared equal to 0.186. The main interaction terms, CRDELIST*POST and CRDELIST*POST*RULELAW, are again insignificant (p-value $\geq$ 0.10); specifically, the p-value for CRDELIST*POST is equal to 0.149 and the p-value for CRDELIST*POST*RULELAW is equal to 0.132. The control variable Log(SIZE) (p-value: 0.004) is significant at the 1% level, and FFLOAT (p-value: 0.015) is significant at the 5% level. The negative association between Log(SIZE) and the bid-ask spread indicates that large firms have less information asymmetry and, as a result, a better information environment. Furthermore, the negative association between FFLOAT and the bid-ask spread shows that the information asymmetry between insiders and outsiders decreases when more shares of a firm are freely traded on the market. Both variables have the expected sign. The other control variables, Log(VOLUME) (p-value: 0.264) and LOG(VOLATILITY) (p-value: 0.122), are not significant at the 10% level. The independent variable CRDELIST is significant (p-value < 0.10) and has a negative sign, which means that the cross-delisting sample has a lower bid-ask

spread (information asymmetry) than the cross-listing sample. The remaining independent variables and interaction terms (POST, RULELAW, RULELAW*POST and CRDELIST*RULELAW) are insignificant (p-value ≥ 0.10).

Model (3) takes control of corruption (CONCORP) into account as the moderating variable and has an adjusted R-squared equal to 0.184. The results show that the main interaction terms are insignificant; specifically, CRDELIST*POST has a p-value of 0.161, and CRDELIST*POST*CONCORP has a p-value of 0.167. Two of the four control variables are significant, Log(SIZE) (p-value: 0.005) at the 1% level and FFLOAT (p-value: 0.012) at the 5% level. The other two control variables, Log(VOLUME) and Log(VOLATILITY) are insignificant (p-value ≥ 0.10). Further, the independent variable CRDELIST (p-value: 0.074) is significant, and the remaining independent variables and interaction terms (POST, CONCORP, CONCORP*POST and CRDELIST*CONCORP) are not significant at the 10% level.

Model (4) is the last one with the bid-ask spread as the dependent variable and includes average legal environment (AVEINX) as the moderating variable. As mentioned earlier, this variable covers regulatory quality, rule of law and control of corruption together. The adjusted R-squared is equal to 0.184 and is comparable to that of the other three models. Another similarity with the other models is that the main interaction terms are also insignificant here: CRDELIST*POST has a p-value of 0.163, and CRDELIST*POST*AVEINX has a p-value of 0.168. The expectation was of a positive sign for the main interaction terms, but this is not the case in all the models with the bid-ask spread. As a result, the results do not provide the necessary evidence to suggest the null hypothesis is false, like in the previous section. A possible reason why the main interaction terms are insignificant is that information asymmetry might not have increase after cross-delisting and investors keep their trust in these firms even when they originate from countries with a weaker legal environment than the US'. This could be the case in a firm that does not change much in its way of doing business and retains the same structure of making and disclosing its financial statements despite the requirements of the local legal environment. Like in the other models, the same control variables are significant and show the expected (negative) direction in Model (4), namely Log(SIZE) (p-value: 0.004) at the 1% level and FFLOAT (p-value: 0.015) at the 5% level. On the other hand, the control variables Log(VOLUME) and Log(VOLATILITY) are not significant at the 10% level, though I expected a negative sign for the first and a positive sign for the second. The remaining independent variables (CRDELIST, POST and AVEINX) and interaction terms (AVEINX*POST and CRDELIST*AVEINX) are insignificant (p-value ≥ 0.10).

5.3.3 Empirical results of share turnover

Hypothesis 2 predicts that cross-listed firms that cross-delist from U.S. stock exchanges face a decrease in liquidity. The effect is more pronounced for firms originating from countries with a weaker legal environment than the US'. To test this hypothesis, I examine the effect of cross-delisting on the share turnover ratio (as a percentage) and the moderating effects of regulatory quality, rule of law, control of corruption and average legal environment on the association between cross-delisting and the share turnover. I choose four different proxies for legal environment to examine which proxy is more important for investors and to investigate whether differences arise in the results when several proxies are used to measure countries' legal environments. Panel C of Table 5 provides the results of the panel regressions for share turnover based on 1,082 company-year observations. I perform four different regressions, each with a different moderating variable (proxy of legal environment) in order to understand exactly the influence that each one might have.

Model (1) includes the moderating variable regulatory quality (REGQ) and has an adjusted R-squared equal to 0.092, which is quite low in comparison with the models for analyst coverage and bid-ask spread. The main interaction terms, CRDELIST*POST and CRDELIST*POST*REGQ, are not significant at the 10% level; the p-value of CRDELIST*POST is equal to 0.266; and the p-value for CRDELIST*POST*REGQ is equal to 0.139. The expectation was that both interaction terms would have a negative sign, but this is not the case. Some of the control variables are significant, namely Log(SIZE) (p-value: 0.000), Log(ANACOV) (p-value: 0.000) and Log(VOLATILITY) (p-value: 0.000) at the 1% level. Only Log(ANACOV) has a (positive) sign as expected, and the other two significant control variables have a sign in the opposite direction than expected. The association between Log(SIZE) and share turnover is negative, which means that the shares of bigger firms are traded relatively less than those of smaller firms. Additionally, the results indicate that volatility is positively associated with firms' share turnover ratio (liquidity). A possible reason for this is that during more uncertainty, the number of investors' varying opinions about firms' futures rises which could have increased the trading activity, as discussed in section 4.2.3. The other two control variables are insignificant (p-value $\geq$ 0.10), namely GROWTH, which has a p-value of 0.263, and LEVERAGE, which has a p-value of 0.428. The independent variables CRDELIST and REGQ are also not significant at the 10% level. On the other hand, POST, REGQ*POST and CRDELIST*REGQ are significant (p-value < 0.10). The association between POST and STURN is negative, which means that liquidity based on the total sample declines after the event of cross-delisting ($0 < t \leq 2$) compared to the period before the event

of cross-delisting ($-2 \leq t \leq 0$), although the effect is in the opposite direction for firms originating from a country with a weaker regulatory quality than the US'. Furthermore, the positive sign of the significant interaction term CRDELIST*REGQ indicates that the shares of a firm from the cross-delisting sample originating from a country with a weaker regulatory quality than the US' are relatively more liquid than the shares of other firms. It is plausible that investors choose to short sell and buy the shares of former firms more often due to the uncertainty that they entails which subsequently increase the liquidity of their shares.

