Erasmus University Rotterdam

The Effect of Cross-listing on Earnings Quality

Author:

Bruce Tjon Tsoe Jin

322200

Supervisor:

Prof.dr. Maarten Pronk

Co-Reader:

Drs. Rob van der Wal RA

Erasmus School of Economics

MSc Accounting, Auditing & Control

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Abstract

This study investigates the relation between US cross-listing and earnings quality. We expect that US cross-listed firms exhibit greater earnings quality as the firms have to adhere to the more stringent and legal requirement of US GAAP. We perceive earnings quality as the ability to predict future earnings based on current reported earnings. Earnings persistence, or earnings predictability, is measured using models where earnings is decomposed into smaller components. The sample consists of 242 firms where half of those firms are US cross-listed firms and the other half are non-cross-listed firm for a total of 3872 firm-year observations. The sample is selected controlling for country, industry and size effects. Our initial results suggest that cross-listed firms have greater earnings persistence compared to non-cross-listed firms. However, the cross-listing effect dissipates when we add control variables which relate to firm characteristics.

Keywords: Earnings Persistence; Earnings subcomponents; Cross-listing

Contents

1 Introduction

1.1 Background

High disclosure quality remains important for stakeholders of accounting information as it is in their best interest that disclosures should reflect the economic reality of the firm. There are numerous ways to measure disclosure quality as there are multiple aspects which have to be considered. Earnings quality is one such measure to determine an aspect of disclosure quality. Earnings quality is broadly defined and has several distinct properties (Dechow et al., 2010). One of the properties is earnings persistence which is the ability that current reported earnings and other accounting variables can predict future earnings. The ability to forecast future earnings is important for investors as they rely on this piece of information in order to determine the future value of the firm. Thus this thesis will perceive earnings quality as the ability to create accurate forecasts of future earnings.

Cross-listing is when a firm lists its shares on another stock exchange that is different from the stock exchange were the firm initially issued their shares. Firms cross-list to either raise capital, improve liquidity or to reduce the stake held by existing shareholders. And more importantly, firms cross-list to increase investor protection by improving disclosure quality and corporate governance standards. The legal bonding hypothesis of Coffee (1998) states that firms willingly expose themselves to higher accounting scrutiny in order to raise the quality of accounting disclosures. The higher level of accounting quality will provide a higher level of assurance for investors. This study will only consider US cross-listing which is characterized that the firms which choose to cross-list on a US stock exchange must adhere to US GAAP.

1.2 Research Question

The main interest is whether cross-listed firms report financial disclosures with higher earnings quality compared to firms which are not cross-listed. As existing literature suggests that cross-listed firms operate under higher levels of accounting quality and financial reporting

enforcement, there is sufficient basis to believe that disclosures of cross-listed firms have higher earnings quality. Therefore, the main research question of this thesis is as follows:

Is the earnings quality of reported disclosures higher for cross-listed firms compared to non-cross-listed firms?

where I define earnings quality as the ability to accurately predict future expected earnings based on current earnings, also known as earnings persistence. We also state additional sub-question in order to answer the main research-question in a more coherent manner. Section 2 will provide insight to these questions and will cover existing literature on the topics. These question are:

- What is the definition of earnings quality and how is this measured?
- What is cross-listing and what are the motives for firms to cross-list?
- What is the relation cross-listing and earnings quality?

1.3 Methodology and Findings

This study perceives earnings quality as the ability to predict future earnings based on current reported earnings. We use earnings persistence measures from five models: (a) an AR(1) model, (b) the model of Sloan (1996), (c) the model of Dechow et al. (2008), (d) the model of Hou et al. (2012) and the model of (e) (Li & Mohanram, 2014).

This study starts with a simple AR(1) model and follows up with the model of Sloan (1996) which extends the AR(1) model by decomposing earnings into an accrual component and a cash flow component. Dechow et al. (2008) further decomposes the cash flow component into three smaller components. The model of Hou et al. (2012) is a earnings forecasting model which manages to beat external analysts' earnings forecasts. The model of Li and Mohanram (2014) is a similar earnings forecasting model which seems to outperform the model of Hou et al. (2012).

The sample consists of 121 US cross-listed firms which originate from outside the US. For each of these firms, a comparable non-cross-listed firm is paired based on country, industry and size. The total sample consists of 242 firms and spans the period from 2001 to 2016 with a total of 3872 firm-year observations. The model variables are calculated using the balance sheet method and the statements of cash flows. The balance sheet method is used in most accounting literature (Sloan, 1996; Dechow et al., 2008). However, Ndubizu and Sallehu (2017) mentions a different calculation based on the statements of cash flows. This study will use both calculation methods to test for robustness.

We initially find a positive effect between cross-listing and earnings persistence. Most models show a positive and significant interaction effect between cross-listing and multiple subcomponent of earnings. Previous literature finds certain relations regarding the persistence levels between the different earnings components. According to Sloan (1996), the cash flow component is more persistent than the accrual component. And Dechow et al. (2008) finds that the distribution to equity holders is more persistent than the distribution to debt holders. We find evidence that is in line with the two notions.

However, when we add control variables we do not measure a significant cross-listing effect on earnings persistence. It seems that the initially measured interaction effect was more indicative of the firm's size and the firm's growth opportunities than the actual cross-listing effect.

1.4 Relevance and Implications

This thesis contributes to the accounting literature in several ways. First, this expands the current accounting literature on cross-listing by documenting changes in earnings quality for US cross-listed firms in terms of earnings persistence. This is useful for standard setters as this study documents changes in earnings persistence between US GAAP and other GAAP across the world. US GAAP can result in earnings which are of higher persistence, and thus provide better expectations of the future value of the firm. Further research can then be warranted how other GAAP can increase earnings persistence as well. However, our results

do not indicate significant differences in earnings persistence between US GAAP and other GAAP. This might be an indication that other GAAP already has a high level of earnings persistence, such that switching to US GAAP adds no increase in earnings persistence. One point of interest is whether the globalization of accounting standards has pushed the quality of other GAAP such that no significant differences in earnings persistence can be found between US GAAP and other GAAP. We advise standard setters to look into this matter.

Second, this study contributes to the earnings quality literature by investigating the effect of cross-listing on earnings persistence. We decompose the cash flow component of earnings into three smaller components as documented in Dechow et al. (2008) and apply this in a cross-listing setting. Previous literature treats the cash flows as homogeneous. However, Dechow et al. (2008) finds that persistence can vary significantly between the different cash flow components. Not recognizing the difference in persistence of these components can result in skewed expectations of the future value of the firm. We expand this model by introducing cross-listing interaction terms which allows for different persistence levels for cross-listed firms. This model can then be further analyzed by assessing the cross-listing effect on each individual cash flow component. The results of our study is useful for investors, analysts and other stakeholders as they rely on accounting information to form expectations about future earnings. A better understanding about the persistence of earnings and its components allow them to better asses the future valuation of the firm.

Finally, the thesis uses the models of Hou et al. (2012) and Li and Mohanram (2014) which are cross-sectional model to forecast future earnings. The models have received increased attention and are frequently used in finance and accounting literature (Larocque and Lyle (2017); Hess and Huettemann (2018); Chattopadhyay et al. (2018); among others). This model manages to generate better earnings forecasts compared to external analyst' forecasts based on mean squared prediction errors and bias. Similar to the model of Dechow et al. (2008), we add cross-listing interaction terms to the models in order to determine how the cross-listing effect influences the different parameters of the models. Using the aforementioned models contributes to existing literature by creating a practical setting where the effect of cross-listing can be assessed. This is particularly useful for investors and analysts as the

model of Hou et al. (2012) and Li and Mohanram (2014) is used directly to measure the future value of the firm.

1.5 Structure

Section 2 presents the theoretical framework and will explain the concepts used in the thesis. Section 3 covers the research design and will describe how my hypothesis are formulated as well as how the models are constructed and evaluated in order to test the hypothesis. Section 4 will report my findings. Section 5 covers the conclusions of all my findings and results. Section 6 will describe the limitations of my research as well as the suggestions for future research

2 Theoretical Framework

2.1 Introduction

This section presents the theoretical framework for the concepts used in the thesis and will provide the rationale for the empirical research which will be presented later on. First, we elaborate on the concept of earnings quality and which proxy we use, as well as discuss prior research regarding earnings quality measures in accounting literature. This is covered in section 2.2 and 2.3, respectively. Section 2.4 presents the concept of cross listing. This section explains the definition as well as the motives for firms to cross list on US financial markets. Specifically, this section presents the legal bonding hypothesis and evidence from existing accounting literature. The link between disclosure quality and cross listing is presented in section 2.5.

2.2 Earnings Quality

2.2.1 Definition of Earnings Quality

Earnings quality remains a vastly discussed topic throughout accounting literature. Numerous different definitions and measures of earnings quality exist and all have different implication as to how this relates to disclosure quality. Dechow et al. (2010) provides an overview of the different definitions and measures of earnings quality. According to Dechow et al. (2010), the definition of earnings quality is: "Higher quality earnings provide more information about the features of a firm's financial performance that are relevant to a specific decision made by a specific decision-maker." It should be noted that the definition contains three features which are of importance. The first feature is that earnings quality is conditional on the decision-relevance of the information. In other words, it is of importance that the earnings quality is only defined if there is a specific context for a decision model. Without it, the definition of earnings quality alone has no meaning. The second feature is that the quality of the reported earnings should be informative of the firm's performance. However, many aspects of the firm's performance is not observable. This leads to multiple measures which try to address the different aspects of the firm's performance. The last feature is that earnings quality can only be determined by the ability of the accounting system to measure performance. The earnings quality definition of Dechow et al. (2010) is a broad definition and provides a framework which lay the foundation how multiple measures of earnings quality can co-exist as for each measure the respective context changes.

Current accounting literature has done extensive research on the various aspects of earnings quality. Dechow et al. (2010) identifies multiples properties of earnings quality. These are (a) earnings persistence, (b) abnormal accruals derived from modeling the accrual process, (c) earnings smoothness, (d) asymmetric timeliness and timely loss recognition and (e) target beating. For each property there exist numerous different proxies which can be used to determine the earnings quality. This thesis only considers earnings persistence, which is the ability to predict future earnings based on current reported earnings.

A large part of the research on earnings persistence focuses on the usefulness of earnings

to equity investors for valuation (Dechow et al., 2010). The objective of the research is to identify financial characteristics which are related with persistent earnings. A simple model estimates earnings persistence as:

$$Earnings_{t+1} = \alpha + \beta\, Earnings_t + \varepsilon_{t+1} \tag{1}$$

A higher β means that there is a higher persistent earnings stream. When a firm has a higher earnings persistence (a higher β) then this means that, in perpetuity, current earnings is a more useful indication of future performance. And as future performance can be better summarized, annuitizing those current earnings will lead to smaller evaluation errors compared to firms which have a lower earnings persistence. Therefore, earnings with higher persistence are of higher earnings quality. The practical aspect is that investors, analysts and other stakeholder use current available information to make accurate assessments of the future performance of the firm. It is of great benefit to them that earnings persistence is high, as that will increase the accuracy of their future expectations of the firm. The next section will cover the accounting literature regarding the earnings persistence models used in this study.

2.3 Measures of Earnings Persistence

2.3.1 Sloan (1996) model

The instrumental paper of Sloan (1996) decomposes earnings into an accruals component and a cash flow components. The model is as follows:

$$Earnings_{t+1} = \beta_0 + \beta_1\, CF_t + \beta_2\, Accruals_t + \varepsilon_{t+1} \tag{2}$$

Sloan (1996) finds that $\beta_2 < \beta_1$ which suggests that the cash flow component is more persistent than the accrual component of earnings. An explanation is that the difference in persistence levels of the two components is because accruals are more subjective in nature and leads to a lower persistence level compared to cash flows. Another finding by Sloan (1996) is that investors do not take into account the different persistence levels between the

two components in regard to valuating the firm.

The earnings persistence of the accrual component of earnings has been greatly discussed in research. Richardson et al. (2005) extends the model of Sloan (1996) by decomposing accruals into reliable and non-reliable accruals. Results suggest that reliable accruals have higher persistence levels compared to non-reliable accruals. Another study by Dechow and Dichev (2002) finds that earnings persistence is positively related with high accrual quality.

2.3.2 Dechow et al. (2008) model

Dechow et al. (2008) extends the research of (Sloan, 1996) by decomposing the cash component of earnings. Prior studies, such as Xie (2001) and Richardson et al. (2005) focuses on the accrual component of earnings and treat the cash component as homogeneous. However, (Dechow et al., 2008) argues that firms have multiple ways to either use or generate cash earnings and can be grouped in three categories. In the case that cash flows are positive, managers can either (a) distribute the cash earnings to investors as dividends or to repurchase stock, (b) distribute the cash earnings to debt holders or (c) retain the cash earnings as financial assets. Vice versa, managers must determine how to finance the shortfalls when cash flows are negative. Managers can either (a) obtain financing from equity holders, (b) obtain financing from debt holders or (c) reduce the current cash balance. The model of Dechow et al. (2008) is as follows:

$$\begin{aligned} EARNINGS_{t+1} = \beta_0 + \beta_1 ACCRUALS_t + \beta_2 \Delta CASH_t + \beta_3 DIST\_D_t \\ + \beta_4 DIST\_E_t + \varepsilon_{t+1} \end{aligned} \tag{3}$$

Note that in comparison to the Sloan (1996) model, the cash component is decomposed into the three categories which are (a) the distribution to equity holders, (b) the distribution to debt holders and (c) the change in cash balance. Dechow et al. (2008) predicts two outcomes regarding the persistence levels of the three individual cash components. The first prediction is that the cash component which is retained by the firm (ΔCASH) is less persistent than the

cash component that is distributed to equity and debt holders (DIST_D and DIST_E). The cash component retained in the firm is more discretionary by nature, and allows managers to "window dress" the balance sheet to enhance the perceived financial valuation of the firm. Managers can engage in activities which can delay expenditures which lead to a temporarily increase in the cash balance. But the cash balance will shortly fall thereafter when the firm catches on to these expenditures. Furthermore, cash retained by the firm are spent on NPV project which have diminishing returns on investment. Additionally, the cash balance can be misrepresented due to accidental accounting errors or fraudulent reporting. While cash is one of accounting items that can be objectively measured, Dechow et al. (2008) mentions that the accounting scandal with the firm Parmalat is a prime example how the cash balance can be misrepresented. Parmalat revealed in 2003 that it did not own $4.9billion in cash funds, but Parmalat did report that amount earlier that year.

The second prediction is that the cash component which is distributed to debt holders (DIST_D) has a lower persistence than the cash component which is distributed to equity holders (DIST_E). Dechow et al. (2008) states that the cash expenditures to debt holders are typically non-discretionary as debt repayments are done according to a set schedule. Debt repayments have therefore low signaling value regarding the future prospects of the firm. However, dividends increases and equity repurchases are more discretionary by nature. Managers increase the discretionary equity expenditures only when firm profitability is likely to persist in the future (Dechow et al., 2008). Therefore, when managers expect only temporarily increases in cash flows, they are more prone to use the cash flows to repay debt holders than to repay equity holders via equity repurchases and dividend increases. The previous discussion is relevant when cash distribution are positive. However, when cash distribution are negative and a firm needs ways to finance their operations, different reasons apply why the distribution to debt holders has lower persistence than distribution to equity holders. If a firm expects losses to recur in the future, the firm is more inclined to raise financing using equity compared to debt. Debt holders are only likely to lend to a firm if their future prospects are positive and stable, as their only reward for their investment is a set of preset payments in the form of principal and interest payments. In this situation, it is more likely to finance via

equity as equity holders are more able to withstand the risk related to default and financial distress.

The two predictions are supported by the finding in their research. Additionally, Dechow et al. (2008) finds that the high persistence of the cash flow component of earnings is mainly attributable to finance activities related to equity (DIST_E). Cash flows which are distributed or generated from debt holders or the financial cash balance (DIST_D and ΔCash) have low persistence levels which are comparable with the low persistence of accruals. The results also imply that investors correctly anticipate the persistence levels related to equity and debt, but fail to anticipate the lower persistence of the change in cash balance.