Model (2) includes the moderating variable rule of law (RULELAW) and has an adjusted R-squared equal to 0.098. The main interaction terms, CRDELIST*POST and CRDELIST*POST*RULELAW, are again insignificant (p-value ≥ 0.10). The p-value of CRDELIST*POST is equal to 0.621 and the p-value of CRDELIST*POST*RULELAW is equal to 0.395. Like in the previous model, the control variables Log(SIZE) (p-value: 0.000), Log(ANACOV) (p-value: 0.000) and Log(VOLATILITY) are significant at the 1% and have the same direction. The positive association between Log(ANACOV) and STURN indicates that a part of the liquidity of firm's shares could be explained by the level of information transparency (analyst coverage). On the other hand, the control variables GROWTH (p-value: 0.279) and LEVERAGE (p-value: 0.478) are not significant at the 10% level. The independent variables CRDELIST, POST and RULELAW and the interaction term RULELAW*POST are also not significant at the 10% level. The interaction term CRDELIST*RULELAW shows the same results as in Model (1) but this time with another moderating variable (rule of law).

Model (3) takes the moderating variable control of corruption (CONCORP) into account and has an adjusted R-squared equal to 0.086. The results show that the main interaction terms are insignificant, namely that CRDELIST*POST has a p-value of 0.951 and CRDELIST*POST*CONCORP has a p-value of 0.859. Three of the five control variables are significant at the 1% level and keep their sign in the same direction, like in prior models with share turnover as the dependent variable; these are Log(SIZE) (p-value: 0.000), Log(ANACOV) (p-value: 0.000) and Log(VOLATILITY) (p-value: 0.000). The coefficient of Log(ANACOV) is equal to 28.861, which means that if analyst coverage increases by 1%, the share turnover ratio increases by approximately 0.29 percentage points. The other two control variables, GROWTH (p-value: 0.271) and LEVERAGE (p-value: 0.535), are insignificant (p-value ≥ 0.10). The remaining independent variables (CRDELIST, POST and CONCORP) and interaction terms (CONCORP*POST and CRDELIST*CONCORP) are also not significant at the 10% level.

Model (4) is the last one with share turnover as the dependent variable and includes average legal environment (AVEINX) as the moderating variable. This model has the highest adjusted R-squared compared to the other three models in Panel C of Table 5 and is equal to 0.100. This means that the combined variable (AVEINX), which includes the factors regulatory quality, rule of law and control of corruption explains the proportion of the variance in share turnover more than each factor do separately. The main interaction terms (CRDELIST*POST and CRDELIST*POST*AVEINX) are also insignificant in this model (p-value $\geq$ 0.10). CRDELIST*POST has a p-value of 0.521, and CRDELIST*POST*AVEINX has a p-value of 0.290. The expectation was of a negative sign for the main interaction terms, but this is not the case in all models with share turnover as the dependent variable. As a consequence, the results do not provide the evidence to suggest the null hypothesis is false in order to reject it. A possible reason why the main interaction terms are insignificant is that during more uncertainty around the firm due to the event of cross-delisting, the number of investors' varying opinions about firms' futures rises which could have increase the trading activity instead of deceasing the liquidity of cross-delisting firms. Another reason why cross-delisting does not decrease the liquidity of firms' shares could have been that investors keep their trust in the firms that cross-delist from one of three major U.S. exchanges (NYSE, AMAEX and NASDAQ) because of the positive reputation or brand name that these firms built throughout the years, even if they originate from countries with weaker legal environments than the US'. Like in the other three models, the control variables Log(SIZE), Log(ANACOV) and Log(VOLATILITY) are significant at the 1% level (p-value: 0.000) and show the same direction in Model (4). Only Log(ANACOV) has a sign in the expected (positive) direction, and the other two significant control variables have a negative sign, while the expectation was of a positive one. On the other hand, the control variables GROWTH and LEVERAGE are not significant at the 10% level, and I expected a negative sign for both of them. The interaction term CRDELIST*AVEINX is again significant (p-value: 0.003), which means that firms from the cross-delisting sample originating from countries with a weaker legal environment than the US' have more liquid shares. As mentioned earlier, uncertainty results in heavily varying opinions about a firm's future; in this case, cross-delisted firms during the period just before and after the event of cross-delisting could have been seen as more volatile, especially those originating from countries with a weaker legal environment than the US', which increases the liquidity of their shares. The remaining independent variables (CRDELIST, POST and AVEINX) and interaction term (AVEINX*POST) are not significant at the 10% level (p-value $\geq$ 0.10).

6. Conclusion

This study examines the economic consequences of cross-delisting and particularly focusses on foreign firms cross-delisted from U.S. stock exchanges (NYSE, NASDAQ and AMEX) and on information asymmetry and liquidity, taking into account the legal environments of the home countries. Based on the results of the studies of La Porta et al. (1996, 1997, 2000), I decided to emphasise the differences in legal systems between several countries and the US. Thus, the models in this study includes variegated proxies of legal environment as the moderating variable. I use data from the WGI project (2015) headed by Daniel Kaufmann as the main source for determining legal environment. The WGI project provides data for regulatory quality, rule of law and control of corruption which are used to define the level of legal environment in a country. Additionally, I combine these three indicators to create a balanced index for legal environment. The study also uses two different proxies (analyst coverage and bid-ask spread) to measure information asymmetry and one proxy (share turnover) to measure liquidity. Hence, 12 different panel regressions are performed in this study, four for each dependent variable.

By evaluating the results of these regressions, I find no evidence to suggest that cross-listed firms that cross-delist from the U.S. stock exchanges face an increase in information asymmetry or a decrease in liquidity. I also find no evidence that the effect is more pronounced for firms originating from countries with a weaker legal environment than the US'. This means that the results are not consistent with the expectations. The results show that the event of cross-delisting does not have a significant effect on analyst coverage, bid-ask spread or share turnover. Additionally, the moderating effects of regulatory quality, rule of law, control of corruption and the combined indicator are not significant in any model. However, the results indicate that, in general, the differences in the levels of legal environment between the US and firms' home countries is still important to investors, because firms originating from a country with a weaker legal environment than the US' have less analyst coverage, which means more information asymmetry.

The aim of this study was to find support for the bonding and liquidity hypotheses, but the results do not provide the evidence needed to do so. Nonetheless, the study still contributes to the current debate on these two hypotheses by examining the effect of cross-delisting on information asymmetry and liquidity. In addition, the results of the models fill the gap in the literature about the economic consequences of cross-delisting by also taking into account the differences in legal environment between the US and other countries. Furthermore, the findings show how important the level of legal environment in a country is to the degree of information

asymmetry between insiders and outsiders of a firm. This is in line with the studies of La Porta et al. (1996, 1997, 2000) and contributes to their statement that suggests that a country's legal environment matters for financial systems and that it influences economic consequences. This can change the way of thinking about the meaning of the legal environment in a country and can be used by regulators and other public policy makers to emphasise the importance of continuous improvements in laws, regulations and their enforcements. The findings also suggest that key stakeholders, especially investors and financial analysts, do not react differently to firms that cross-delist compared to firms that stay cross-listed, even if the originating country has a weaker legal environment than the US'. Considering the studies on cross-listing in general, it seems that key stakeholders react differently to the event of cross-delisting than to the event of cross-listing. This gives new insights into the behaviour of key stakeholders and can be used to predict their reactions on future cross-delistings. Additionally, this new insights could be used by companies, management and other (potential) investors to anticipate on it.

A possible reason why the first hypothesis of this study is rejected is that the association between analyst coverage and information asymmetry can also be reversed, because informed trading is more costly in cases in which the firm commits to a broader disclosure policy (Kim & Verracchia, 2001). Obtaining private information is less profitable after an increase in disclosure, the added reporting and disclosure required by regulators for cross-listed firms could crowd out or substitute for the collection of private information (Fernandes & Ferreira, 2008). On the other hand, it is possible that analysts stay interested in firms that cross-delist even if these firms originate from countries with a weaker legal environment than the US' because of their financial motives. In addition, the results show that the bid-ask spread does not change due to the event of cross-delisting, which suggests that investors continue to rely on these firms regardless of the levels of legal environment in the firms' home countries. This might occur when a firm does not change much in their way of doing business and retains the same structure of making and disclosing their financial statements, despite the requirements of the local legal environment. The second hypothesis might have been rejected because during (more) uncertainty about a firm due to the event of cross-delisting, the number of investors' varying opinions about a firm's future rises, which can increase the trading activity instead of decreasing the liquidity. It is plausible that investors choose to short sell and buy the shares of cross-delisted firms more often due to their uncertainty, which subsequently increases the liquidity of their shares or at least maintains the level of liquidity that existed before the event. Another reason why cross-delisting does not decrease the liquidity of firms' shares could be

that investors keep their trust in the firms that cross-delist from one of three major U.S. exchanges (NYSE, NASDAQ and AMEX) because of the positive reputation or brand name that these firms have built throughout the years, even if the firm originates from a country with a weaker legal environment than the US'. To put it briefly, the reason why the two hypotheses are rejected may be due the two-sided effects of cross-delisting on information asymmetry and liquidity that compensate each other; it may also be due to the financial motives and trust in the firms by key stakeholders after cross-delisting, regardless of the differences in legal environment between the US and the firms' home countries.

After testing and deliberating over the results, it is crucial to refer to the factors that create limitations in this research. First of all, the data on cross-delisting from the CRSP database is noisy and is manually checked for, *inter alia*, mergers, acquisitions, liquidations, etc. In addition, many cross-delisted firms from the CRSP database are inactive during the sample period, which should be taken into account. Second, the cross-delisting sample is small because of the relatively low number of cross-delistings each year from the U.S. stock markets compared to the total number of cross-listings in the US. Moreover, missing data and SEDOL codes of cross-delisted firms make the sample size even smaller. Third, both samples in this study generally consists of firms originating from countries with a strong legal environment, which is remarkable considering the bonding hypothesis. This makes it difficult to examine the influence of differences in legal environments on the association among cross-delisting, information asymmetry and liquidity. Fourth, the data obtained from the WGI project rely exclusively on perceptions-based governance data sources, including surveys of firms and households and the subjective assessments of a variety of commercial business information providers, non-governmental organisations and a number of multilateral organisations and other public-sector bodies. However, according to Kaufmann et al. (2011), it is important to keep in mind that the distinction between 'subjective' and 'objective' data is often less clear-cut than it might seem. This is because 'objective' measures of governance are often based on the coding of formal laws and regulations, but even this requires judgement about the net effect of potentially conflicting rules. Finally, I would like to point out the relatively low R-squares in some models used in this study, which indicate the risk of omitted variables.

In this thesis, I have researched the relationship between cross-delisting, information asymmetry and liquidity, taking differences in legal environment into account. It would be interesting for future research to examine the effect of cross-delisting with the same moderating effects on the valuation of share prices, which would highlight another economic consequence of cross-delisting. I use dummies in this study to distinguish between strong and weak legal

systems, but it would be interesting to see more classes or a continuous variable in other studies in order to compare the results with those of this study. Additionally, this study could be repeated with a different time window, examining the effects after one or three years. Finally, it would be interesting to research the economic consequences of cross-delisting with a focus on the stock exchanges of other countries, such as, for example, the London Stock Exchange, and consider the differences in legal environments between that country and the rest.

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8. Appendix

Table 1: Variable Definitions

Variables	Definition
Log(ANACOV)	Analyst coverage, which indicates the natural logarithm of the number of analysts who collect and evaluate information from public and private sources to make forecasts about the future prospects of a specific firm they follow. The needed data on analyst following is derived from the number of estimates by analysts, retrieved from the I/B/E/S database, source #NUMEST.
RBIDASK	Average relative bid-ask spread, which is the yearly median value of the absolute value of the daily bid-ask spread scaled by the midpoint between the bid and ask price. See Equation 1. Daily data on closed ask and bid prices is retrieved from Datastream (DS. PriceAsk & PriceBid, source #UPA, #UPB).
STURN	Share turnover ratio (annual), which is calculated as follows: (Yearly trading volume / Number of outstanding shares year end * 100). Retrieved from Datastream and Worldscope (DS. Volume & WS. CommonSharesOutstanding, source #UVO, #VO, #5301).
CRDELIST	An indicator variable equal to 1 for cross-listed firms that cross-delist from the U.S. exchanges and 0 otherwise. The firms that cross-delist are noted as part of the *treatment group*, and the firms categorised otherwise are the *control group*, consisting of firms that have substantially the same properties as the treatment group but stay cross-listed on one of the three exchanges in the US.
POST	An indicator variable equal to 1 for the period after the event of cross-delisting ($0 < t \leq 2$) and 0 for the period before cross-delisting, including the event itself ($-2 \leq t \leq 0$), where *t* is years.
REGQ	An indicator variable equal to 1 when the originating country of a cross-(de)listed firm has a weaker regulatory quality than the US and 0 otherwise. A country is classified as weak if $s \leq 0$, where *s* is the difference in index scores between the US and the country of interest.