2.3.3 Hou et al. (2012) model

A different earnings forecast model of Hou et al. (2012) stems from a different spectrum of accounting literature. Estimating the expected stock return of a firm is important in order to determine the relation between expected stock returns and firm-level characteristics (Hou et al., 2012). This is a central theme in both finance and accounting and plays an important part in capital budgeting, firm valuation and other corporate finance settings. Additionally, it is also important for investment related activities for example portfolio allocation and risk control. Early prior literature focused on using current realized stock returns to predict future stock returns. However, empirical studies have shown that current realized stock returns are a noisy measure to predict future stock returns. Several finance and accounting studies use a different approach to estimate future expected stock returns which is the implied cost of capital (Gebhardt et al. (2001); Easton (2004) among others). The implied cost of capital of a specific firm is the internal rate of return where the stock price of a firm corresponds with the present value of future cash flows. One can see the implied cost of capital as the discount rate which the market uses to discount future cash flows. The advantage of using this method of valuation is that is does not require the use of existing current stock returns but only uses current stock prices and cash flow forecasts. Therefore, the implied cost of capital method is widely used in finance and accounting literature (Hou et al., 2012). Previous literature use earnings forecasts from external analysts as a proxy for cash flow expectations. However,

a large body of literature find that the analyst based forecasts are insufficient (Hou et al., 2012). Therefore, Hou et al. (2012) proposes a new approach to calculate the implied cost of capital where they use earnings forecasts from a cross-sectional model instead of using analyst forecasts. The model is as follows:

$$EARNINGS_{t+1} = \beta_0 + \beta_1 ASSETS_t + \beta_2 DIV_t + \beta_3 DD_t + \beta_4 EARNINGS_t + \beta_5 Neg\_E_t + \beta_6 ACCRUALS_t + \varepsilon_{t+1} \tag{4}$$

This is a cross-sectional model where earnings is regressed on past earnings and other accounting variables. Hou et al. (2012) finds that the cross-sectional earnings forecast model manage to generate better earnings forecasts compared to analysts forecasts based on the mean forecasts error and the forecast bias. The model of Hou et al. (2012) has been extensively used by further research. (Patatoukas, 2011; Chang et al., 2012; Jones & Tuzel, 2013; Hess & Huettemann, 2018) As this model manages to generate better earnings forecasts, this thesis will use the same model as a proxy for future earnings in order to evaluate the effect of cross-listing.

2.3.4 Li & Mohanram (2014) model

As the model of Hou et al. (2012) gained a large following in the academic literature, it becomes imperative to test the models for further misspecification. Li and Mohanram (2014) studies the performance of the Hou et al. (2012) model by benchmarking it to other models. One model of importance is the earnings persistence (EP) model which is as follows:

$$EARNINGS_{t+1} = \beta_0 + \beta_1 NegE_t + \beta_2 EARNINGS_t + \beta_3 NegE \times EARNINGS_t + \varepsilon_{t+1} \tag{5}$$

This model includes a dummy for negative earnings and thus allows for different persistence levels for both profit and loss situations. Li and Mohanram (2014) finds that this models outperforms the model of Hou et al. (2012) in terms of forecast accuracy and bias. The study

also mentions that the parsimonious models, models with only few parameters, in general outperform the more complex models. Consequently, academic accounting literature has adopted the EP model of Li and Mohanram (2014) to forecast future earnings (Larocque & Lyle, 2017; Hess & Huettemann, 2018; Chattopadhyay et al., 2018). Due to the high performance of the EP model and its relevance for earnings persistence, This thesis will include the EP model to measure the cross-listing effect on earnings quality.

2.4 Cross Listing

2.4.1 Definition of Cross Listing

Cross-listing is defined as when a firm lists its equity shares on one or more foreign stock exchanges in addition to its domestic exchange. Cross-listing allows firms to list their entities on stock exchanges which are different then their home countries. For example, a firm originated in Europe which has its shares listed on a domestic stock exchange based in Europe, can decide to also list its shares on a stock exchange based in the United States. In doing so, it will be regarded as a cross-listed firm as its shares are listed on more than one stock exchange.

This thesis will only consider US cross-listings. More specifically, only the firms which originate outside of the US which decide to additionally list their shares on an American stock exchange will be considered. Therefore this section will only cover the American legislation regarding cross-listing shares on American stock exchanges. Cross-listing in the US is achieved by using American Depositary receipts. An American Depositary Receipt (ADR hereafter) is a negotiable security which represents the securities of a non-US firm that is tradable on US financial markets. Firms which have decided to cross list their shares can be categorized in four categories: (a) ADR level 1, (b) ADR level 2, (c) ADR level 3 and (d) firms registered under rule 144a (Boubakri et al., 2010). The requirement to issue ADR level 1 securities is minimal as it only requires a listing of the shares on a different stock exchange on foreign jurisdictions. Additionally, the firm has to deliver an annual report. Firms registered under rule 144a are only allowed to trade with US private institutional investors and

do not require supervision by the SEC. Firms which decide to cross-list their shares in the US which use the ADR programs level 2 and 3 are subject to more strict requirements. The firms have to pay large continuing fees and they must meet size and earnings requirements. Furthermore, they have to annually hand in a report on form 20-F. More importantly, the financial statements of the last three years must adhere to US GAAP standards. ADR level 2 and 3 securities are available for trade on the large regulatory exchanges like AMEX, NYSE and NASDAQ whereas ADR level 1 securities and shares of firms under rule 144a are traded on unregulated exchanges. For the thesis, the firms who fall under the ADR level 1 category and the firms which are registered under rule 144a are not of importance as the 'bonding effect", which will be explained later on, is not strong for these firm.

2.4.2 Motives for Cross Listing

An important question is why firms decide to cross list their shares on foreign exchanges. Existing literature find several reasons and these are (a) raising capital and improving liquidity, (b) reducing the stake held by existing stakeholders and (c) investor protection by having higher disclosure quality and governance standards. (Boubakri et al., 2010; Roosenboom & Van Dijk, 2009)

One of the reasons why firms cross-list is that it becomes easier to raise capital and improve liquidity. Cross-listing overcomes international investment barriers which leads to a reduction of the cost of capital. This is caused by a reduction in risk as the investment barrier disappears which allows firms to raise capital at lower costs (Errunza & Losq, 1985). Cross-listing also allows firms to improve their liquidity as it draws in foreign investors. This leads to a broadening of the shareholder base and an increase of their stock liquidity. Foerster and Karolyi (1999) document that Canadian firms which cross-list their shares in the US show an increase in trading volume and a decrease in effective spreads. According to Aggarwal et al. (2007), US cross-listings leads to an increase of institutional investors who prioritize to invest in ADRs and prioritize less on the underlying shares of the cross listed firm in their local financial market.

The second reason is that cross-listing can lead to a reduction of the stake which is held

by existing stakeholders. Controlling stakeholders of foreign firms can use cross-listing to make a change in ownership easier (Ayyagari & Doidge, 2010). This can happen if they face domestic stock exchange constraints where it is not easy to trade securities. Cross-listing is then a viable option to reduce the stake of existing stakeholders.

The final reason, and the most important reason for the thesis, is that cross-listed firms have more stringent legal and regulatory requirements than the firms' local financial market. Cross-listing on a stock exchange which has higher standards of investor protection is called 'Bonding' (Coffee, 1998). This can lead to a number of positive advantages for cross-listed firms. Firms use cross-listing on financial markets with more stringent disclosure requirements to signal their quality to foreign investors on the foreign financial market which in turn can lead to reducing the cost of capital. (Cantale (1996); Fuerst (1998); Moel et al. (2001)). Additionally, this also provides a higher level of assurance for local investors on the domestic financial market where weak shareholder protection is the norm. In some local domestic financial markets shareholder protection may be weak in the sense that there is insufficient information and limited assurance of the firms' performance. Insiders are willingly to expose the firm to more strict regulation in order to provide a higher level of assurance to protect minority shareholders. This can create an influx capital of investors which would otherwise not occur under less strict regulatory requirements. Literature on the bonding hypothesis is extensive. The next section covers the bonding in more detail and gives an overview of existing literature about as it is important for the remainder of the thesis.

2.4.3 Legal Bonding Hypothesis

This section will focus on the legal bonding hypothesis and the relevant literature. The bonding hypothesis is first introduced by Coffee (1998). It was around the 1990's that cross-listing on foreign stock exchange became possible and more frequent that it became a point of interest for researchers why firms choose to cross list their shares. According to Coffee (1998), cross-listings on foreign stock exchanges encourages more investors to invest in the cross-listed firms. This is caused by the stronger legal protections which are present for cross-listed

firms. Coffee (1998) further states that the increase in legal protection are caused by the federal securities laws which are enforced by an agency which is now known as the Securities and Exchange Commission (SEC). These laws enforces a higher control on corporate transactions and leads to a better corporate governance. This improves shareholder protection and can in turn lead to increased investments. Another important piece of literature around the same time period by Stulz (1999) further explores the legal bonding hypothesis and reaffirms Coffee (1998)'s notion of the bonding effect. Stulz (1999) argues that agency costs and information asymmetry play an important role for investors as they are determinants for reducing the cost of capital. According to Stulz (1999), firms which originate in less-developed financial markets and are cross-listed on US financial markets, import certain aspects of the corporate governance systems of the US. This leads to a bonding effect where the stakeholders of the firm enjoy greater shareholder protection. Firms can therefore provide their stakeholders a certain level of protection and regulation by choosing to cross-list.

The legal bonding hypothesis of Stulz (1999) and Coffee (1998) is supported by a large number of research. Reese and Weisbach (2002) focuses on the quality of protection which is provided to minority shareholders in the context of firms which are cross-listed in the US. Firms from French Civil Law countries, which are characterized by the weakest form of protection for minority shareholders, are more likely to cross-list on a US market exchange compared to firms from English Common Law countries. This is in line with the bonding hypothesis as the firms attempt to protect their shareholders by subjecting to US securities law and are also required to conform to US GAAP.

Doidge et al. (2004) argue that cross-listing limits the expropriation of minority stakeholders by the controlling stakeholders and in turn allows the firm to take more advantage of growth opportunities. The higher minority investor protection due to cross-listing leads to less private benefits being consumed by controlling shareholders. Results have shown that cross-listed firms which are under the ADR level 2 or 3 categories have higher Tobin's q compared to firm which are not cross-listed. This implies that the cross-listed firms have taken more advantage of growth opportunities, presumably due to the fact that more resources are available as controlling stakeholders are able to consume less. This finding shows that firms

are willingly to commit to higher levels of control and minority shareholder protection which is favorable for the value of the firm.

Abdallah and Goergen (2008) have closely observed a sample of firms which have chosen to cross-list across different stock exchanges. Their variable of interest is the change in investor protection as a result of cross-listing. They have managed to identify that the decision to cross-list on other stock exchanges is driven by the desire to restructure investor protection in favor of the investor. This is in line with the prediction of the bonding hypothesis.

O'Connor (2006) tests the proposition if domestic investors are better protected post-cross-listing. O'Connor (2006) uses the change of dividend payouts as a measure for investor protection. Results show that firms pay lower dividends after cross-listing, which is in line with the notion that shareholders exchange dividends for higher investor protection. Results are robust if firm, country and industry controls are added. Firms under rule 144a show no change in dividend payouts and is also in line with the bonding hypothesis as these firms do not benefit from greater investor protection.

Lel and Miller (2008) follows a different approach and tests the bonding hypothesis by the firm's ability to identify and terminate poorly performing CEO's. Lel and Miller (2008) argues that it is difficult to measure the economic implications of cross-listing as most cross-listing theories have similar economic predictions. This study is different in the sense that it measures a direct outcome of corporate governance which is its ability to identify and replace poorly performing CEO's. Results show that cross-listed firms which originate from countries where investor protection is weak are more likely to terminate poorly performing CEO's compared to non-cross-listed firms. This is in line with the notion that cross-listing increases investor protection and higher governance standards. Additionally, the governance effects are stronger for firms on major US exchanges were stronger investor protection is the norm.

Previous section shows that there is theoretical and empirical evidence which supports the bonding hypothesis. However, Coffee (1998) also acknowledges that there is also criticism on the bonding hypothesis. Siegel (2005) finds in his research that in spite of more strict disclosure requirements under US GAAP, only a few SEC enforcement actions were taken

place against foreign firms which did not abide to the disclosure requirements. Numerous Mexican firms had the opportunity to successfully exploit the weak legal enforcement of the SEC at the cost of stakeholders. Additionally, Licht (2003) claims that the bonding effect to a more strict disclosure environment is overstated. According to Licht (2003), the primary reason for firms to cross-list is to gain access to cheaper capital or to enhance visibility of the firm to other potential investors. To adhere to more strict disclosure standards is a burden for the firm as it increases the auditing costs to comply to those standards. Therefore Licht (2003) argues that the more strict disclosure standards are a cost in the decision to cross-list.

The view that compliance to higher disclosure standards is more seen as a cost is shared by Bancel and Mittoo (2001). They find that managers view the most important benefits of cross-listing as the increase in visibility on the market and the ability to attract new potential investors. Additionally, the increase in compliance requirements are seen as the respective costs the firm has to pay. When it comes to the decision for firms to cross-list, both Coffee (1998) and Stulz (1999) mention that there is a self-selection problem in the sense that firms which decide to cross-list have different characteristics compared to firms which do not cross-list. Indeed, Doidge et al. (2004) find that firms which decide to cross-list have higher growth prospects compared to firms which do not cross-list. The studies imply that the decision to cross-list depends on other factors then the bonding effect. But Coffee (2002) argues that this does not rule out the bonding effect as both higher growth potential and bonding are not mutually exclusive. High growth firms may need an inflow of new capital and can use cross-listing to obtain capital at a lower rate and thus the bonding effect can still occur.

Previous sections have shown that there is a large body of empirical research which support the numerous arguments why firms decide to cross-list. A gross part of the literature is supporting the legal bonding hypothesis, which is the notion to adhere to higher disclosure requirements in order to increase corporate governance. However, several research support the view that the decision to cross-list is driven by the need to gain capital at a lower rate and signal their availability to investors. The requirement to adhere to higher disclosure requirement is then more seen as a cost rather than a reason to cross-list. Karolyi (2006) mentions that it is possible that firms have multiple motives to cross-list as these both arguments do not

necessarily exclude the other. Additionally, the motives to cross-list can vary over periods of time.

2.5 The relation between Cross-listing and Earnings Quality

This section will cover the literature on the relation between earnings quality and cross-listing. Specifically, the focus will be on the earnings persistence property of earnings quality where the ability to forecast earnings is being assessed. Lang et al. (2003a) investigates the relation between US cross-listing and the information environment of non-US firms. In comparison to non-cross-listed firms, cross-listed firms have increased disclosure quality as the ADR level 2 and 3 programs require that the disclosure must comply to SEC regulations and that accounts must reconcile to US GAAP. The researchers find that cross-listed firms in the US show greater analyst coverage and an increase in forecast accuracy of earnings compared to firms which are not cross-listed. A time-series analysis shows that the change in analyst coverage and forecast accuracy take place at the moment of cross-listing. Furthermore, the changes in firm value which happens at the moment of cross-listing is correlated with forecast accuracy and analyst following which imply that cross-listing has a positive effect on the value of the firm due to the increase in the firm's information environment. Their results are in line with the hypothesis that cross-listed firms have better information environments which leads to higher earnings quality.

Lang et al. (2003b) studies the accounting quality of US cross-listed firms compared to non-cross-listed firms. The researchers find evidence that cross-listed firms have higher accounting quality. Cross-listed firms differ in terms of the time-series properties of earnings and accruals. Furthermore, cross-listed firms differ in the degree of association between share prices and accounting data. Results show that cross-listed firms are less aggressive in terms of earnings management where this is proxied by measures of earnings smoothing and the frequency of small positive earnings. Additionally, cross-listed firms report earnings which are more conservative, which takes bad news into account in a more timely manner compared to good news. Lang et al. (2003b) find that the change in results partially appear from

differences in accounting quality pre-cross-listing and partially appear from differences post-cross-listing suggesting that disclosures which adhere to US GAAP show higher accounting quality.

Bozzolan et al. (2009) investigate the effects of future-oriented financial reporting in more detail. Their study is based on a sample of German, French, Italian and Swiss companies that are cross-listed on the New York Stock Exchange. The authors find that 20-F reports presented in the USA contain significantly more future-oriented information than the companies' domestic annual reports. Additionally, they find that increased disclosure of future-oriented information increases the accuracy of forecasts. While additional future oriented information generally increases the dispersion of EPS forecasts, an increase in verifiable (i.e. quantified and directed) forward-looking information contained in the 20-F reports decreases it. The results are in line with the notion that cross-listing increases the accounting quality of disclosures.