	These scores on regulatory quality are retrieved from the WGI database.
RULELAW	An indicator variable equal to 1 when the originating country of a cross-(de)listed firm has a weaker rule of law than the US and 0 otherwise. A country is classified as weak if $s \leq 0$, where *s* is the difference in index scores between the US and the country of interest. These scores on rule of law are retrieved from the WGI database.
CONCORP	An indicator variable equal to 1 when the originating country of a cross-(de)listed firm has a weaker control of corruption than the US and 0 otherwise. A country is classified as weak if $s \leq 0$, whereby *s* is the difference in index scores between the US and the country of interest. These scores on control of corruption are retrieved from the WGI database.
AVEINX	An indicator variable equal to 1 when the originating country of a cross-(de)listed firm has a weaker legal environment than the US and 0 otherwise. A country is classified as weak if $s \leq 0$, where *s* is the average of the differences in index scores between the US and the country of interest on regulatory quality, rule of law and control of corruption. All the needed scores are retrieved from the WGI database.
Log(SIZE)	The natural logarithm of the year-end market capitalisation expressed in U.S. dollars and calculated as follows: (Market price-year end * Common shares outstanding). Retrieved from Worldscope (WS. YrEndMarketCapUSD, source #07210).
CLOSE	The annual ratio of closely held shares for a specific firm. Calculated as follows: (Number of closely held shares / Common shares outstanding * 100). Retrieved from Worldscope (WS. CloselyHeldSharesPct, source #08021).
Log(VOLUME)	The natural logarithm of the average number of shares traded for a stock on a particular trading day. The figure is always expressed in millions. Data on daily trading volume are retrieved from Datastream (DS. Volume, source #UVO, #VO).

GROWTH	Market-to-book ratio calculated as follows (Market price-year end / Book value per share). Retrieved from Worldscope (WS. PriceToBookRatioClose, source #09304, #09307).
Log(VOLATILITY)	The natural logarithm of the standard deviation of the daily stock return using the closing price of a stock index. In other words, the standard deviation of the growth value of a share over a specified time is used, assuming dividends are reinvested. Data on daily stock return are retrieved from Datastream (DS. ReturnIndex, source #RI).
FFLOAT	The annual ratio of free float for a specific firm. Calculated as follows: (1 - Number of closely held shares / Common shares outstanding * 100). This formula is derived from the formula for the closely held shares ratio, which is retrieved from Worldscope (WS. CloselyHeldSharesPct, source #08021).
LEVERAGE	The annual ratio of total debt to total assets for a specific firm. Calculated as follows: ([Short Term Debt & Current Portion of Long Term Debt + Long Term Debt] / Total Assets * 100). Retrieved from Worldscope (WS. TotalDebtPctTotalAssets, source #08236).

Table 2: Sample Selection Process

Selection Procedure for Sample of Cross-delisted Firms

Selection Criteria	*Firms*
Sample: Delisted firms from the U.S. stock exchanges[1]	4,349
Less: Delisted U.S. firms from the U.S. stock exchanges	(3,796)
Delisted foreign firms from the U.S. stock exchanges[2]	553
Less: Delisted foreign firms due to a merger, acquisition, share exchange, bankruptcy or transfer to another exchange	(257)
Cross-delisted foreign firms after applying the delisting codes[3]	296
Less: Cross-delisted foreign firms due to missing data or SEDOL codes or noise	(160)
Number of cross-delisted foreign firms after checking by hand	136
Total Sample of Cross-delisted Firms	136

[1] Includes the three major U.S. stock exchanges (NYSE, NASDAQ and AMEX).

[2] These include issues with the share codes 30 or 31 (ADRs) and issues with share code 12, which indicates the ordinary shares of companies that are incorporated outside the US.

[3] Stocks with delisting codes below 500 are removed, and stocks with delisting codes 501, 502, 503, 505, 510, 513, 516 and 517 are removed, as they have moved to another U.S. exchange. Stocks with delisting codes 572, 574 and 575 are removed, as the stocks went bankrupt.

Table 3: Sample Distribution

This table presents the distribution of the sample used in the regression analyses by reasoning, country and year. Panel A shows the number of voluntary and involuntary cross-delistings per country. Panel B displays the distribution of the cross-delisting sample by year. Panel C presents the number of cross-listings and cross-delistings per country in combination with the average index scores of REGQ, RULELAW, CONCORP and AVEINX per country.

Panel A: *(In)voluntary cross-delistings by country*

Country	Voluntary Cross-delists[1]	Involuntary Cross-delists[1]	All Cross-delists
Australia	3	6	9
Austria	1	-	1
Belgium	-	-	-
Canada	3	13	16
Chile	1	4	5
Denmark	-	1	1
Finland	-	3	3
France	4	10	14
Germany	6	4	10
Greece	1	-	1
Hong Kong	1	3	4
Hungary	1	-	1
India	1	1	2
Ireland	1	-	1
Israel	4	5	9
Italy	-	1	1
Japan	1	9	10
Korea	1	2	3
Luxembourg	-	3	3
Mexico	-	3	3
Netherlands	1	8	9
Norway	-	3	3
Russia	-	1	1
Singapore	1	2	3
South Africa	-	3	3
Spain	1	2	3
Sweden	2	1	3
Switzerland	-	1	1
Taiwan	1	-	1
Thailand	-	1	1
United Kingdom	2	9	11
Total	37	99	136

[1] Firms that delist at the request of the firm and not at the behest of exchange-of-market regulators are classified as voluntary delistings.

Table 3 (Continued): Sample Distribution

Panel B: *(In)voluntary cross-delistings by year*			
Year	Voluntary Cross-delists[1]	Involuntary Cross-delists[1]	All Cross-delists[2]
2004	3	1	4
2005	3	6	9
2006	3	5	8
2007	6	45	51
2008	6	10	16
2009	4	15	19
2010	8	4	12
2011	2	6	8
2012	2	7	9
Total	37	99	136

[1] Firms that delist at the request of the firm and not at the behest of the exchange-of-market regulators are classified as voluntary delistings.

[2] The total number of cross-delistings per year based on the data of delisting payments, via CRSP.

Table 3 (Continued): Sample Distribution[1]

Panel C: *Cross-(de)listings by country in combination with index scores*						
Country	Cross-delisted during sample period	Cross-listed during sample period	REGQ[2]	RULELAW[3]	CONCORP[4]	AVEINX[5]
Australia	9	4	1.71	1.77	1.98	1.82
Austria	1	-	1.54	1.87	1.80	1.74
Belgium	-	1	1.29	1.34	1.43	1.36
Canada	16	42	1.65	1.76	1.97	1.79
Chile	5	5	1.47	1.30	1.44	1.40
Denmark	1	1	1.81	1.94	2.44	2.06
Finland	3	-	1.78	1.96	2.35	2.03
France	14	4	1.19	1.42	1.38	1.33
Germany	10	3	1.55	1.67	1.80	1.67
Greece	1	-	0.75	0.67	0.12	0.51
Hong Kong	4	3	1.92	1.54	1.84	1.76
Hungary	1	-	1.08	0.79	0.43	0.77
India	2	2	-0.36	0.02	-0.46	-0.27
Ireland	1	-	1.69	1.68	1.58	1.65
Israel	9	9	1.09	0.91	0.88	0.96
Italy	1	3	0.89	0.45	0.22	0.52
Japan	10	12	1.08	1.31	1.37	1.26
Korea	3	3	0.87	0.94	0.45	0.75
Luxembourg	3	2	1.74	1.81	1.99	1.85
Mexico	3	4	0.37	-0.51	-0.34	-0.16
Netherlands	9	5	1.76	1.79	2.11	1.88
Norway	3	1	1.44	1.93	2.10	1.83
Russia	1	-	-0.31	-0.84	-0.93	-0.69
Singapore	3	-	1.88	1.68	2.22	1.93
South Africa	3	4	0.52	0.10	0.19	0.27
Spain	3	3	1.15	1.12	1.08	1.11
Sweden	3	1	1.69	1.91	2.23	1.94
Switzerland	1	-	1.65	1.84	2.12	1.87
Taiwan	1	1	1.09	0.95	0.70	0.91
Thailand	1	-	0.25	-0.05	-0.29	-0.03
United Kingdom	11	23	1.73	1.69	1.77	1.73
Total	136	136	1.22	1.18	1.22	1.21

[1] The variables REGQ, RULELAW, CONCORP and AVEINX are based here on the absolute numbers obtained directly from the WGI database and do not show the differences in index scores with the US.

[2] Reflects the average perceptions of the ability of the government to formulate and implement sound policies and regulations that permitted and promoted private sector development during the test period (2002-2014).

[3] Reflects the average perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police and the courts, as well as the likelihood of crime and violence during the test period (2002-2014).

[4] Reflects the average perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption and 'capture' of the state by elites and private interests during the test period (2002-2014).

[5] Reflects the average combined perceptions about the regulatory quality, rule of law and control of corruption in a country during the test period (2002-2014).

Table 4

Descriptive statistics for 270 cross-delisted firms and firms that stay cross-listed over a five-year event period[1]

Panel A: Dependent Variables[2]

					----------Quantiles----------				
Variable	Reporting	Number[3]	Mean	Std. Dev	Min	0.25	Median	0.75	Max
ANACOV	All Firms	1,108	14.48	10.15	1	6	13	21	51
	If Cross-delisting = 1	502	13.81	9.77	1	5	13	20	42
	If Cross-delisting = 0	606	15.04	10.43	1	7	13	22	51
RBIDASK	All Firms	1,100	0.0067	0.0327	-0.0101	0.0005	0.0012	0.0030	0.7460
	If Cross-delisting = 1	554	0.0113	0.0454	-0.0107	0.0007	0.0017	0.0061	0.7460
	If Cross-delisting = 0	546	0.0020	0.0052	-0.0025	0.0004	0.0009	0.0018	0.0652
STURN	All Firms	1,279	110.71	105.62	0.05	40.62	84.63	148.82	1196.71
	If Cross-delisting = 1	629	113.44	115.20	0.05	28.88	86.75	162.32	1196.71
	If Cross-delisting = 0	650	108.07	95.45	0.39	51.99	84.22	133.67	782.20

Panel B: Moderating variables (Legal environment)[4]

Variable	Reporting	Number	Mean	Std. Dev	Min	0.25	Median	0.75	Max
REGQ	All Firms	1,350	-0.10	0.44	-1.91	-0.36	0.00	0.23	0.60
	If Cross-delisting = 1	680	-0.11	0.44	-1.91	-0.36	-0.02	0.21	0.60
	If Cross-delisting = 0	670	-0.08	0.43	-1.91	-0.36	0.04	0.23	0.56
RULELAW	All Firms	1,350	-0.17	0.57	-2.43	-0.30	0.09	0.19	0.52
	If Cross-delisting = 1	680	-0.18	0.57	-2.43	-0.31	0.05	0.18	0.52
	If Cross-delisting = 0	670	-0.17	0.57	-2.33	-0.30	0.11	0.19	0.52
CONCORP	All Firms	1,350	0.14	0.69	-2.39	-0.13	0.34	0.64	1.24
	If Cross-delisting = 1	680	0.14	0.70	-2.39	-0.13	0.34	0.64	1.24
	If Cross-delisting = 0	670	0.14	0.68	-2.06	-0.13	0.34	0.64	1.23

Panel B: Moderating variables (Legal environment), *Continued*

					Quantiles				
Variable	Reporting	Number	Mean	Std. Dev	Min	0.25	Median	0.75	Max
AVEINX	All Firms	1,350	-0.04	0.54	-2.15	-0.25	0.19	0.32	0.62
	If Cross-delisting = 1	680	-0.05	0.55	-2.15	-0.25	0.18	0.33	0.62
	If Cross-delisting = 0	670	-0.04	0.54	-1.80	-0.25	0.20	0.32	0.60

Panel C: Control Variables (Firm Characteristics)[5]