Lang et al. (2006) compares earnings of US firms with earnings from cross-listed non-US firms. The results show that the earnings of the cross-listed non-US firms are of lower quality compared to the US firms. The earnings of cross-listed firms exhibit higher earnings smoothing and are less conservative. Moreover, the earnings are less associated with the share price and have a greater tendency to be managed a towards a target. More specifically, firms which originate from countries with weak investor protection show more evidence of earnings management. This implies that the high disclosure standards of US GAAP enforced by the SEC do not necessarily result in higher accounting quality. US GAAP reported disclosures are influenced by the local reporting and regulatory environment. The results highlight that nominally similar accounting requirements do not necessary lead to comparable accounting data and that underlying institutional differences are important. While the study finds evidence that cross-listed non-US firms have lower earnings quality compared to US firms, we cannot conclude that the effect of cross-listing on earnings quality is non-existent. We note that the sample data does not include non-cross-listed firms which originate outside the US. It is still possible that of the non-US firms, the cross-listed firms exhibit higher earnings quality compared to non-cross-listed firms. No direct comparison is made between these two groups. As

such, no inference can be made on the direct effect of cross-listing on earnings quality.

The previous studies investigated the direct relation between cross-listing and earnings quality. We expand on this by mentioning an additional accounting study which researches the relation between financial reporting enforcement and earnings quality. Our reasoning with regards to the relevance of reporting enforcement, is that US cross-listing are subject to the more stringent and legal requirements by the SEC (Coffee, 1998; Stulz, 1999; Lel & Miller, 2008). Section 2.4.3 describes this in detail. Therefore, it is possible to deduce the relation between cross-listing and earnings quality by investigating the indirect relation between reporting enforcement and earnings quality. Hope (2003) investigates the relation between the level of reported annual disclosures and the accuracy of earnings forecasts. Results suggest, whilst controlling for firm and country-level factors, that reported disclosure level is positively associated with earnings forecast accuracy. This suggests that firm-level disclosures are highly indicative for investors to assess future earnings. Additionally, Hope (2003) researches the relation between the degree of enforcement of the accounting standards and earnings forecasts. The hypothesis states that a high level of accounting standard enforcement is positively related with earnings forecasts. When enforcement is stronger, managers are more inclined to follow prescribed accounting and disclosure rules to avoid the risk of being reprimanded. Proxies for accounting standard enforcement include audit spending, insider trade laws and shareholder protection. Results suggest that accounting enforcement is positively associated with forecast accuracy. This is consistent with the idea that manager's are inclined to follow prescribed reporting procedures and decreases accounting uncertainty.

3 Research Design

3.1 Introduction

The following section describes the research design which is used to gain an answer to the main research question: "is the earnings quality of disclosures higher for cross-listed firms compared to non-cross-listed firms?" Section 3.2 covers the hypothesis formulation where we

use the previous discussed theoretical framework to formulate concrete hypotheses. Section 3.3 describes the models used in order to test these hypothesis. Section 3.4 covers the sample selection in this thesis.

3.2 Hypothesis Formulation

Based on the information of section 2.4.3 we believe that the earnings quality of disclosures of cross-listed firms is increased due to the more strict reporting requirements of US GAAP and the higher level of financial reporting enforcement imposed by the SEC. Cross-listed firms have to adhere to more stringent legal and regulatory requirements which improves accounting disclosure accuracy and increases the assurance to stakeholders that the disclosures more accurately describe the economic reality of the firm. Section 2.5 describes prior research on the relation between earnings quality and cross-listing. Accounting literature finds a positive relation between earnings persistence and cross-listing. Therefore, we expect that cross-listed firm have improved earnings quality in terms of earnings persistence. We construct the following hypothesis:

Hypothesis 1 *The earnings persistence of cross-listed firms is higher than non-cross-listed firms.*

The instrumental paper of Sloan (1996) decomposes the earnings into a cash flow component and an accrual component and finds that the cash flow component is more persistent than the accrual component. We expand on this subject by applying the same framework as Sloan (1996) to test if we find the same results. Furthermore, we analyze the effect of cross-listing on the two earnings components. We expect that the cross-listing effect does not have homogeneous effects on the two components in the sense that the cross-listing effect can have a bigger impact on one component compared to the other. We expect that the cross-listing effect has a bigger influence on the accrual component compared to the cross-listing effect on the cash flow component. The accrual component is more discretionary by nature and is therefore more susceptible to distortions. This is due to the fact that determining the accrual component requires a high degree of subjectivity compared to the cash flow component of

earnings. We have explored in section 2.5 that cross-listed firms have to adhere to the higher levels of regulatory requirements of US GAAP which improves accounting quality as a result. Our expectation is that the higher accounting quality due to cross-listing will have a bigger impact on the information content of the accrual component as the higher accounting standards will mitigate the inaccuracies caused by subjective judgments. We state the following hypotheses:

Hypothesis 2a *the cash flow component of earnings is more persistent than the accrual component of earnings.*

Hypothesis 2b *The accrual component of earnings is more persistent than the cash flow component of earnings, when we only consider the additional effect of cross-listing.*

Dechow et al. (2008) further decomposes the cash flow component of earnings in to the components of DIST_D, DIST_E and ΔCASH which represents the distribution to debt holders, distribution to equity holders and changes in cash equivalents, respectively. As mentioned in section 2.3.2, Dechow et al. (2008) predicts that the cash flow component that is distributed to equity holders is more persistent than the cash flow component that is distributed to debt holders. When cash distributions are positive and are likely to persist in the future, managers are more inclined to repay equity holders as equity expenditures are more discretionary by nature in order to signal the future prospects of the firm (Dechow et al., 2008). And when cash distributions are negative and the firm needs financing, the firm is more likely to use equity financing as equity holders are able to better withstand the risk of default and financial distress.

Following the reasoning of Dechow et al. (2008), we predict that the cash distribution to equity holders has higher persistence. Additionally, we also test if the same results holds when we add the effect of cross-listing. We argue that the effect of cross-listing has a dampening effect on the more discretionary nature of the cash distributions to equity holders. According to Doidge et al. (2004), firms cross-list to willingly commit to higher levels of control and scrutiny which in turn leads to a higher level of minority shareholder protection. This limits the expropriation of minority stakeholders by controlling stakeholders and increases the

resources available for the firm as less is distributed to controlling stakeholders. The increase in resources of the firm can then be spend on growth opportunities in order to increase the value of the firm. O'Connor (2006) finds that firms pay lower dividends after cross-listing presumably because shareholders settle for lower dividend payouts in exchange for higher investor protection.

Based on the previous literature, we expect the following dynamics to happen for cross-listed firms. Assuming that dividend is primarily distributed when the economic situation of the firm is satisfactory (earnings are positive), less capital is distributed to equity holders as they settle for lower dividend payouts in exchange for higher investor protection. Thus the distribution to equity has weaker implications for earnings persistence in positive earnings situations. As a result of less capital spent to equity holders, more cash is retained in the firm. When the economic outlook of the firm is unsatisfactory (earnings are negative) and requires financing, less is required to finance from equity holders as the retained cash acts as buffer for the earnings shortfall. This implicates that in negative earnings situations, the financing from equity becomes less persistent. In both profit and loss situations (positive and negative earnings), the distribution (and financing) to (from) equity holders becomes less persistent. While we think that the cross-listing effect on the persistence of the distribution to equity holders is positive, the above discussion suggests that the persistence will not be as strong. We therefore expect that the persistence of the distribution to equity holders will be equal to the persistence of the distribution to debt holders when we consider the additional effect of cross-listing. We state the following hypotheses:

Hypothesis 3a *The cash component which is distributed to equity holders is more persistent than the cash component which is distributed to debt holders.*

Hypothesis 3b *The cash component which is distributed to equity holders is not more persistent than the cash component which is distributed to debt holders, when we only consider the additional effect of cross-listing.*

3.3 Model Applications

This section will describe how the models used in this thesis are constructed and applied. Section 2.3 has discussed the relevant models regarding earnings persistence as well as the relevant accounting literature related to these model. This thesis will measure earnings persistence from five models: (1) A standard first-order autoregressive model, (2) the model of Sloan (1996), (3) the model of Dechow et al. (2008), (4) the model of Hou et al. (2012) and (5) the model of Li and Mohanram (2014).

3.3.1 AR(1) model without Earnings Decomposition

The standard AR(1) model in this context is the first-order autoregressive model which regresses present *Earnings* on lagged *Earnings* without decomposing earnings into smaller components such as accruals and cash flows. We include the effect of cross-listing by introducing a dummy variable for cross-listed firms. The model is specified as follows:

$$EARNINGS_{t+1} = \beta_0 + \beta_1 EARNINGS_t + \beta_2 CL + \beta_3 CL \times EARNINGS_t + \varepsilon_{t+1} \quad (6)$$

where $EARNINGS_t$ is income before extraordinary items (COMPUSTAT item IB) which is deflated by total average assets. CL is a dummy variable which takes on a value of one if the firm is cross-listed and value zero if the firm is non-cross-listed. The aforementioned variable construction uses the balance sheet method. We also compute the variables using the statement of cash flows as mentioned in Ndubizu and Sallehu (2017). Table 1 on page 35 presents the variable construction via both the balance sheet method and the calculation method.

In the AR(1) model above β_3 is the magnitude of the cross-listing effect on earnings persistence and we expect this parameter to be positive according to hypothesis **H1**.

3.3.2 Sloan (1996)

The model used by Sloan (1996) has been briefly explained in section 2.4.1 and is displayed in equation (2). Sloan (1996) decomposes earnings into the components accruals and cash flows in order to measure the effect of each individual component on future earnings. We apply the same model on our research and accommodate for the fact that we want to include the cross-listing effect. We again add the dummy variable CL and the model is specified as follows:

$$\begin{aligned} EARNINGS_{t+1} = \beta_0 + \beta_1 ACCRUALS_t + \beta_2 FCF_t \\ + \beta_3 CL + \beta_4 CL \times ACCRUALS_t + \beta_5 CL \times FCF_t + \varepsilon_{t+1} \end{aligned} \tag{7}$$

where $EARNINGS_t$ is income before extraordinary items (COMPUSTAT item IB) deflated by total average assets, $ACCRUALS_t$ is the difference between the change in non-cash assets and change in non-debt (operating) liabilities scaled by total average assets. We use the same computation method as Sloan (1996) to determine our $ACCRUALS_t$ variable. The variable names mnemonics as found on the COMPUSTAT database are mentioned between parenthesis. The change in non-cash assets is calculated by the difference from the change in total assets (ΔAT) and the change in cash and cash equivalents (ΔCHE). Afterwards, we calculate the change in non-debt liabilities by subtracting change in total liabilities (ΔLT) with the change in total debt in current liabilities (ΔDLC) and the change in long-term debt (ΔDLTT). The end formula is thus [(ΔAT - ΔCHE) - (ΔLT - ΔDLC - ΔDLTT)] and corresponds with the calculation method in both Sloan (1996) and Ndubizu and Sallehu (2017). FCF_t is $EARNINGS_t$ less $ACCRUALS_t$. CL is a dummy variable which takes on a value of one if the firm is cross-listed and takes zero if the firm is non-cross-listed. The aforementioned variable construction uses the balance sheet method. We also compute the variables using the statement of cash flows as mentioned in Ndubizu and Sallehu (2017). Table 1 on page 35 presents the variable construction via both the balance sheet method and the calculation method.

Hypothesis **H2a** states that the cash flow component of earnings is more persistent than the accrual component of earnings such that we expect that $\beta_2 > \beta_1$. We test this hypothesis with and without the CL interaction terms. Additionally, we also consider the effect of cross-listing on the persistence of both individual earnings components as stated in Hypothesis **H2b**. We expect that the cross-listing effect leads to a bigger increase in the persistence of accrual component compared to the cash flow component such that $\beta_4 > \beta_5$.

3.3.3 Dechow et al. (2008)

As the cash flow component of earnings is more persistent than the accrual component of earnings, one would like to gain more insight in what exactly drives the change in earnings via the cash flow component. Dechow et al. (2008) further decomposes the cash flow component of earnings into three more components: change in retained cash, distribution to debt holders, and distribution to equity holders. We follow the approach as mentioned in Dechow et al. (2008) and Ndubizu and Sallehu (2017) in order to derive the expression of the cash flow component of earnings into the three smaller parts. We start with the accruals-based balance sheet identity:

$$Total\ Assets = Total\ Liabilities + Owners'\ Equity \tag{8}$$

We then distinguish between operating assets (liabilities) and financial assets (liabilities) by including cash (debt) as the most common financial asset (liability) and we get the following expression:

$$Cash\ +\ Operating\ Assets = Debt\ + Operating\ Liabilities\ + Owners'\ Equity \tag{9}$$

Defining Net operating assets (NOA) as the difference between operating assets and operating liabilities, expressing Owner's Equity as EQUITY, taking differences and rearranging terms

we get:

$$\Delta NOA = \Delta DEBT + \Delta EQUITY - \Delta CASH \tag{10}$$

Next, we assume standard clean surplus assumptions for changes in equity and debt (Dechow et al., 2008) where the following holds:

$$\Delta EQUITY = INCOME \; - \; DIST\_E \tag{11}$$

$$\Delta DEBT = Interest\ Expense \; - \; Interest\ Paid \; - \; DIST\_D \tag{12}$$

Where *INCOME* stands for net income, *DIST_E* stands for net cash distribution to equity holders and *DIST_D* stands for net cash distribution to debt holders. Using equations (10), (11) and (12) and rearranging terms we get our final expression:

$$INCOME \; - \; ACCRUALS = DIST\_D \; + \; DIST\_E \; + \; \Delta CASH \tag{13}$$

The left hand side *INCOME* - *ACCRUALS* is our definition of free cash flows and we have managed to express this into three other components. *DIST_D* and *DIST_E* refer to distributions to debt holders and equity holders respectively. And $\Delta CASH$ refers to change in retained cash. Having found this expression for the free cash flows we can regress earnings on its individual components. We then obtain the model of Dechow et al. (2008) in equation 3. We apply the effect of cross-listing in the model by including the dummy CL. The model becomes as follows:

$$\begin{aligned} EARNINGS_{t+1} = {} & \beta_0 + \beta_1\, ACCRUALS_1 \; + \; \beta_2\, \Delta CASH_t \; + \; \beta_3\, DIST\_D_t \; + \; \beta_4\, DIST\_E_t \\ & + \; \beta_5\, CL \; + \; \beta_6\, CL \times ACCRUALS_t \; + \; \beta_7\, CL \times \Delta CASH_t \\ & + \; \beta_8\, CL \times DIST\_D_t \; + \; \beta_9\, CL \times DIST\_E_t \; + \; \varepsilon_{t+1} \end{aligned} \tag{14}$$

where ACCRUALS is calculated as mentioned in Sloan (1996) and explained in section 3.3.2. $\Delta CASH$ is the change in retained cash (ΔCHE), $DIST\_D$ is the net distribution to debt holders (-1 $\times$ [ΔDLC + ΔDLTT]). $DIST\_E$ is the net distribution to equity holders calculated as (-1 $\times$ [ΔAT - ΔLT - IB]). The variable names mnemonics as found on the COMPUSTAT database are mentioned between parenthesis. $DIST\_D$ and $DIST\_e$ are multiplied with -1 to ensure that positive (negative) numbers represent distributing (financing). All the variables are scaled by total average assets. CL is a dummy variable which takes on a value of one if the firm is cross-listed and takes zero if the firm is non-cross-listed. The aforementioned variable construction uses the balance sheet method. We also compute the variables using the statement of cash flows as mentioned in Ndubizu and Sallehu (2017). Table 1 on 35 presents the variable construction via both the balance sheet method and the calculation method.

According to hypothesis **H3a**, we expect that the cash component which is distributed to equity holders is more persistent, such that $\beta_4 > \beta_3$. When we only evaluate the effect of cross-listing we expect that the cash component which is distributed to equity holders has equal persistence compared to the cash component which is distributed to debt holders. We evaluate hypothesis **H3b** by checking if $\beta_7 = \beta_8$.

3.3.4 Hou et al. (2012)

An introduction to the model of Hou et al. (2012) has been given in section 2.3.3 where the respective model was given in equation (4). We adjust the model for the presence of cross-listed firms by adding a dummy variable. The model is as follows:

$$\begin{aligned} EARNINGS_{t+1} = {} & \beta_0 + \beta_1\, ASSETS_t + \beta_2\, DIV_t + \beta_3\, DD_t + \beta_4\, EARNINGS_t + \beta_5\, Neg\_E_t \\ & + \beta_6\, ACCRUALS_t + \beta_7\, CL + \beta_8\, CL \times ASSETS_t + \beta_9\, CL \times DIV_t \\ & + \beta_{10}\, CL \times DD_t + \beta_{11}\, CL \times EARNINGS_t + \beta_{12}\, CL \times Neg\_E_t \\ & + \beta_{13}\, CL \times ACCRUALS_t + \varepsilon_{t+1} \end{aligned} \tag{15}$$

Where $EARNINGS_t$ denotes the earnings in year t, $ASSETS_t$ are the total assets, DIV_t are the dividend payments, DD_t is a dummy variable which equals 1 if the firm has dividend payers, Neg_E_t is a dummy variables which equals 1 if the firm has negative earnings, $ACCRUALS_t$ are the accruals, and CL is a dummy variable which equal 1 if the firm is a cross-listed firm. Hou et al. (2012) estimates the above mentioned regression using the previous ten years of data. However, we perform the regression on our whole sample in order to make results comparable with the other models.

We expect that cross-listed firms have to adhere to the more stringent and legal requirements imposed by the SEC which improves the earnings persistence in financial disclosures. Related to hypothesis **H1**, we predict that cross-listed firms exhibit higher earnings persistence such that the coefficients of β_{11} ($CL \times EARNINGS_t$) is positive.

3.3.5 Li & Mohanram (2014)

Section 2.3.4 describes the model of Li and Mohanram (2014) where the respective model was given in equation (5). We again adjust the model to include the effect of cross-listing. We get the following model:

$$\begin{aligned} EARNINGS_{t+1} = \beta_0 + \beta_1\, EARNINGS_t + \beta_2\, CL + \beta_3\, CL \times EARNINGS_t \\ + \beta_4\, NegE_t + \beta_5\, NegE_t \times EARNINGS_t + \beta_6\, NegE_t \times CL \\ + \beta_7\, NegE_t \times CL \times EARNINGS_t + \varepsilon_{t+1} \end{aligned} \tag{16}$$

Where $NegE_t$ is a dummy variable which takes on a value of 1 if the respective earnings numbers is negative and zero otherwise. CL is a dummy variable which equals 1 if the firms is cross-listed. We note that additional cross-term have been added between the two dummy variables.

This model allows for different persistence levels in both profit and loss situations (positive or negative earnings). Therefore, we also test **H1** in both directions. The additional effect of cross-listing on earnings persistence in a situation with positive earnings is measured by

β_3 ($CL \times EARNINGS_t$). The additional effect of cross-listing on earnings persistence in a situation with negative earnings is measured by β_7 ($NegE_t \times CL \times EARNINGS_t$).

3.4 Sample and Variables

The sample data is collected using the Orbis and Bloomberg databases and consists of 242 firms. Half of those firms (121 firms) are cross-listed firms which originate from outside the US and are cross-listed on a US stock exchange. The firms are listed on at least one major US stock exchange which are NASDAQ, AMEX and NYSE. These firms are subject to the ADR level 2 and 3 programs which call for more strict requirements as reported disclosures should adhere to US GAAP. The other half (also 121 firms) consists of non-cross-listed firms which are only listed on their local stock exchanges. Data is collected on a yearly basis and the time period spans from 2001 to 2016. This leads to a total of 3872 firm-year observations.

A proper research is done by using a control group and a treatment group where the treatment group is exposed to a certain treatment which, in the case of our thesis, is cross-listing. The difference in the outcome of the analysis between the two groups can then be fully attributed to cross-listing. But, one has to ensure that both groups consists of firms with comparable characteristics. This is to ensure that the difference in outcomes of the analysis between the two groups can be fully attributed to the effect of cross-listing and not some other firm characteristic. Retrieving a list of all cross-listed firms on US stock exchanges can be relatively easy obtained from the Orbis database. However, obtaining a firm list of comparable non-cross-listed firms is a greater obstacle as it is not immediately clear which firms are appropriate. It is unwise to select all non-cross-listed firms in the world as it is apparent that cross-listed firms have specific firm characteristics. Analysis has shown that cross-listed firms tend to be much larger in size in terms of total assets and have far greater earnings. Comparing big firms with small firms is inappropriate as the different firm dynamics in big firms can severely skew research results. Therefore, we require a comparable non-cross-listed firm sample which have similar firm characteristics. For each cross-listed firm we manually pair a comparable non-cross-listed firm based on country of origin, industry

and total size. Applying more filters would heavily reduce the total sample size. Collecting a comparable firm sample has been an manual intensive endeavor as we had to individually pair each cross-listed firm. We use Bloomberg to manually search for comparable non-cross-listed firms based on the criteria.

Country of origin is selected as a selection criteria because each country has their own legal and regulatory requirements. To solely measure the effect of cross-listing on US stock exchanges, the cross-listed and non-cross-listed firm should originate from the same country. Another characteristic which is used is industry. The Global Industry Classification Standard (GICS) is an industry classification system consisting of four-tiers which classifies firm in (descending order based on size) (1) sectors, (2) industry groups, (3) industries and (4) sub-industries. The sample used for this thesis are paired on the industry level. Industry is used as characteristic as each different industry group has their own set of general accepted accounting rules which influences disclosures. The last characteristic which is used to pair the samples is firm size which is proxied by total assets. For the firm size characteristic, a non-cross-listed sample is only deemed appropriate if the total asset value is within the threshold of total assets $\pm$ 30%. If no appropriate match can be found between a cross-listed firm and a non-cross-listed firm, then the cross-listed firm is discarded from the sample.

Table 1 provides an overview how the variables of our models are constructed. The data series are collected from the COMPUSTAT database. However, certain series are not available for non-US firms and instead we use Thomson Datastream to obtain them. For these incomplete series, we use the values from Thomson Datastream for the whole sample for the sake of consistency. We follow the variable construction of Ndubizu and Sallehu (2017) which are relevant for the AR(1) model, the model of Sloan (1996) and the model of Dechow et al. (2008). The variable construction mentioned in the previous section uses the balance sheet method which is also the method how prior research has defined the variables. However, Ndubizu and Sallehu (2017) also constructs the variables using the statements of cash flows and finds similar results when compared to the variables constructed via the balance sheet method. Therefore, we also construct the variables using the statements of cash flows in addition to the balance sheet method to see if results are robust. All variables are winsorized

at the 5th and 95th percent levels to mitigate the effect of extreme outliers. This means that observation values which are smaller (greater) than the 5th (95th) percentile are set equal to the value at those percentiles.

Table 1: Variable construction

	Balance Sheet Variables	Cash Flow Statement Variables
$EARNINGS_t$	ib	ibc
$ACCRUALS_t$	(Δat - Δche) - (Δlt - Δdlc - Δdltt)	ibc - oancf - ivncf
FCF_t	$EARNINGS_t$ - $ACCRUALS_t$	$EARNINGS_t$ - $ACCRUALS_t$
$\Delta CASH_t$	Δche	chech
$DIST_t$	-1 × ((Δdlc + Δdltt) + (Δat + Δlt + ib))	-1 × fincf
$DIST\_D_t$	-1 × (Δdlc + Δdltt)	-1 × (fincf - $DIST\_E_t$)
$DIST\_E_t$	-1 × (Δat - Δlt - ib)	-1 × (sstk - prstkc - dv)
$ASSETS_t$	at	
DIV_t		dvc
LEV_t	(dlc + dltt)/at	
ROA_t	nicon/at	
MB_t	**MTBV**	
$SIZE_t$	log(at)	

This table presents the variable construction using data from COMPUSTAT and Thomson Datastream. Lower case letters are the variable names (in mnemonics) as reported on the COMPUSTAT database. Letters in bold are the variable names (in mnemonics) as reported on Thomson Datastream. All variables are scaled by average total assets. The left part of the table computes the variables using the balance sheet method. The right part of the table computes the variables using the statements of cash flows as mentioned in Ndubizu and Sallehu (2017). $DIST_t$, $DIST\_D_t$ and $DIST\_E_t$ are multiplied by -1 so that positive (negative) numbers represent distributing (financing).Δ represents first differences, i.e., Δche = che_t - che_{t-1}.

4 Results

This section will present the empirical results which are derived from the research design provided in the previous section. Section 4.1 will describe the descriptive statistics of the variables used in our research. Section 4.2 provides an analysis of the correlations between the variables. Section 4.3 presents the main results while section 4.4 will present the results when we add further control variables to test for robustness. Section 4.5 will conclude our

findings.

4.1 Descriptive Statistics

Table 2 presents the descriptive statistics of the variables used in our research. The table displays the mean, standard deviation, the median and the quantiles. The mean and maximum values of their respective variables are also displayed. Furthermore, the skewness, kurtosis and the Jarque-Bera test are presented which are calculated statistics which describe the distribution of the variables. The table consists of three panels where panel A consists of all the firms in the sample. Panel B only contains the firms which are cross-listed (CL firms) and Panel C only contains the firms which are not cross-listed (NCL firms). The variables are constructed using COMPUSTAT data and we refer back to table 1 on page 35 on how these variables are calculated. The variables presented on table 2 are calculated using the balance sheet method. We do not present the descriptive statistics of the variables which are calculated via the cash flow statement here but they are presented in Appendix B. The findings between the two calculation methods are similar. Note that the variables are winsorized at the 5th and 95th levels of the whole sample which results in equal minimum and maximum values of the variables between the two different samples.

We first observe that the mean of $EARNINGS_t$ are positive for the whole sample and that the $EARNINGS_t$ of cross-listed firms are almost twice as high than the $EARNINGS_t$ of non-cross-listed firms with means of 0.052 and 0.026 respectively. These numbers are higher than the values stated by Dechow et al. (2008) and Ndubizu and Sallehu (2017) who find means of -0.016 and -0.001 respectively. However, their standard deviations are high (0.221 and 0.200, respectively) and their sample period is different. However, Hou et al. (2012) does present a positive mean for $EARNINGS_t$ in their sample.

$ACCRUALS_t$ and $\Delta CASH_t$ are positive for both cross-listed and non-cross listed firms. This is in line with the finding of Dechow et al. (2008) and Ndubizu and Sallehu (2017) and indicates that the firms are growing in size by retaining earnings. We observe that the $ACCRUALS_t$ of cross-listed firms are higher than their non-cross-listed counter part with

Table 2: Descriptive Statistics

Panel A: All Firms (n = 242)									
Variables	Minimum	Maximum	Mean	Std. Dev	Q1	median	Q3	Skewness	Kurtosis
$Earnings_t$	−0.124	0.155	0.039	0.066	0.011	0.040	0.079	−0.572	3.498
$Accruals_t$	−0.355	0.295	0.018	0.136	−0.032	0.021	0.076	−0.605	4.616
FCF_t	−0.418	0.511	0.021	0.138	−0.038	0.019	0.081	0.285	5.075
$\Delta CASH_t$	−0.166	0.128	0.013	0.065	−0.020	0.005	0.034	−0.584	3.989
$DIST_t$	−0.340	0.333	0.007	0.140	−0.048	0.013	0.067	−0.230	4.215
$DIST\_D_t$	−0.179	0.183	−0.006	0.080	−0.041	0.001	0.025	0.092	3.765
$DIST\_E_t$	−0.238	0.293	0.018	0.104	−0.011	0.014	0.049	0.169	5.121
$ASSETS_t$	0.900	1.199	1.031	0.071	0.989	1.023	1.065	0.528	3.274
DIV_t	0.000	0.072	0.022	0.020	0.007	0.016	0.030	1.169	3.591
ROA_t	−0.134	0.155	0.037	0.068	0.010	0.040	0.079	−0.654	3.582
LEV_t	0.000	0.551	0.228	0.159	0.101	0.215	0.342	0.309	2.206
MB_t	0.410	7.813	2.424	1.906	1.078	1.790	3.130	1.462	4.541
$SIZE_t$	4.470	16.309	10.476	3.100	8.410	10.462	12.546	−0.021	2.490
Panel B: Only Cross-listed Firms (n = 121)									
Variables	Minimum	Maximum	Mean	Std. Dev	Q1	median	Q3	Skewness	Kurtosis
$Earnings_t$	−0.124	0.155	0.052	0.057	0.023	0.050	0.086	−0.568	4.136
$Accruals_t$	−0.355	0.295	0.022	0.125	−0.023	0.025	0.077	−0.730	5.446
FCF_t	−0.367	0.511	0.030	0.127	−0.025	0.026	0.080	0.557	5.829
$\Delta CASH_t$	−0.166	0.128	0.011	0.059	−0.020	0.005	0.031	−0.622	4.596
$DIST_t$	−0.340	0.333	0.018	0.129	−0.035	0.019	0.072	−0.161	4.802
$DIST\_D_t$	−0.179	0.183	−0.010	0.073	−0.038	−0.001	0.023	0.120	4.153
$DIST\_E_t$	−0.238	0.293	0.029	0.096	−0.005	0.020	0.057	0.327	5.674
$ASSETS_t$	0.900	1.199	1.042	0.059	0.994	1.034	1.064	0.647	4.120
DIV_t	0.000	0.072	0.025	0.020	0.010	0.019	0.035	1.024	3.155
ROA_t	−0.134	0.155	0.056	0.052	0.023	0.050	0.085	−0.385	4.563
LEV_t	0.000	0.551	0.211	0.150	0.114	0.201	0.335	0.389	2.382
MB_t	0.410	7.813	2.553	1.907	1.140	1.790	3.085	1.542	4.637
$SIZE_t$	6.239	16.309	12.153	2.533	9.718	11.730	12.983	0.226	2.108
Panel C: Only Non-cross-listed Firms (n = 121)									
Variables	Minimum	Maximum	Mean	Std. Dev	Q1	median	Q3	Skewness	Kurtosis
$Earnings_t$	−0.124	0.155	0.026	0.071	0.001	0.030	0.065	−0.422	2.988
$Accruals_t$	−0.355	0.295	0.014	0.146	−0.039	0.015	0.084	−0.497	4.008
FCF_t	−0.418	0.511	0.012	0.147	−0.054	0.014	0.082	0.158	4.472
$\Delta CASH_t$	−0.166	0.128	0.015	0.070	−0.024	0.004	0.039	−0.539	3.502
$DIST_t$	−0.340	0.333	−0.005	0.150	−0.062	0.007	0.063	−0.214	3.742
$DIST\_D_t$	−0.179	0.183	−0.011	0.085	−0.043	0.002	0.028	0.074	3.427
$DIST\_E_t$	−0.238	0.293	0.008	0.110	−0.017	0.007	0.040	0.135	4.697
$ASSETS_t$	0.900	1.199	1.036	0.070	0.982	1.025	1.068	0.557	3.156
DIV_t	0.000	0.072	0.018	0.019	0.003	0.012	0.025	1.403	4.417
ROA_t	−0.134	0.155	0.043	0.053	−0.005	0.038	0.067	−0.345	4.774
LEV_t	0.000	0.551	0.218	0.169	0.082	0.206	0.348	0.372	2.131
MB_t	0.410	7.813	2.175	1.897	0.950	2.040	3.178	1.270	4.011
$SIZE_t$	4.470	16.309	10.199	3.282	6.849	10.166	11.429	−0.040	2.097

All variables are scaled by average total assets and are winsorized at the 5th and 95 percent levels.

mean values of 0.022 and 0.014 respectively. The same applies to FCF as cross-listed firms have a mean of 0.030 whilst non-cross-listed firms have a mean of 0.012.

When we look at the means of $DIST_t$, $DIST\_D_t$ and $DIST\_E_t$ variables we observe notable differences between the two samples. $DIST_t$ is positive for cross-listed firms with a value of 0.018 which suggest that the firms distribute on average more capital than they raise capital. More specifically, $DIST\_D_t$ is negative with -0.010 and $DIST\_E_t$ is largely positive with 0.029 which suggests that cross-listed firms raise capital from debt holders but the capital gain is offset by the large distribution of capital to equity holders. $DIST_t$ of non-cross-listed firms is -0.005 which means that they raise on average more capital than they distribute capital. $DIST\_D_t$ has a similar value of -0.011 compared to CL firms however $DIST\_E_t$ only has a value of 0.008 which suggests that NCL firms distribute a considerable amount less capital to equity holders than CL firms. Our findings are different then Dechow et al. (2008) and Ndubizu and Sallehu (2017) who report $DIST_t$ values of -0.086 and -0.098 respectively. Dechow et al. (2008) mentions however that the standard deviation of the three DIST values are high (0.180 up to 0.278) which indicates that each cash category can substantially differ in the variation of earnings. We observe these high standard deviations in our sample as well.