Variable	Reporting	Number	Mean	Std. Dev	Min	0.25	Median	0.75	Max
SIZE	All Firms	1,287	22,955	34,002	0.05	1,029	8,315	31,350	2.5e+05
	If Cross-delisting = 1	637	11,272	18,520	0.05	214	3,228	11,852	1.2e+05
	If Cross-delisting = 0	650	34,404	41,104	9.30	4,085	19,146	50,279	2.5e+05
CLOSE	All Firms	1,138	27.08	25.77	0.00	3.47	20.66	44.83	99.80
	If Cross-delisting = 1	560	32.00	25.34	0.00	11.14	27.42	50.72	99.80
	If Cross-delisting = 0	578	22.32	25.31	0.01	0.41	12.59	37.04	98.53
FFLOAT	All Firms	1,153	73.27	25.78	0.20	55.76	79.68	97.28	100.00
	If Cross-delisting = 1	565	68.29	25.40	0.20	49.33	72.70	88.90	100.00
	If Cross-delisting = 0	588	78.06	25.25	1.47	64.26	87.87	99.63	100.00
VOLUME	All Firms	1,304	8.58	19.85	0.00	0.15	1.55	6.89	172.85
	If Cross-delisting = 1	649	4.49	9.06	0.00	0.05	0.97	4.50	79.40
	If Cross-delisting = 0	655	12.63	25.89	0.00	0.57	2.49	9.96	172.85
GROWTH	All Firms	1,287	2.46	3.85	-48.87	1.09	1.84	3.04	71.77
	If Cross-delisting = 1	637	2.18	4.97	-48.87	0.87	1.49	2.61	71.77
	If Cross-delisting = 0	650	2.74	2.23	-2.33	1.38	2.20	3.43	23.99
VOLATILITY	All Firms	1,288	708.95	2,286.44	0.00	15.38	66.60	406.19	39,276.81
	If Cross-delisting = 1	653	361.15	1,263.18	0.00	7.32	33.70	183.06	20,761.85
	If Cross-delisting = 0	635	1,066.61	2,952.73	0.35	34.45	125.88	641.43	39,276.81

Panel C: Control Variables (Firm Characteristics), *Continued*

					----------Quantiles----------				
Variable	Reporting	Number	Mean	Std. Dev	Min	0.25	Median	0.75	Max
LEVERAGE	All Firms	1,300	27.31	29.56	0.00	10.40	24.21	35.96	404.15
	If Cross-delisting = 1	647	30.32	37.70	0.00	10.25	26.22	38.42	404.15
	If Cross-delisting = 0	653	24.33	17.73	0.00	10.46	22.20	34.34	108.44

[1] The mean, standard deviation (Std. Dev) and the quantiles are based on the winsorized variables before using log.

[2] ANACOV = the total number of analysts that follow a specific firm. RBIDASK = the average relative bid-ask spread, which is the yearly median value of the absolute value of the daily bid-ask spread scaled by the midpoint between the bid and ask price. STURN = the ratio of yearly trading volume to the number of outstanding shares at the year's end as a percentage.

[3] The number of company-year observations for a specific variable for all firms and for cross-(de)listed firms separately.

[4] The variables REGQ, RULELAW, CONCORP and AVEINX show the differences in index scores between a firm's home country and the US instead of the absolute index scores as in the WGI database. As stated in the variable definitions table, the dummies in this study are based on the differences. REGQ = the difference in index scores between a firm's home country and the US for regulatory quality during the test period (2002-2014). RULELAW = the difference in index scores between a firm's home country and the US of the rule of law during the test period (2002-2014). CONCORP = the difference in index scores between a firm's home country and the US of the control of corruption during the test period (2002-2014). AVEINX = the difference in index scores between a firm's home country and the US of the average of the three separate indicators during the test period (2002-2014).

[5] SIZE = the year-end market capitalisation expressed in millions of U.S. dollars. CLOSE = the annual ratio of closely held shares for a specific firm, as a percentage. VOLUME = the average number of shares traded for a stock on a particular trading day in millions. GROWTH = MTB ratio for a specific firm, as a percentage. VOLATILITY = the standard deviation of the daily stock return. In other words, the standard deviation of the growth value of a share over a specified time. FFLOAT = the annual ratio of free float for a specific firm, as a percentage. LEVERAGE = the annual ratio of total debt to total assets for a specific firm.

Table 5

Results of panel regressions to test H1 and H2 for a sample of 136 firms that cross-delist and 134 firms that stay cross-listed on one of the three major U.S. exchanges (NYSE, NASDAQ and AMEX)[1,2,3,4,5]

Panel A: Analyst Coverage

$Log(ANACOV_{i,t}) = \beta_0 + \beta_1 CRDELIST + \beta_2 POST + \beta_3 LEGENV + \beta_4 CRDELIST*POST + \beta_5 LEGENV*POST + \beta_6 CRDELIST*LEGENV + \beta_7 CRDELIST*POST*LEGENV + \beta_8 Log(SIZE_{i,t}) + \beta_9 CLOSE_{i,t} + \beta_{10} Log(VOLUME_{i,t}) + \beta_{11} GROWTH_{i,t} + \beta_{12} Log(VOLATILITY_{i,t}) + \varepsilon_{i,t}$