We observe that the cross-listed firms have distinct differences compared to non-cross-listed firms if we look at the firm characteristics. The mean of $SIZE_t$ for CL firms is 12.153 compared to the 10.199 for NCL firms. Additionally, ROA_t (0.056 for CL firms; 0.043 for NCL firms) and MB_t (2.553 for CL firms; 2.175 for NCL firms) indicate that cross-listed firms are more profitable and have higher growth opportunities.

The skewness and kurtosis parameters gives us information how the variables are distributed. While having a normal distribution is not a strict requirement for an OLS linear estimation, it does increase the consistency of the parameter estimation. A normal distribution has a skewness of zero and a kurtosis of 3. We observe that the variables have skewness values close to zero. Furthermore, the kurtosis values of the used variables are in the range of 3 to 5.7. We conclude that scaling the variables by total average assets and applying winsorisation afterwards results that the distribution of the variables approximates a normal distribution. We refer to Appendix A which display the histograms of the used variables.

4.2 Correlation Matrix

We are able to obtain relevant insight in the relationships between individual variables by looking at the correlation in detail. Table 14 presents the various correlations between our variables. The table is divided in three panels where panel A includes the whole sample, panel B which only consists of the cross-listed firms (CL firms) and panel C which only includes the non-cross-listed firms (NCL firms). The variables above the diagonal are the Pearson correlations while the values below the diagonal presents the Spearman correlations. In the interpretation below we will only discuss the Pearson correlations which are in the upper diagonal. We find similar results when we analyze the Spearman correlations.

The correlations between $EARNINGS_t$ and $ACCRUALS_t$ is 0.200 for the CL firms and 0.206 for the NCL firms. Whereas the correlation values between $EARNINGS_t$ and FCF_t are considerable higher with values 0.655 and 0.597 for CL firms and NCL firms respectively. This is in line with the notion that the cash component of earnings is more persistent with Earnings in comparison with the accrual component and therefore has higher co-movement with each other. Dechow et al. (2008) and Ndubizu and Sallehu (2017) report similar results where the correlations between Earnings and FCF are considerable higher than the correlations between Earnings and Accruals.

We observe a strong negative correlation between $ACCRUALS_t$ and FCF_t of around -0.8 for both samples. As noted in section 2.3.2 we decompose FCF_t into the components $\Delta CASH_t$ and $DIST_t$ (where $DIST_t$ can be further decomposed into $DIST\_D_t$ and $DIST\_E_t$). Looking at the correlations we observe that the strong negative correlation between $ACCRUALS_t$ and FCF_t is mainly attributable to $DIST_t$ with high negative correlation of -0.722 for the whole sample (-0.796 for CL firms; -0.614 for NCL firms). If we look at one level lower we find that the correlations of $DIST\_D_t$ are slightly more negative than $DIST\_E_t$ with -0.601 and -0.573 respectively. (-0.689 vs. -0.661 for CL firms; -0.525 vs. -0.359 for NCL firms). These correlation values corresponds with Dechow et al. (2008) and Ndubizu and Sallehu (2017) which report similar high negative values. Dechow et al. (2008) reports that the gains from debt financing are more likely to increase operating expenditures which are eventually capitalized

Table 3: Correlation Matrix

Panel A: All Firms (n = 242)	$Earnings_{t+1}$	$Earnings_t$	$Accruals_t$	FCF_t	$\Delta CASH_t$	$DIST_t$	$DIST\_D_t$	$DIST\_E_t$	$ASSETS_t$	DIV_t	ROA_t	LEV_t	MB_t	$SIZE_t$
$EARNINGS_{t+1}$		0.725	0.067	0.371	0.188	0.287	0.093	0.318	0.174	0.548	0.722	−0.265	0.330	−0.108
$EARNINGS_t$	0.754		0.217	0.564	0.159	0.254	0.053	0.275	0.272	0.644	0.995	−0.311	0.353	−0.103
$ACCRUALS_t$	0.087	0.205		−0.884	0.186	−0.722	−0.601	−0.573	0.667	−0.027	0.231	0.083	0.053	−0.020
FCF_t	0.358	0.515	−0.799		−0.108	0.835	0.619	0.698	−0.470	0.412	0.377	−0.265	0.162	−0.043
$\Delta CASH_t$	0.186	0.154	0.005	0.098		−0.465	−0.319	−0.435	0.398	0.056	0.168	−0.065	0.079	−0.027
$DIST_t$	0.274	0.291	−0.643	0.800	−0.335		0.691	0.815	−0.701	0.403	0.305	−0.255	0.120	−0.005
$DIST\_D_t$	0.097	0.065	−0.562	0.584	−0.219	0.688		0.258	−0.561	0.068	0.097	−0.281	−0.076	−0.010
$DIST\_E_t$	0.315	0.364	−0.387	0.584	−0.266	0.718	0.152		−0.418	0.510	0.338	−0.099	0.243	−0.021
$ASSETS_t$	0.194	0.267	0.645	−0.407	0.374	−0.651	−0.528	−0.376		0.004	0.277	0.009	0.160	−0.070
DIV_t	0.564	0.654	−0.003	0.394	0.033	0.425	0.094	0.529	−0.013		0.637	−0.278	0.374	−0.198
ROA_t	0.751	0.994	0.213	0.358	0.150	0.299	0.094	0.349	0.271	0.650		−0.314	0.350	−0.103
LEV_t	−0.261	−0.307	0.083	−0.268	−0.087	−0.235	−0.228	−0.142	−0.003	−0.302	−0.310		0.040	0.129
MB_t	0.344	0.386	0.073	0.162	0.075	0.123	−0.049	0.212	0.163	0.277	0.385	−0.023		−0.200
$SIZE_t$	−0.121	−0.127	−0.009	−0.059	−0.029	−0.040	−0.018	−0.056	−0.049	−0.176	−0.128	0.132	−0.159	
Panel B: Only Cross-listed Firms (n = 121)	$Earnings_{t+1}$	$Earnings_t$	$Accruals_t$	FCF_t	$\Delta CASH_t$	$DIST_t$	$DIST\_D_t$	$DIST\_E_t$	$ASSETS_t$	DIV_t	ROA_t	LEV_t	MB_t	$SIZE_t$
$EARNINGS_{t+1}$		0.757	0.095	0.383	0.206	0.280	0.038	0.350	0.215	0.550	0.755	−0.217	0.442	−0.090
$EARNINGS_t$	0.777		0.200	0.655	0.152	0.229	0.046	0.260	0.296	0.646	0.994	−0.246	0.462	−0.102
$ACCRUALS_t$	0.108	0.204		−0.896	0.247	−0.796	−0.689	−0.661	0.755	−0.031	0.245	0.061	0.013	0.029
FCF_t	0.377	0.515	−0.802		−0.175	0.889	0.701	0.770	−0.528	0.433	0.389	−0.211	0.276	−0.092
$\Delta CASH_t$	0.211	0.163	0.013	0.084		−0.468	−0.367	−0.446	0.385	0.055	0.172	−0.029	0.071	0.002
$DIST_t$	0.281	0.275	−0.689	0.843	−0.334		0.740	0.850	−0.717	0.411	0.303	−0.215	0.245	−0.080
$DIST\_D_t$	0.062	0.052	−0.604	0.631	−0.241	0.714		0.348	−0.597	0.014	0.013	−0.280	−0.056	−0.005
$DIST\_E_t$	0.340	0.337	−0.436	0.625	−0.274	0.731	0.182		−0.398	0.535	0.375	−0.045	0.385	−0.135
$ASSETS_t$	0.241	0.294	0.716	−0.446	0.384	−0.647	−0.560	−0.352		0.032	0.305	0.018	0.111	−0.017
DIV_t	0.580	0.676	−0.003	0.420	0.039	0.429	0.067	0.534	0.034		0.639	−0.180	0.489	−0.260
ROA_t	0.773	0.991	0.223	0.379	0.148	0.322	0.054	0.377	0.300	0.671		−0.249	0.462	−0.097
LEV_t	−0.210	−0.239	0.068	−0.223	−0.047	−0.212	−0.252	−0.079	−0.012	−0.197	−0.244		−0.027	−0.086
MB_t	0.445	0.496	0.078	0.213	0.058	0.208	−0.052	0.330	0.142	0.429	0.495	−0.066		−0.319
$SIZE_t$	−0.100	−0.117	0.041	−0.119	0.022	−0.137	−0.025	−0.146	0.030	−0.273	−0.112	−0.072	−0.266	
Panel C: Only Non-cross-listed Firms (n = 121)	$Earnings_{t+1}$	$Earnings_t$	$Accruals_t$	FCF_t	$\Delta CASH_t$	$DIST_t$	$DIST\_D_t$	$DIST\_E_t$	$ASSETS_t$	DIV_t	ROA_t	LEV_t	MB_t	$SIZE_t$
$EARNINGS_{t+1}$		0.676	0.038	0.346	0.182	0.274	0.147	0.250	0.145	0.525	0.672	−0.314	0.205	−0.225
$EARNINGS_t$	0.716		0.206	0.597	0.152	0.287	0.073	0.359	0.265	0.624	0.996	−0.384	0.224	−0.211
$ACCRUALS_t$	0.054	0.206		−0.811	−0.002	−0.614	−0.525	−0.359	0.585	−0.027	0.217	0.105	0.097	−0.070
FCF_t	0.329	0.597	−0.811		0.109	0.764	0.547	0.543	−0.413	0.378	0.353	−0.318	0.033	−0.052
$\Delta CASH_t$	0.167	0.152	−0.002	0.109		−0.342	−0.200	−0.265	0.408	0.071	0.177	−0.102	0.087	−0.034
$DIST_t$	0.256	0.287	−0.614	0.764	−0.342		0.668	0.702	−0.688	0.374	0.288	−0.293	−0.021	−0.007
$DIST\_D_t$	0.151	0.073	−0.525	0.547	−0.200	0.668		0.124	−0.528	0.126	0.185	−0.282	−0.098	−0.031
$DIST\_E_t$	0.248	0.359	−0.359	0.543	−0.265	0.702	0.124		−0.444	0.445	0.259	−0.158	0.060	−0.004
$ASSETS_t$	0.151	0.249	0.572	−0.367	0.367	−0.654	−0.496	−0.407		−0.014	0.264	−0.002	0.214	−0.100
DIV_t	0.499	0.582	−0.025	0.353	0.040	0.406	0.120	0.496	−0.065		0.618	−0.395	0.234	−0.288
ROA_t	0.715	0.998	0.192	0.328	0.166	0.261	0.147	0.279	0.249	0.582		−0.386	0.218	−0.212
LEV_t	−0.331	−0.398	0.100	−0.321	−0.128	−0.267	−0.204	−0.213	0.002	−0.400	−0.398		0.117	0.349
MB_t	0.239	0.273	0.070	0.095	0.092	0.022	−0.047	0.074	0.186	0.103	0.273	0.023		−0.100
$SIZE_t$	−0.259	−0.258	−0.067	−0.047	−0.054	−0.015	−0.025	−0.068	−0.105	−0.225	−0.261	0.343	−0.067	

The part above the diagonal represent the Pearson Correlation while the numbers under the diagonal represent the Spearman correlations.

on the balance sheet, while the gains from equity financing are more likely to transferred directly in cash or used to fund operating expenditures which are promptly charged to net income instead of being capitalized on the balance sheet.

Next, we will examine the correlations of FCF_t. When we look at the components of FCF_t, we find high correlations between FCF_t and the $DIST\_D_t$ and $DIST\_E_t$ components of 0.619 and 0.698 respectively for the total sample. Notably, the correlations of the CL firms are much higher (0.701 and 0.770) than the NCL firms (0.547 and 0.543). These high values show that these categories represent important sources of the variation in FCF_t.

The correlation between $\Delta CASH_t$ and $DIST_t$ is -0.465 for the total sample where $DIST\_D_t$ and $DIST\_E_t$ both contribute to this relation with correlation values of -0.319 and -0.435 respectively. The high negative correlation between $\Delta CASH_t$ and $DIST\_E_t$ indicates that gains of equity issuances appears to be more likely kept as cash. However, (Dechow et al., 2008) finds a low correlation between $\Delta CASH_t$ and $DIST\_D_t$ which is close to zero and insignificant. They state that debt issuances are more likely to be directly invested in operating assets. We however find that debt issuances are more likely to be retained as cash due to a high negative correlation between $\Delta CASH_t$ and $DIST\_D_t$.

Additionally, we analyze the firm characteristics between CL and NCL firms. The correlations between $EARNINGS_t$ and the firm characteristics such as MB_t (0.462 for CL firms; 0.224 for NCL firms) and $SIZE_t$ (-0.090 for CL firms; -0.211 for NCL firms) are much higher (or less negative) for CL firms.

4.3 Regression Results

4.3.1 Persistence Results, no decomposition of earnings

Table 4 presents the regression results of the model where we regress earnings on lagged earnings. The table also presents the results of equation (6) which includes a dummy variable to incorporate the cross-listing effect. The dummy variable *CL* takes on the value of one if the respective firm is cross-listed and takes on the value of zero if the firm is non-cross-listed. As mentioned in section 3.4, Ndubizu and Sallehu (2017) describes two calculation

methods to construct the variables. The regression results using variables constructed with balance sheet data are displayed in the left section, while the regression results using variables constructed with the statements of cash flows are displayed on the right section. The T-statistic is displayed in parenthesis directly under the coefficient of the respective variable. $EARNINGS_t$ is scaled by total average assets.

Table 4: Regression Results Without Earnings Decomposition

$EARNINGS_{t+1} = \beta_0 + \beta_1\ EARNINGS_t + \varepsilon_{t+1}$ *(a)*

$EARNINGS_{t+1} = \beta_0 + \beta_1\ EARNINGS_t + \beta_2\ CL + \beta_3\ CL \times EARNINGS_t + \varepsilon_{t+1}$ *(b)*

		Balance Sheet Method		Cash Flow Statement Method	
	Pred. sign	*(a)*	*(b)*	*(a)*	*(b)*
Intercept		0.013***	0.010***	0.014***	0.011***
		(10.80)	(6.59)	(11.20)	(6.39)
$EARNINGS_t$	+	0.667***	0.623***	0.648***	0.647***
		(43.65)	(31.36)	(40.92)	(31.58)
CL			0.009***		0.008***
			(3.70)		(3.03)
$CL \times EARNINGS_t$	+		0.134***		0.102**
			(4.25)		(3.61)
Adjusted R^2		0.43	0.42	0.42	0.41

*,** and *** denote significance levels at 0.05, 0.01 and 0.001 respectively. T-statistics are presented in parenthesis.

We first discuss the results of the regression where we construct the variables with balance sheet data in the left section. In the model which includes the cross-listing cross-term, we find that the coefficient of β_1 ($EARNINGS_t$) is equal to 0.623 and is significant. This is similar to the results of Dechow et al. (2008) who finds 0.679. Furthermore, we find that β_3 ($CL \times EARNINGS_t$) is equal to 0.134 which is positive and also significant. As this parameter measures the additional earnings persistence of CL firms, we therefore find evidence in favor of Hypothesis **H1** that the earnings of CL firms is more persistent than NCL firms. The adjusted R^2 is 0.42 which is higher than the study of Ndubizu and Sallehu (2017) who has a value of 0.32. However, our adjusted R^2 is lower than Dechow et al. (2008) who reports a value of 0.55.

When we look at the results based on the cash flow statement method we find similar

results. β_1 ($EARNINGS_t$) is equal to 0.647 and is positive and significant. More importantly, β_3 ($CL \times EARNINGS_t$) is equal to 0.102 and is positive and significant. As a result, we again find evidence in favor of hypothesis **H1** that the earnings of CL firms are more persistent than NCL firms. The reported adjusted R^2 is almost similar with 0.41.

4.3.2 Persistence Results, with decomposition of earnings (Sloan 1996)

Sloan (1996) finds that the accrual component is more persistent than the cash flow component as it is likely that the accrual component is more affected to distortion or diminishing returns to investments. In order to get more insight into this phenomenon, we also perform the analysis when we decompose earnings into accrual and cash components and evaluate the results in a cross-listed setting. Table 5 shows the regressions results of two models: the first model is the original model of Sloan (1996) which decomposes $EARNINGS_t$ into $ACCRUALS_t$ and FCF_t. The second model is the model from equation (7) which includes an interaction dummy term for cross-listed firms. The dummy variable CL takes a value of one for cross-listed firms and zero for non-cross-listed firms. T-statistics are presented in parenthesis. In addition, joint Wald F-tests are presented at the bottom section of the table which test the respective hypothesis in the first column. All variables are scaled by total average assets.

First, we look at the regression results where we calculated the variables with the balance sheet method. We test hypothesis **H2a** that the cash component of earnings is more persistent than the accrual component of earnings. In the model without the interaction terms, we find that β_1 ($ACCRUALS_t$) is 0.612 which is positive and significant. β_2 (FCF_t) is 0.685 which is also positive and significant. Our results therefore show that $FCF_t > ACCRUALS_t$ which is in correspondence with Sloan (1996) as we also measure that the cash component is more persistent than the accrual component. The bottom section of the table presents the joint Wald F-test where we test if $\beta_1 = \beta_2$ ($FCF_t = ACCRUALS_t$). The F-value is 25.70 which is significant and therefore we reject the hypothesis that $\beta_1 = \beta_2$ and find evidence in favor of **H2a** that the cash component of earnings is more persistent than the accrual component of earnings.

Table 5: Regression Results With Earnings Decomposition (Sloan 1996)

$$EARNINGS_{t+1} = \beta_0 + \beta_1 ACCRUALS_t + \beta_2 FCF_t + \varepsilon_{t+1} \quad (a)$$

$$EARNINGS_{t+1} = \beta_0 + \beta_1 ACCRUALS_t + \beta_2 FCF_t + \beta_3 CL + \beta_4 CL \times ACCRUALS_t + \beta_5 CL \times FCF_t + \varepsilon_{t+1} \quad (b)$$

		Balance Sheet Method		Cash Flow Statement Method	
	Pred. sign	*(a)*	*(b)*	*(a)*	*(b)*
Intercept		0.014***	0.010***	0.014***	0.011***
		(11.78)	(6.69)	(11.15)	(6.39)
$ACCRUALS_t$	+	0.612***	0.584***	0.594***	0.561***
		(35.62)	(28.31)	(33.82)	(25.27)
FCF_t	+	0.685***	0.643***	0.634***	0.609***
		(42.35)	(31.63)	(36.11)	(26.93)
CL			0.009***		0.009***
			(13.76)		(13.29)
$CL \times ACCRUALS_t$	+		0.102***		0.094***
			(13.13)		(12.84)
$CL \times FCF_t$	+		0.156***		0.128***
			(14.84)		(13.48)
Adj. R squared		0.46	0.42	0.44	0.43
F-Test		F-Stat (p-Value)			
$\beta_1 = \beta_2$		25.70***	18.46***	19.84***	17.83***
		(0.000)	(0.000)	(0.000)	(0.000)
$\beta_1 + \beta_4 = \beta_2 + \beta_5$			23.44***		13.53***
			(0.000)		(0.000)
$\beta_4 = \beta_5$			19.54***		12.47***
			(0.000)		(0.000)

*,** and *** denote significance levels at 0.05, 0.01 and 0.001 respectively. T-statistics are presented in parenthesis. The bottom part of the table presents the F-statistics for the Joint Wald F-test which tests the respective hypothesis in the first column.

The parameters of importance to test for hypothesis **H2b** which states that the accrual component of earnings is more persistent than the cash flow component of earnings, when we only consider the additional effect of cross-listing, are β_4 ($CL \times ACCRUALS_t$) and β_5 ($CL \times FCF_t$). These parameters are present in the model which includes the cross-listing interactions term. We find coefficients of 0.102 and 0.156 respectively which are both positive and significant. We note that both coefficients are in favor of hypothesis **H1** that CL firms are more persistent than NCL firms. We find that the effect of cross-listing has a bigger

impact on the persistence of the cash flow component compared to the persistence of the accrual component, which is the opposite what we were expecting. We formally test both coefficients jointly with $\beta_4 = \beta_5$ ($CL \times ACCRUALS_t = CL \times FCF_t$) and find a F-statistic of 19.54 and is significant. Our results are not in favor of hypothesis **H2b** that the accrual component is more persistent than the cash flow component when we consider the additional effect of cross-listing. Additionally, the joint Wald F-test which tests if $\beta_1 + \beta_4 = \beta_2 + \beta_5$ [1] gives us a F-statistic of 23.44 and is significant on a 0.01 level. When we consider all effects jointly, we find evidence that for cross-listed firms the cash component of earnings is more persistent than the accrual component of earnings.

Second, we present the results at the right section of table 5 where we construct the variables using the statement of cash flows as stated in Ndubizu and Sallehu (2017). We test hypothesis **H2a** using the regression model without the cross-listing interaction term. We find that β_1 ($Accruals_t$) is 0.594 and β_2 (FCF_t) is 0.634 and both are significant. The joint Wald F-test for $\beta_1 = \beta_2$ gives us the F-statistic of 19.84 and is significant. We find evidence in favor of hypothesis **H2a** that the cash flow component is more persistent than the accrual component for the whole sample. In the model which includes the cross-listing terms, we find for β_4 ($CL \times ACCRUALS_t$) and β_5 ($CL \times FCF_t$) coefficients of 0.094 and 0.128 respectively. The values are positive and significant and are in favor of hypothesis **H1** as the persistence of the two components for CL firms is higher than NCL firms, but the coefficients are not in favor of hypothesis **H2b** as the cross-listing effect is smaller for the accrual component compared to the cash flow component. The joint test for $\beta_4 = \beta_5$ ($CL \times ACCRUALS_t = CL \times FCF_t$) has a F-statistic of 12.47 and we find evidence in favor of the alternative hypothesis that $\beta_4 < \beta_5$. This is the opposite compared to our expectations of hypothesis **H2b**.

Thus, we find that the cash flow component of earnings is more persistent than the accrual component of earnings for the whole sample. This is in line with our expectations of hypothesis **H2a** and the findings of Sloan (1996). We stated in hypothesis **H2b** that the cross-listing effect would have a bigger impact on the persistence of the accrual component compared to the persistence of the cash flow component. However, the results indicate that the opposite is

[1] $ACCRUALS_t + (CL \times ACCRUALS_t) = FCF_t + (CL \times FCF_t)$

more likely true. We reach the same conclusions when we compute the variables using the cash flow statement method.

4.3.3 Persistence Results, with full decomposition of earnings (Dechow et al. 2008)

Dechow et al. (2008) further decomposes the cash component of earnings into three more components: $\Delta CASH_t$, $DIST\_D_t$ and $DIST\_E_t$. A point of interest is the effect on each individual component on earnings persistence. Table 6 presents the regression results of equation (3) and equation (14) where we further decompose the cash component proposed by Dechow et al. (2008). Again, the table consists of two sections were in each section we compute the variables either by balance sheet data or by statements of cash flows (Ndubizu & Sallehu, 2017). The dummy variable *CL* takes on the value of one if the firm is cross-listed and zero otherwise. All variables are scaled by total average assets.

We first only examine the results from the model without the cross-listing effect and where the variables are calculated using the balance sheet method. For β_1 ($ACCRUALS_t$), β_2 ($\Delta CASH_t$), β_3 ($DIST\_D_t$) and β_4 ($DIST\_E_t$) we find values of 0.362, 0.484, 0.321 and 0.463 which are all positive and significant. We note that the individual components of the cash component each have a higher persistence than $ACCRUALS_t$ as indicated by the higher coefficient values. These values are comparable with the results of Dechow et al. (2008) which report coefficients of similar values. Our adjusted R^2 is 0.33 while Dechow et al. (2008) reports 0.43. Hypothesis **H3a** states that the cash distribution to equity holders is more persistent than the distribution to debt holders. Our results show indeed that $\beta_4 > \beta_3$ ($DIST\_E_t > DIST\_D_t$) with values 0.563 and 0.421, respectively. The joint test for $\beta_3 = \beta_4$ gives a F-statistic of 27.11 which is significant. We find evidence in favor of hypothesis **H3a**.

Next, we add the cross-terms to measure the cross-listing effect. We find for CL firms that β_6 ($CL \times ACCRUALS_t$), β_8 ($CL \times DIST\_D_t$) and β_9 ($CL \times DIST\_E_t$) are positive and significant with coefficients of 0.169, 0.141 and 0.122 respectively. The coefficients are in favor for hypothesis **H1** as the persistence levels for the variables are higher for CL firms compared to NCL firms. β_7 ($CL \times \Delta CASH_t$) is 0.052 is positive but not significant. Apparently, the $DIST\_D_t$ and $DIST\_E_t$ of the cash component contribute more to earnings persistence than

Table 6: Regression Results With Earnings Decomposition (Dechow et al. 2008)

$$EARNINGS_{t+1} = \beta_0 + \beta_1\, ACCRUALS_t + \beta_2\, \Delta CASH_t + \beta_3\, DIST\_D_t + \beta_4\, DIST\_E_t + \varepsilon_{t+1} \quad (a)$$

$$EARNINGS_{t+1} = \beta_0 + \beta_1\, ACCRUALS_1 + \beta_2\, \Delta CASH_t + \beta_3\, DIST\_D_t + \beta_4\, DIST\_E_t + \beta_5\, CL + \beta_6\, CL \times ACCRUALS_t + \beta_7\, CL \times \Delta CASH_t + \beta_8\, CL \times DIST\_D_t + \beta_9\, CL \times DIST\_E_t + \varepsilon_{t+1} \quad (b)$$

		Balance Sheet Method		Cash Flow Statement Method	
	Pred. sign	*(a)*	*(b)*	*(a)*	*(b)*
Intercept		0.020***	0.022***	0.014***	0.009***
		(14.64)	(13.36)	(9.86)	(4.88)
$ACCRUALS_t$	+	0.362***	0.203***	0.423***	0.301***
		(21.74)	(13.09)	(24.07)	(18.17)
$\Delta\, CASH_t$	+	0.484***	0.417***	0.611***	0.634***
		(22.42)	(15.57)	(22.56)	(18.62)
$DIST\_D_t$	+	0.321***	0.257***	0.527***	0.486***
		(15.51)	(10.86)	(22.87)	(17.18)
$DIST\_E_t$	+	0.463***	0.316***	0.677***	0.685***
		(24.92)	(16.30)	(23.22)	(20.22)
CL			0.01*		0.011*
			(4.07)		(3.97)
$CL \times ACCRUALS_t$	+		0.169**		0.109*
			(5.95)		(2.37)
$CL \times \Delta\, CASH_t$	+		0.052		−0.064
			(1.21)		(-1.07)
$CL \times DIST\_D_t$	+		0.141*		0.124*
			(3.46)		(3.03)
$CL \times DIST\_E_t$	+		0.122*		0.113*
			(3.08)		(2.81)
Adj. R squared		0.33	0.36	0.39	0.40
F-Test		F-Stat (p-Value)			
$\beta_3 = \beta_4$		27.44***	23.57***	63.22***	113.22 ***
		(0.000)	(0.000)	(0.000)	(0.000)
$\beta_8 = \beta_9$			0.20		0.26
			(0.66)		(0.954)

*,** and *** denote significance levels at 0.05, 0.01 and 0.001 respectively. t-statistics are presented in parenthesis. The bottom part of the table presents the F-statistics for the Joint Wald F-test which tests the respective hypothesis in the first column.

$\Delta CASH_t$ when we only consider the additional effect of cross-listing. This is in line with the notion of Ndubizu and Sallehu (2017) who finds that changes in the cash component of

earnings does not have the same homogeneous effects on all three individual components. We use the Joint Wald F-test to check if the persistence coefficients of β_7 ($CL \times \Delta CASH_t$), β_8 ($CL \times DIST\_D_t$) and β_9 ($CL \times DIST\_E_t$) are significantly different from each other. The biggest difference we measure is between β_7 ($CL \times \Delta CASH_t$) and β_8 ($CL \times DIST\_D_t$) and the Wald F-test for $\beta_7 = \beta_8$ gives us an F-value of 3.66 (not tabulated), which has a p-value of 0.056 which is not significant on a 0.05 level. We do not find that either $\Delta CASH_t$, $DIST\_D_t$ or $DIST\_E_t$ dominates when we consider the cross-listing effect on earnings persistence. Consequently, we find evidence in support of hypothesis **H3b** that the distribution to equity holders is not more persistent than the distribution to debt holders when we look at the additional effect of cross-listing.

When we consider the results using the variables constructed via the statements of cash flows we find similar results. In the regression without the cross-terms, the coefficient values for β_1 ($ACCRUALS_t$), β_2 ($\Delta CASH_t$), β_3 ($DIST\_D_t$) and β_4 ($DIST\_E_t$) are 0.423, 0.611, 0.527 and 0.677, respectively. The coefficients are all positive and significant, and we observe that $\beta_4 > \beta_3$. The F-statistic of the joint Wald test for $\beta_3 = \beta_4$ is 63.22 and is significant. The results are in favor of hypothesis **H3a** that the distribution to equity holders is more persistent than the distribution to debt holders. Results are the same when the variables are calculated using the statements of cash flows.

For the regression results which includes the cross-listing dummies and where the variables are calculated using the statements of cash flows, we observe that β_6 ($CL \times \Delta CASH_t$), β_8 ($CL \times DIST\_D_t$) and β_9 ($CL \times DIST\_E_t$) have the respective coefficients of 0.109, 0.124 and 0.113 which are positive and significant. We find evidence in favor of hypothesis **H1** that these three variables are more persistent for CL firms compared to NCL firms. We note that β_7 ($CL \times \Delta CASH_t$) has the negative value of -0.064 but is not significant.

We test hypothesis **H3b** by testing that $\beta_8 = \beta_9$ ($CL \times DIST\_D_t = CL \times DIST\_E_t$). The joint Wald test is insignificant (F = 0.26; p = 0.954) and we find evidence in favor of hypothesis **H3b** that the persistent of the distribution to equity holders is not more persistent than the distribution to debt holders when we only consider the additional effect of cross-listing.

To conclude, the results show that each individual cash component of $\Delta CASH_t$, $DIST\_D_t$

and $DIST\_E_t$ has higher earnings persistence than $ACCRUALS_t$. The results are in favor of hypothesis **H3a** as we find evidence that the distribution to equity holders is more persistent than the distribution to debt holders. When we factor in the cross-listing effect, we observe that the persistence of $ACCRUALS_t$, $DIST\_D_t$ and $DIST\_E_t$ increase which is in line with our hypothesis that cross-listed firms have higher earnings persistence (hypothesis **H1**). Results also show that the persistence of either individual component does not dominate the other as we cannot find significant differences between the coefficients. Therefore we do find evidence in favor of hypothesis **H3b**. The results are similar when we compute the variables by either by balance sheet data or via the statements of cash flows.

4.3.4 Persistence Results, decomposing EARNINGS$_{t+1}$

This section provides additional insights how lagged earnings components relates to current earnings components. Until now, the regression results were obtained by regressing the complete total earnings on the lagged earnings components. However, the question remains how lagged earnings components are related to current earnings components. Are individual earnings components only persistent with themselves or are they also persistent with other earnings components? We perform the analysis by applying the model of Dechow et al. (2008) as stated in equation (14) but instead of using $EARNINGS_{t+1}$ as the dependent variable, we use the decomposed earnings components as dependent variables. Table 7 shows the regression results where we regress $ACCRUALS_{t+1}$, $\Delta CASH_{t+1}$, $DIST\_D_{t+1}$ and $DIST\_E_{t+1}$ on the lagged decomposed earnings components. The results in table 7 are obtained using the variables computed via the balance sheet method and contains the cross-term dummies to measure the cross-listing effect.