Variable	Expected Sign	(1) Coefficient (Std. Dev)	(1) t-statistics (p value)	(2) Coefficient (Std. Dev)	(2) t-statistics (p value)	(3) Coefficient (Std. Dev)	(3) t-statistics (p value)	(4) Coefficient (Std. Dev)	(4) t-statistics (p value)
Intercept		-0.345	-1.61	-0.499	-2.34**	-0.454	-2.17**	-0.489	-2.29**
		(0.214)	(0.107)	(0.214)	(0.020)**	(0.209)	(0.030)**	(0.214)	(0.022)**
CRDELIST		0.204	2.31**	0.381	4.86***	0.363	5.38***	0.372	4.87***
		(0.089)	(0.021)**	(0.078)	(0.000)***	(0.068)	(0.000)***	(0.076)	(0.000)***
POST		0.136	1.89*	0.163	2.24**	0.152	2.24**	0.150	2.13**
		(0.071)	(0.059)*	(0.073)	(0.026)**	(0.068)	(0.025)**	(0.070)	(0.033)**
LEGENV		-0.324	-3.57***	-0.168	-1.63	-0.271	-2.57**	-0.233	-2.27**
		(0.091)	(0.000)***	(0.103)	(0.103)	(0.105)	(0.010)**	(0.103)	(0.024)**
CRDELIST * POST	-	-0.231	-1.59	-0.167	-1.36	-0.153	-1.46	-0.175	-1.44
		(0.145)	(0.112)	(0.123)	(0.174)	(0.105)	(0.144)	(0.122)	(0.151)
LEGENV * POST		0.025	0.21	-0.038	-0.27	-0.012	-0.08	-0.007	-0.05
		(0.121)	(0.837)	(0.139)	(0.785)	(0.156)	(0.938)	(0.144)	(0.960)
CRDELIST * LEGENV		0.294	2.40**	0.014	0.11	-0.034	-0.22	0.048	0.36
		(0.123)	(0.017)**	(0.133)	(0.916)	(0.158)	(0.827)	(0.133)	(0.718)
CRDELIST * POST * LEGENV	-	0.177	0.89	0.118	0.58	0.148	0.60	0.140	0.67
		(0.198)	(0.372)	(0.205)	(0.564)	(0.247)	(0.550)	(0.208)	(0.500)
Log(SIZE)	+	0.308	13.39***	0.308	13.75***	0.302	13.79***	0.310	13.75***
		(0.023)	(0.000)***	(0.022)	(0.000)***	(0.022)	(0.000)***	(0.022)	(0.000)***
CLOSE	-	-0.004	-3.11***	-0.003	-2.57**	-0.003	-2.47**	-0.004	-2.77***
		(0.001)	(0.002)***	(0.001)	(0.010)**	(0.001)	(0.014)**	(0.001)	(0.006)***
Log(VOLUME)	+	0.035	1.68*	0.052	2.52**	0.051	2.49**	0.049	2.39**
		(0.021)	(0.094)*	(0.021)	(0.012)**	(0.020)	(0.013)**	(0.020)	(0.017)**
GROWTH	+	-0.0001	-0.01	0.001	0.11	0.001	0.18	0.0001	0.01
		(0.0072)	(0.988)	(0.007)	(0.909)	(0.008)	(0.856)	(0.0075)	(0.991)
Log(VOLATILITY)	-	-0.009	-0.66	-0.007	-0.51	-0.002	-0.17	-0.007	-0.51
		(0.013)	(0.507)	(0.013)	(0.610)	(0.013)	(0.867)	(0.013)	(0.612)
Observations		*976*		*976*		*976*		*976*	
Adjusted R^2		*0.425*		*0.416*		*0.425*		*0.420*	

Panel B: Bid-Ask Spread

$RBIDASK_{i,t} = \beta_0 + \beta_1 CRDELIST + \beta_2 POST + \beta_3 LEGENV + \beta_4 CRDELIST*POST + \beta_5 LEGENV*POST + \beta_6 CRDELIST*LEGENV + \beta_7 CRDELIST*POST*LEGENV + \beta_8 Log(SIZE_{i,t}) + \beta_9 Log(VOLUME_{i,t}) + \beta_{10} Log(VOLATILITY_{i,t}) + \beta_{11} FFLOAT_{i,t} + \varepsilon_{i,t}$

Variable	Expected Sign	(1) Coefficient (Std. Dev)	(1) t-statistics (p value)	(2) Coefficient (Std. Dev)	(2) t-statistics (p value)	(3) Coefficient (Std. Dev)	(3) t-statistics (p value)	(4) Coefficient (Std. Dev)	(4) t-statistics (p value)
Intercept		0.073	2.96***	0.076	2.90***	0.076	2.90***	0.074	2.92***
		(0.025)	(0.003)***	(0.026)	(0.004)***	(0.026)	(0.004)***	(0.025)	(0.004)***
CRDELIST		-0.007	-1.44	0.007	-1.69*	-0.007	-1.79*	-0.008	-1.64
		(0.005)	(0.150)	(0.004)	(0.092)*	(0.004)	(0.074)*	(0.005)	(0.101)
POST		0.0001	-0.01	-0.002	-1.22	-0.001	-1.16	-0.001	-1.16
		(0.0011)	(0.996)	(0.001)	(0.222)	(0.001)	(0.248)	(0.001)	(0.245)
LEGENV		-0.001	-0.95	-0.002	-0.83	0.0000	0.02	-0.001	-0.48
		(0.001)	(0.340)	(-0.002)	(0.404)	(0.0015)	(0.984)	(0.002)	(0.631)
CRDELIST * POST	+	0.013	1.37	0.011	1.45	0.008	1.40	0.010	1.40
		(0.009)	(0.170)	(0.007)	(0.149)	(0.006)	(0.161)	(0.007)	(0.163)
LEGENV * POST		-0.003	-1.28	0.0000	-0.00	-0.001	-0.41	-0.001	-0.30
		(0.002)	(0.200)	(0.0020)	(0.997)	(0.002)	(0.678)	(0.002)	(0.764)
CRDELIST * LEGENV		0.0000	0.00	0.0003	0.12	-0.003	-0.93	0.001	0.19
		(0.0029)	(0.997)	(0.0026)	(0.903)	(0.003)	(0.354)	(0.003)	(0.847)
CRDELIST * POST * LEGENV	+	-0.012	-1.35	-0.012	-1.51	-0.009	-1.38	-0.010	-1.38
		(0.009)	(0.177)	(0.008)	(0.132)	(0.006)	(0.167)	(0.007)	(0.168)
Log(SIZE)	-	-0.006	-2.84***	-0.006	-2.87***	-0.006	-2.83***	-0.006	-2.86***
		(0.002)	(0.005)***	(0.002)	(0.004)***	(0.002)	(0.005)***	(0.002)	(0.004)***
Log(VOLUME)	-	0.001	1.01	0.001	1.12	0.001	1.05	0.001	1.04
		(0.001)	(0.313)	(0.001)	(0.264)	(0.001)	(0.294)	(0.001)	(0.300)
Log(VOLATILITY)	+	-0.001	-1.57	-0.002	-1.55	-0.002	-1.54	-0.002	-1.55
		(0.002)	(0.116)	(0.001)	(0.122)	(0.001)	(0.123)	(0.001)	(0.122)
FFLOAT	-	-0.0001	-2.44**	-0.0001	-2.43**	-0.0001	-2.52**	-0.0001	-2.44**
		(0.0000)	(0.015)**	(-0.0000)	(0.015)**	(0.0000)	(0.012)**	(0.0000)	(0.015)**
Observations		*940*		*940*		*940*		*940*	
Adjusted R^2		*0.191*		*0.186*		*0.184*		*0.184*	