We observe for β_1 ($ACCRUALS_t$), β_2 ($\Delta CASH_t$), β_3 ($DIST\_D_t$)and β_4 ($DIST\_E_t$) that most coefficients are large in magnitude (either positive or negative) and are significant across all four regressions. Apparently, the persistence of an earnings component is not solely dependent on its own lagged value but other lagged earnings components as well. For example, regressing $DIST\_D_{t+1}$ on the earnings components results that β_3 ($DIST\_D_t$) equals -0.046 and is insignificant. While, β_1 ($ACCRUALS_t$) has the largest (negative) coefficient of -0.164

Table 7: Regression Results with decomposition of EARNINGS$_{t+1}$

$$Y = \beta_0 + \beta_1\, ACCRUALS_t + \beta_2\, \Delta CASH_t + \beta_3\, DIST\_D_t + \beta_4\, DIST\_E_t + \beta_5\, CL + \beta_6\, CL \times ACCRUALS_t + \beta_7\, CL \times \Delta CASH_t + \beta_8\, CL \times DIST\_D_t + \beta_9\, CL \times DIST\_E_t + \varepsilon_{t+1}$$

	Dependent Variable Y			
	$ACCRUALS_{t+1}$	$\Delta CASH_{t+1}$	$DIST\_D_{t+1}$	$DIST\_E_{t+1}$
Intercept	0.012***	0.006***	−0.004*	0.002
	(4.41)	(3.83)	(-2.22)	(1.14)
$ACCRUALS_t$	0.298***	0.069***	−0.164***	0.104***
	(8.78)	(3.40)	(-6.99)	(4.57)
$\Delta CASH_t$	0.451***	−0.010	−0.122***	0.262***
	(8.80)	(-0.33)	(-3.45)	(7.64)
$DIST\_D_t$	0.096*	0.080**	−0.046	0.154***
	(1.93)	(2.70)	(-1.36)	(4.63)
$DIST\_E_t$	0.134***	0.068**	−0.091**	0.333***
	(3.04)	(2.60)	(-2.98)	(11.26)
CL	0.004	−0.002	0.001	0.005
	(0.94)	(-0.64)	(0.29)	(1.69)
$CL \times ACCRUALS_t$	0.097*	0.003	0.024	0.063
	(2.01)	(0.09)	(0.61)	(1.63)
$CL \times \Delta\, CASH_t$	−0.062	−0.031	0.096	0.005
	(-1.45)	(-0.64)	(1.65)	(0.09)
$CL \times DIST\_D_t$	0.077	−0.004	0.051	0.083
	(1.73)	(-0.09)	(0.92)	(1.69)
$CL \times DIST\_E_t$	0.064	−0.006	0.064	0.096*
	(1.69)	(-0.14)	(1.52)	(1.98)
Adj. R squared	0.09	0.01	0.04	0.15

*,** and *** denote significance levels at 0.05, 0.01 and 0.001 respectively. T-statistics are presented in parenthesis. The variables are calculated using the balance sheet method.

which is significant and is therefore more indicative for the persistence of $DIST\_D_t$.

However, when we consider the cross-listing effect by observing variables containing the dummy cross-terms we find different results. We observe that the coefficients are smaller in magnitude and only few values are significant. In the regression where $ACCRUALS_{t+1}$ is regressed on the earnings components, β_6 ($CL \times ACCRUALS_t$) has a value of 0.097 and is

significant. This is in line with the notion that cross-listed firms have higher earnings persistence due to the more stringent requirements of US GAAP. The stringent requirement results that accruals are more indicative of future accruals. Regarding the cash flow components, we only observe in the model where we regress $DIST\_E_{t+1}$ on the earnings components that β_9 ($CL \times DIST\_E_t$) is significant with 0.096.

4.3.5 Persistence Results, Hou et al.(2012)

Table 8 presents the regression results of the Hou et al. (2012) model. We also add the dummy cross-terms where the value equals one if the firm is cross-listed, and zero otherwise. We first look at the regression where the variables are calculated via the balance sheet method. In order to measure the effect of cross-listing on earnings persistence we look at the coefficient value of β_{11} ($CL \times EARNINGS_t$) which is 0.052 and is insignificant. In contrast to the aforementioned results of the previous models, we do not find evidence in favor of hypothesis **H1** that cross-listing has an effect on earnings persistence. The model of Hou et al. (2012) adds other accounting variables such as $ASSETS_t$ and DIV_t which seem to have high predictive value on future earnings with significant coefficients of 0.127 and 0.553, respectively. The fact that the cross-listing effect on earnings persistence dissipates when other variables are introduced, might imply that the previous results were generated by a misspecified models. While we aim to measure the effect of cross-listing, instead we might have measured effects related to other firm characteristics. The same results are found when we use the cash flow statement method to calculate the variables.

4.3.6 Persistence Results, Li & Mohanram (2014)

The model of Li and Mohanram (2014) allows for different persistence levels for negative and positive earnings. The regression results are displayed in table 9.

Using the balance sheet method, results show that β_3 ($CL \times EARNINGS_t$) equals 0.139 that is positive en significant. This is in line with hypothesis **H1** that the cross-listing effect has a positive effect on earnings persistence. We note that β_7 ($NegE_t \times CL \times EARNINGS_t$)

Table 8: Regression Results (Hou et al. 2012)

$$EARNINGS_{t+1} = \beta_0 + \beta_1\, ASSETS_1 + \beta_2\, DIV_t + \beta_3\, DD_t + \beta_4\, EARNINGS_t + \beta_5\, Neg\_E_t + \beta_6\, ACCRUALS_t + \varepsilon_{t+1} \quad (a)$$

$$EARNINGS_{t+1} = \beta_0 + \beta_1\, ASSETS_1 + \beta_2\, DIV_t + \beta_3\, DD_t + \beta_4\, EARNINGS_t + \beta_5\, Neg\_E_t + \beta_6\, ACCRUALS_t + \beta_7\, CL + \beta_8\, CL \times ASSETS_t + \beta_9\, CL \times DIV_t + \beta_{10}\, CL \times DD_t + \beta_{11}\, CL \times EARNINGS_t + \beta_{12}\, CL \times Neg\_E_t + \beta_{13}\, CL \times ACCRUALS_t + \varepsilon_{t+1} \quad (b)$$

		Balance Sheet Method		Cash Flow Statement Method	
	Pred. sign	*(a)*	*(b)*	*(a)*	*(b)*
INTERCEPT		−0.119***	−0.124	−0.061***	−0.06 ***
		(-5.89)	(-4.99)	(-3.18)	(-2.45)
$ASSETS_t$		0.125***	0.127***	0.067***	0.062**
		(6.32)	(5.21)	(3.61)	(2.6)
DIV_t		0.454***	0.553***	0.419***	0.504***
		(4.87)	(3.85)	(4.24)	(3.35)
DD_t		−0.002	−0.002	−0.001	0.001
		(-0.67)	(-0.42)	(-0.18)	(0.34)
$EARNINGS_t$	+	0.662***	0.659***	0.682***	0.685***
		(25.01)	(18.99)	(24.84)	(18.83)
Neg_E_t		0.010**	0.009*	0.012**	0.011*
		(2.34)	(1.8)	(2.6)	(1.95)
$ACCRUALS_t$		−0.128***	−0.144***	−0.120***	−0.128***
		(-8.49)	(-7.72)	(-6.94)	(-5.85)
CL			0.007		−0.004
			(0.16)		(-0.09)
$CL \times ASSETS_t$			0.004		0.015
			(0.09)		(0.4)
$CL \times DIV_t$			−0.138		−0.103
			(-0.72)		(-0.51)
$CL \times DD_t$			−0.004		−0.007
			(-0.68)		(-1.18)
$CL \times EARNINGS_t$	+		0.052		0.033
			(0.78)		(0.55)
$CL \times Neg\_E_t$			0.002		0.004
			(0.20)		(0.43)
$CL \times ACCRUALS_t$			0.040		0.025
			(1.25)		(0.70)
Adj. R squared		0.48	0.48	0.45	0.46

*,** and *** denote significance levels at 0.05, 0.01 and 0.001 respectively. T-statistics are presented in parenthesis.

Table 9: Regression Results (Li & Mohanram 2014)

$$EARNINGS_{t+1} = \beta_0 + \beta_1\, EARNINGS_t + \beta_4\, NegE_t + \beta_5\, NegE_t \times EARNINGS_t + \varepsilon_{t+1} \quad (a)$$

$$EARNINGS_{t+1} = \beta_0 + \beta_1\, EARNINGS_t + \beta_2\, CL + \beta_3\, CL \times EARNINGS_t + \beta_4\, NegE_t + \beta_5\, NegE_t \times EARNINGS_t + \beta_6\, NegE_t \times CL + \beta_7\, NegE_t \times CL \times EARNINGS_t + \varepsilon_{t+1} \quad (b)$$

		Balance Sheet Method		Cash Flow Statement Method	
	Pred. sign	*(a)*	*(b)*	*(a)*	*(b)*
INTERCEPT		0.003 (1.43)	−0.001 (-0.28)	0.004 (2.02)	0.000 (-0.11)
$EARNINGS_t$	+	0.803*** (31.53)	0.713*** (19.93)	0.783*** (30.97)	0.695*** (20.22)
CL			0.007* (1.92)		0.009* (2.19)
$CL \times EARNINGS_t$	+		0.139* (2.17)		0.117** (1.82)
Neg_E_t		−0.001 (-0.29)	−0.002 (-0.32)	−0.003 (-0.52)	−0.001 (-0.18)
$Neg\_E_t \times EARNINGS_t$		−0.382*** (-6.79)	−0.349*** (-4.99)	−0.420*** (-6.81)	−0.384*** (-5.10)
$Neg\_E_t \times CL$			0.001 (0.01)		−0.004 (-0.43)
$Neg\_E_t \times CL \times EARNINGS_t$			−0.019 (-0.62)		−0.033 (0.81)
Adj. R squared		0.46	0.47	0.45	0.45

*,** and *** denote significance levels at 0.05, 0.01 and 0.001 respectively. T-statistics are presented in parenthesis.

equals -0.019 and is insignificant. This implies that the cross-listing effect does not significantly impact earnings persistence in loss situations (with negative earnings). These results are robust when we calculate the variables using the statements of cash flows.

4.4 Robustness Tests

It is imperative that further testing should be done in order to examine if the models are misspecified. Therefore, we perform the same analysis except we add other control variables in order to test if our models are robust. The control variables are related to firm characteristics and they are the following variables: Return on Assets (ROA_t), Market-to-book ratio (MB_t), firm size ($SIZE_t$) and leverage LEV_t. Table 1 displays how the control variables are constructed. In the following section we will discuss the results of the AR(1) model, the model

of Sloan (1996) and the model of Li and Mohanram (2014).

Table 10 presents the results of the simple AR(1) model which includes the firm control variables. We observe that the cross-listing effect on earnings persistence dissipates as β_3

Table 10: Regression Results without earnings decomposition, with control variables

$$EARNINGS_{t+1} = \beta_0 + \beta_1\, EARNINGS_t + \beta_2\, ROA_t + \beta_3\, MB_t + \beta_4\, SIZE_t + \beta_5\, LEV_t + \varepsilon_{t+1} \quad (a)$$

$$EARNINGS_{t+1} = \beta_0 + \beta_1\, EARNINGS_t + \beta_2\, CL + \beta_3\, CL \times EARNINGS_t + \beta_4\, ROA_t + \beta_5\, MB_t + \beta_6\, SIZE_t + \beta_7\, LEV_t + \varepsilon_{t+1} \quad (b)$$

		Balance Sheet Method		Cash Flow Statement Method	
	Pred. sign	*(a)*	*(b)*	*(a)*	*(b)*
Intercept		0.000 (-0.01)	0.000 (-0.02)	0.002 (0.34)	0.001 (0.29)
$EARNINGS_t$	+	0.611*** (6.13)	0.736*** (6.29)	0.577*** (7.40	0.635*** (7.88)
CL			0.009** (3.91)		0.010*** (3.66)
$CL \times EARNINGS_t$	+		0.033 (0.87)		0.013 (0.76)
ROA_t		−0.007 (-0.69)	−0.011 (-0.93)	−0.025 (0.32)	−0.026 (-0.32)
MB_t		0.041*** (5.73)	0.036*** (5.68)	0.039*** (6.24)	0.040*** (6.50)
$SIZE_t$		0.052** (2.81)	0.047* (2.49)	0.034* (2.41)	0.031* (1.97)
LEV_t		−0.020** (-2.88)	−0.021* (-2.99)	−0.019* (-2.45)	−0.019* (-2.52)
Adj. R squared		0.46	0.47	0.45	0.45

*,** and *** denote significance levels at 0.05, 0.01 and 0.001 respectively. T-statistics are presented in parenthesis.

($CL \times EARNINGS_t$) is not significant for both variable calculation methods (0.033 for balance sheet method; 0.013 for cash flow statement method). Therefore, there is no evidence in favor of hypothesis **H1** that cross-listing has a positive effect on earnings persistence. MB_t, $SIZE_t$ and LEV_t are significant and seemingly have great influence on earnings persistence. In section 4.1 we observed that the cross-listed firms have different firm characteristics compared to non-cross-listed firms. It seems that the initial model without the control variables

was misspecified in the sense that the cross-listing dummy did not measure the cross-listing effect but was more indicative of the firm's size and market value. Results imply that bigger firms and firms with higher market-to-book ratios have higher earnings persistence.

Table 11 displays the regression results where we decompose $EARNINGS_t$ into $ACCRUALS_t$ and FCF_t with the added control variables. Results show again that the cross-listing effect has no significant effect on earnings persistence based on both calculation methods. β_4 ($CL \times ACCRUALS_t$) shows coefficients of -0.001 and 0.005 for the balance sheet method and cash flow method respectively. And β_5 ($CL \times FCF_t$) shows values of 0.027 and 0.018, respectively. All values are insignificant. This is to be expected as the as the previous regression already showed low persistence coefficents for $CL \times EARNINGS_t$.

The last regression we will discuss is the results from the model of Li and Mohanram (2014) where we also add the control variables. The results are displayed in table 12. We observe that the cross-listing interaction effect dissipates as β_3 ($CL \times EARNINGS_t$; coefficient = 0.028) and β_7 ($Neg\_E_t \times CL \times EARNINGS_t$; coefficient = -0.142) are both not significant when the variables are calculated via the balance sheet method. This implies that in both profit and loss situations, we do not find that the cross-listing has an effect on earnings persistence. The results are robust if we calculate the variables using the statements of cash flows.

Table 11: Regression Results with earnings decomposition (Sloan 1996), with control variables

$$EARNINGS_{t+1} = \beta_0 + \beta_1 ACCRUALS_t + \beta_2 FCF_t + \beta_3 ROA_t + \beta_4 MB_t + \beta_5 SIZE_t + \beta_6 LEV_t + \varepsilon_{t+1} \quad (a)$$

$$EARNINGS_{t+1} = \beta_0 + \beta_1 ACCRUALS_t + \beta_2 FCF_t + \beta_3 CL + \beta_4 CL \times ACCRUALS_t + \beta_5 CL \times FCF_t + \beta_6 ROA_t + \beta_7 MB_t + \beta_8 SIZE_t + \beta_9 LEV_t + \varepsilon_{t+1} \quad (b)$$

		Balance Sheet Method		Cash Flow Statement Method	
	Pred. sign	*(a)*	*(b)*	*(a)*	*(b)*
Intercept		0.002 (0.49)	0.003 (0.61)	0.000 (0.)	0 (-0.09)
$ACCRUALS_t$	+	0.613*** (25.47)	0.574*** (24.36)	0.529*** (16.81)	0.506*** (17.31)
FCF_t	+	0.637*** (26.18)	0.618*** (26.23)	0.601*** (18.12)	0.596*** (18.73)
CL			0.009 (3.19)		0.011 (3.77)
$CL \times ACCRUALS_t$	+		−0.001 (-0.04)		0.005 (0.34)
$CL \times FCF_t$	+		0.027 (1.01)		0.018 (0.72)
ROA_t		−0.048 (-0.43)	−0.061 (-0.54)	0.021 (0.26)	−0.037 (-0.47)
MB_t		0.043*** (5.39)	0.049*** (5.66)	0.038*** (6.38)	0.037*** (6.74)
$SIZE_t$		0.049* (2.19)	0.055* (1.96)	0.040* (2.12)	0.038* (1.24)
LEV_t		−0.012 (-1.64)	−0.013 (-1.78)	−0.015* (-1.91)	−0.016* (-2.06)
Adj. R^2		0.46	0.47	0.45	0.46

*,** and *** denote significance levels at 0.05, 0.01 and 0.001 respectively. T-statistics are presented in parenthesis.