Panel C: Share Turnover

$STURN_{i,t} = \beta_0 + \beta_1 CRDELIST + \beta_2 POST + \beta_3 LEGENV + \beta_4 CRDELIST*POST + \beta_5 LEGENV*POST + \beta_6 CRDELIST*LEGENV + \beta_7 CRDELIST*POST*LEGENV + \beta_8 Log(SIZE_{i,t}) + \beta_9 GROWTH_{i,t} + \beta_{10} Log(ANACOV_{i,t}) + \beta_{11} LEVERAGE_{i,t} + \beta_{12} Log(VOLATILITY_{i,t}) + \varepsilon_{i,t}$

Variable	Expected Sign	(1) Coefficient (Std. Dev)	(1) t-statistics (p value)	(2) Coefficient (Std. Dev)	(2) t-statistics (p value)	(3) Coefficient (Std. Dev)	(3) t-statistics (p value)	(4) Coefficient (Std. Dev)	(4) t-statistics (p value)
Intercept		113.628	5.66***	110.814	6.06***	102.142	5.67***	109.432	6.01***
		(20.084)	(0.000)***	(18.272)	(0.000)***	(18.030)	(0.000)***	(18.223)	(0.000)***
CRDELIST		-11.631	-0.92	-14.116	-1.37	1.001	0.11	-13.277	-1.32
		(12.586)	(0.356)	(10.297)	(0.171)	(8.974)	(0.911)	(10.090)	(0.188)
POST		-32.885	-3.06***	-11.349	-1.07	-7.751	-0.79	-11.039	-1.07
		(10.754)	(0.002)***	(10.655)	(0.287)	(9.822)	(0.430)	(10.346)	(0.286)
LEGENV		-15.823	-1.49	-9.593	-0.90	-4.510	-0.40	-1.829	-0.17
		(10.648)	(0.138)	(10.670)	(0.369)	(11.229)	(0.688)	(10.837)	(0.866)
CRDELIST * POST	-	18.922	1.11	7.615	0.49	.852	0.06	9.687	0.64
		(16.989)	(0.266)	(15.409)	(0.621)	(13.755)	(0.951)	(15.071)	(0.521)
LEGENV * POST		41.954	2.78***	6.614	0.44	-3.669	-0.23	5.843	0.39
		(15.096)	(0.006)***	(14.912)	(0.657)	(15.660)	(0.815)	(15.108)	(0.699)
CRDELIST * LEGENV		30.887	1.97**	49.237	3.23***	24.522	1.41	47.397	3.01***
		(15.695)	(0.049)**	(15.224)	(0.001)***	(17.338)	(0.158)	(15.725)	(0.003)***
CRDELIST * POST * LEGENV	-	-34.588	-1.48	-19.438	-0.85	-4.670	-0.18	-24.790	-1.06
		(23.339)	(0.139)	(22.822)	(0.395)	(26.266)	(0.859)	(23.403)	(0.290)
Log(SIZE)	+	-11.030	-4.58***	-11.419	-4.71***	-10.618	-4.54***	-11.939	-4.90***
		(2.410)	(0.000)***	(2.424)	(0.000)***	(2.338)	(0.000)***	(2.437)	(0.000)***
GROWTH	-	4.752	1.12	4.561	1.08	4.637	1.10	4.716	1.14
		(4.241)	(0.263)	(4.213)	(0.279)	(4.207)	(0.271)	(4.128)	(0.254)
Log(ANACOV)	+	29.478	7.34***	30.066	7.61***	29.861	7.32***	30.855	7.70***
		(4.015)	(0.000)***	(3.952)	(0.000)***	(4.079)	(0.000)***	(4.007)	(0.000)***
LEVERAGE	-	0.148	0.79	0.129	0.71	0.112	0.62	0.138	0.77
		(0.187)	(0.428)	(0.182)	(0.478)	(0.181)	(0.535)	(0.180)	(0.443)
Log(VOLATILITY)	-	5.414	3.64***	5.557	3.82***	5.441	3.77***	5.745	3.96***
		(1.486)	(0.000)***	(1.455)	(0.000)***	(1.443)	(0.000)***	(1.450)	(0.000)***
Observations		*1,082*		*1082*		*1082*		*1082*	
Adjusted R^2		*0.092*		*0.098*		*0.086*		*0.100*	

[1] The multivariate regressions are based on company-year observations. The *i* indicates a specific company and *t* the year.

[2] The significance levels are as follows: *** p < 0.01, ** p < 0.05, * p < 0.1.

[3] All of the panel regressions performed in this study are controlled for heteroscedasticity.

[4] The variable LEGENV indicates a different variable based on the regression numbers each time (1: REGQ, 2: RULELAW, 3: CONCORP, 4: AVEINX). REGQ = An indicator variable equal to 1 when the originating country of a cross-(de)listed firm has a weaker regulatory quality than the US and 0 otherwise. RULELAW = An indicator variable equal to 1 when the originating country of a cross-(de)listed firm has a weaker rule of law than the US and 0 otherwise. CONCORP = An indicator variable equal to 1 when the originating country of a cross-(de)listed firm has a weaker control of corruption than the US and 0 otherwise. AVEINX = An indicator variable equal to 1 when the originating country of a cross-(de)listed firm has a weaker legal environment than the US and 0 otherwise. To simplify for clarity, I call all of these variables LEGENV in Table 5.

[5] Log(ANACOV) = The natural logarithm of the total number of analysts that follow a specific firm. RBIDASK = The average relative bid-ask spread, which is the yearly median value of the absolute value of the daily bid-ask spread scaled by the midpoint between the bid and ask price. STURN = The ratio of yearly trading volume to the number of outstanding shares at the year's end, as a percentage. Log(SIZE) = The natural logarithm of the year-end market capitalisation expressed in millions of U.S. dollars. CLOSE = The annual ratio of closely held shares for a specific firm, as a percentage. Log(VOLUME) = The natural logarithm of the average number of shares traded for a stock on a particular trading day in millions. GROWTH = MTB ratio for a specific firm, as a percentage. Log(VOLATILITY) = The natural logarithm of the standard deviation of the daily stock return. In other words, the standard deviation of the growth value of a share over a specified time. LEVERAGE = The annual ratio of total debt to total assets for a specific firm.