Table 12: Regression Results (Li & Mohanram 2014), with control variables

$$EARNINGS_{t+1} = \beta_0 + \beta_1\, EARNINGS_t + \beta_4\, NegE_t + \beta_5\, NegE_t \times EARNINGS_t + \beta_6\, ROA_t + \beta_7\, MB_t + \beta_8\, SIZE_t + \beta_9\, LEV_t + \varepsilon_{t+1} \quad (a)$$

$$EARNINGS_{t+1} = \beta_0 + \beta_1\, EARNINGS_t + \beta_2\, CL + \beta_3\, CL \times EARNINGS_t + \beta_4\, NegE_t + \beta_5\, NegE_t \times EARNINGS_t + \beta_6\, NegE_t \times CL + \beta_7\, NegE_t \times CL \times EARNINGS_t + \beta_8\, ROA_t + \beta_9\, MB_t + \beta_{10}\, SIZE_t + \beta_{11}\, LEV_t + \varepsilon_{t+1} \quad (b)$$

		Balance Sheet Method		Cash Flow Statement Method	
	Pred. sign	*(a)*	*(b)*	*(a)*	*(b)*
INTERCEPT		−0.011 (-2.3)	−0.01 (-2.03)	−0.011 (-2.19)	−0.01 (-1.95)
$EARNINGS_t$		0.806*** (6.97)	0.861*** (7.19)	0.604*** (7.78)	0.673*** (8.20)
CL			0.008* (2.02)		0.008* (1.93)
$CL \times EARNINGS_t$			0.028 (0.41)		0.013 (0.81)
Neg_E_t		−0.002 (-0.32)	−0.003 (-0.44)	−0.004 (-0.77)	−0.004 (-0.68)
$Neg\_E_t \times EARNINGS_t$		−0.347*** (-5.56)	−0.326*** (-4.25)	−0.429*** (-6.31)	−0.395*** (-4.80)
$Neg\_E_t \times CL$			0.001 (0.12)		0 (0.01)
$Neg\_E_t \times CL \times EARNINGS_t$			−0.142 (-1.11)		−0.182 (-1.29)
ROA_t		−0.041 (-0.37)	−0.088 (-0.78)	0.153 (1.89)	0.094 (1.14)
MB_t		0.045*** (3.36)	0.049*** (3.79)	0.033** (3.83)	0.030** (3.41)
$SIZE_t$		0.041** (3.59)	0.038* (2.30)	0.034* (2.35)	0.036* (2.42)
LEV_t		−0.014* (-1.95)	−0.015* (-2.05)	−0.012 (-1.52)	−0.012 (-1.54)
Adj. R^2		0.47	0.48	0.46	0.47

*,** and *** denote significance levels at 0.05, 0.01 and 0.001 respectively. T-statistics are presented in parenthesis.

4.5 Summary

Using the AR(1) model, the model of Sloan (1996), the model of Dechow et al. (2008) and Li and Mohanram (2014), we manage to find evidence in favor of hypothesis **H1** which states that cross-listing has a positive effect on earnings persistence. We also observe that the persistence of the cash flow component of earnings is higher than the accrual component for the whole sample, which is in line with hypothesis **H2a** and the finding of Sloan (1996). We also expect that cross-listing has a bigger impact on the accrual component of earnings as this component is more susceptible to subjectivity compared to the cash flow component (hypothesis **H2b**). However, results do not support this hypothesis as we do not find evidence that the interaction effect between cross-listing and the accrual component is higher than the interaction between cross-listing and the cash flow component. Further decomposing the cash flow component into three subcomponents, we expect that the distribution to equity holders is more persistent compared to the distribution to debt holders (hypothesis **H3a**). We find evidence in favor of this hypothesis which is in line with the notion of Dechow et al. (2008). Finally, we test hypothesis **H3b** that the interaction between cross-listing and distribution to equity holders does not dominate the interaction between cross-listing and distribution to debt holders. Our results are in favor of this hypothesis. These findings are robust when we calculate the variables using the balance sheet data and the statements of cash flows.

While we found positive and significant coefficients regarding the interaction effect between cross-listing and earnings persistence, results change significantly when we add control variables. By applying the control variables to all the models, we observe that the cross-listing effect dissipates. The variables related to firm size and the firm's market-to-book ratio have explanatory power on the future value of earnings implying that bigger firms and firms with growth opportunities have higher earning persistence. It seems that the cross-listing interactions in our model did not measure the actual cross-listing effect, but it was more indicative of the type of firms which are larger in size and have high growth opportunities. We reach to this conclusion as we have established earlier that cross-listed firms are larger in size and have much larger earnings numbers. As a result, we do not find evidence that cross-listing

has a positive effect on earnings persistence (hypothesis **H1**) and no inference can be drawn regarding hypothesis **H2b** and hypothesis **H3b**.

5 Conclusion

This thesis aims to give an answer to the question "Is the earnings quality of reported disclosures higher for cross-listed firms compared to non-cross-listed firms?". We define earnings quality as earnings persistence. We analyze how previous studies have measured earnings persistence. Sloan (1996) decomposes earnings into a cash flow component and an accrual component. Dechow et al. (2008) further decomposes the cash flow components into smaller subcomponents. We use the same models in order to gain insight how each component interacts with the cross-listing effect. Additionally, we use two models from a different aspect of accounting literature. The models of Hou et al. (2012) and Li and Mohanram (2014) are earnings forecast models which seem to have superior performance in comparison with external analysts' forecasts.

Firms choose to cross-list in order to either (a) raise capital and liquidity, (b) reduce the stake held by existing stakeholders and (c) increase investor protection by having higher disclosure quality. Firms willingly cross-list to financial markets with more stringent disclosure requirements to signal their quality to foreign investors. This is called the bonding hypothesis (Coffee, 1998). Additional accounting literature finds positive relations between earnings persistence and cross-listing.

We expect that US cross-listed firms, which have to adhere to the more stringent requirements of US GAAP, have higher earnings persistence compared to non-cross-listed firms. We test two additional hypothesis. Following Sloan (1996), we test if the cash flow component is more persistent than the accrual component. We also test if the distribution to equity holders is more persistent than the distribution to debt holders.

Our sample data consists of 242 firms from 2001 to 2016 for a total of 3872 firm-year observations. Half of these firms are cross-listed and the other half are non-cross-listed. The sample is selected in pairs, where a US cross-listed firm is paired with a comparable non-cross-listed firm based on country, industry and size. We use two methods to calculate the variables to check if results are robust. We use the balance sheet method which is used by previous studies. And we use the cash flow statement method as described by Ndubizu and

Sallehu (2017).

Initially, we find evidence that support our hypothesis that cross-listing has a positive effect on earnings persistence. We expected that cross-listing would have a larger positive effect on the accrual component of earnings compared to the cash component, as accruals are more susceptible to a greater degree of subjectivity and that the higher accounting standards of US GAAP would mitigate the inaccuracies stated in the accruals. However, we do not find evidence to support this and find that the opposite is more likely true.

We also test if cross-listing has an effect on the persistence of the distribution to equity holders and debt holders. The expectation was that the cross-listing effect has a dampening effect on the persistence of the distribution to equity holders, as share holders are satisfied with a lower level of dividend payouts in exchange for higher investor protection. Additionally, the higher minority investor protection due to cross-listing leads to less private benefits being consumed by controlling shareholders. Results are in favor of this hypothesis.

Unfortunately, results severely change when we add control variables which are related to firm characteristics. The cross-listing effect becomes insignificant when the variables related to size, market-to-book ratio, leverage and ROA are introduced to the models. It seems that firm size and the firm's market-to-book ratio are important determinants for earnings persistence. Apparently, the cross-listing interaction terms in the models are more indicative of the firm's size and the firms growth opportunities than the actual cross-listing effect.

6 Limitations and suggestions for further research

We have a few final remarks and recommendations regarding future research on the topic of cross-listing. First, this study only discusses the cross-listing effect to US stock exchanges and does not take into account the cross-listing effect to other countries. Cross-listings occur to other countries, even to the countries where weak shareholder protection is the norm. A suggestion for further research is why these firms decide to cross-list in those countries. Second, the sample data of this study contains firms which are either already cross-listed or not cross-listed. It might be of interest to investigate firms in a pre/post-cross-listing period to *directly* measure the effect of cross-listing on accounting quality. Third, we have only focused on the earnings persistence property of earnings. Cross-listing can have impacts on other properties of earnings as well. Finally, firms have the opportunity to cross-delist from foreign stock exchanges. It is of interest what the implications are of cross-delistings on accounting quality and to identify why firms choose to cross-delist.

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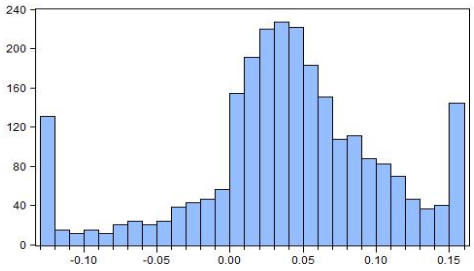
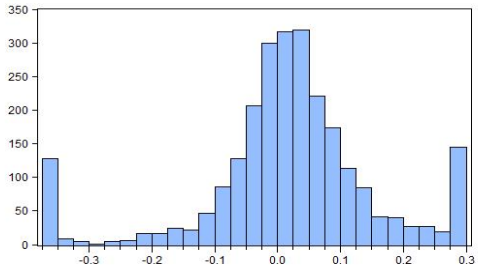
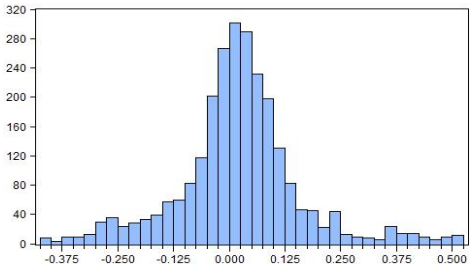
A Histograms



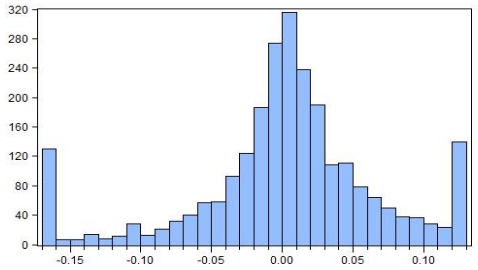
(a) EARNINGS



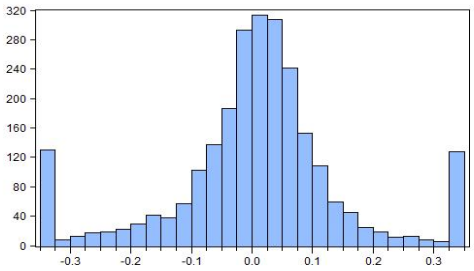
(b) ACCRUALS



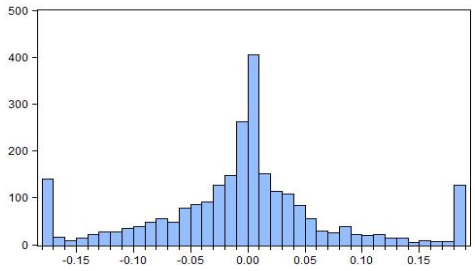
(c) FCF



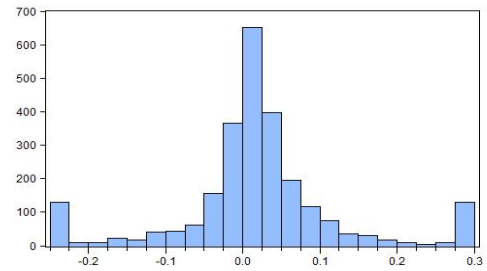
(d) Δ CASH



(e) DIST



(f) DIST_D



(g) DIST_E

B Descriptive Statistics (Cash Flow Statement Method)

Table 13: Descriptive Statistics

Panel A: All Firms (n = 242)									
Variables	Minimum	Maximum	Mean	Std. Dev	Q1	median	Q3	Skewness	Kurtosis
$Earnings_t$	−0.123	0.167	0.045	0.067	0.013	0.045	0.083	−0.489	3.494
$Accruals_t$	−0.144	0.191	0.020	0.079	−0.027	0.015	0.061	0.179	3.033
FCF_t	−0.314	0.311	0.024	0.080	−0.016	0.026	0.067	−0.190	4.693
$\Delta CASH_t$	−0.086	0.109	0.007	0.045	−0.016	0.005	0.028	0.206	3.284
$DIST_t$	−0.169	0.150	0.016	0.074	−0.017	0.021	0.057	−0.589	3.524
$DIST\_D_t$	−0.129	0.128	0.004	0.060	−0.023	0.004	0.037	−0.177	3.214
$DIST\_E_t$	−0.068	0.078	0.015	0.030	0.003	0.012	0.028	−0.410	4.562
Panel B: Only Cross-listed Firms (n = 121)									
Variables	Minimum	Maximum	Mean	Std. Dev	Q1	median	Q3	Skewness	Kurtosis
$Earnings_t$	−0.123	0.167	0.056	0.059	0.025	0.053	0.088	−0.430	4.005
$Accruals_t$	−0.144	0.191	0.023	0.068	−0.018	0.019	0.057	0.203	3.491
FCF_t	−0.289	0.311	0.033	0.070	−0.007	0.031	0.070	0.057	4.660
$\Delta CASH_t$	−0.086	0.109	0.007	0.040	−0.013	0.005	0.023	0.242	3.706
$DIST_t$	−0.169	0.150	0.024	0.066	−0.006	0.024	0.061	−0.527	3.983
$DIST\_D_t$	−0.129	0.128	0.007	0.056	−0.019	0.005	0.037	−0.103	3.465
$DIST\_E_t$	−0.068	0.078	0.019	0.027	0.004	0.015	0.033	−0.326	5.082
Panel C: Only Non-cross-listed Firms (n = 121)									
Variables	Minimum	Maximum	Mean	Std. Dev	Q1	median	Q3	Skewness	Kurtosis
$Earnings_t$	−0.123	0.167	0.033	0.073	0.001	0.035	0.073	−0.370	2.996
$Accruals_t$	−0.144	0.191	0.018	0.089	−0.036	0.010	0.066	0.200	2.617
FCF_t	−0.314	0.311	0.016	0.089	−0.029	0.021	0.061	−0.194	4.299
$\Delta CASH_t$	−0.086	0.109	0.008	0.050	−0.019	0.006	0.032	0.164	2.889
$DIST_t$	−0.169	0.150	0.008	0.081	−0.032	0.017	0.053	−0.522	3.035
$DIST\_D_t$	−0.129	0.128	0.001	0.064	−0.028	0.003	0.036	−0.193	2.949
$DIST\_E_t$	−0.068	0.078	0.010	0.033	0.002	0.007	0.024	−0.344	4.088

The variables are computed using the statements of cash flows as proposed by Ndubizu and Sallehu (2017). All variables are scaled by average total assets and are winsorized at the 5th and 95 percent levels.

C Correlation Matrix (Cash flow Statement Method)

Table 14: Correlation Matrix

Panel A: All Firms (n = 242)	$Earnings_{t+1}$	$Earnings_t$	$Accruals_t$	FCF_t	$\Delta CASH_t$	$DIST_t$	$DIST\_D_t$	$DIST\_E_t$	$ASSETS_t$	DIV_t	ROA_t	LEV_t	MB_t	$SIZE_t$
$EARNINGS_{t+1}$		0.703	0.126	0.409	0.175	0.325	0.223	0.371	0.152	0.517	0.684	−0.247	0.368	−0.132
$EARNINGS_t$	0.734		0.334	0.435	0.162	0.372	0.247	0.419	0.272	0.644	0.995	−0.311	0.353	−0.103
$ACCRUALS_t$	0.159	0.319		−0.703	−0.265	−0.504	−0.510	−0.082	0.667	−0.027	0.231	0.083	0.053	−0.020
FCF_t	0.388	0.406	−0.659		0.375	0.763	0.674	0.395	−0.470	0.412	0.377	−0.265	0.162	−0.043
$\Delta CASH_t$	0.158	0.130	−0.255	0.378		−0.218	−0.162	−0.090	0.398	0.056	0.168	−0.065	0.079	−0.027
$DIST_t$	0.358	0.399	−0.457	0.770	−0.160		0.854	0.488	−0.701	0.403	0.305	−0.255	0.120	−0.005
$DIST\_D_t$	0.224	0.237	−0.489	0.661	−0.146	0.851		0.063	−0.561	0.068	0.097	−0.281	−0.076	−0.010
$DIST\_E_t$	0.394	0.462	0.002	0.368	−0.026	0.451	0.064		−0.418	0.510	0.338	−0.099	0.243	−0.021
$ASSETS_t$	0.173	0.267	0.645	−0.407	0.374	−0.651	−0.528	−0.376		0.004	0.277	0.009	0.160	−0.070
DIV_t	0.529	0.654	−0.003	0.394	0.033	0.425	0.094	0.529	−0.013		0.637	−0.278	0.374	−0.198
ROA_t	0.719	0.994	0.213	0.358	0.150	0.299	0.094	0.349	0.271	0.650		−0.314	0.350	−0.103
LEV_t	−0.238	−0.307	0.083	−0.268	−0.087	−0.235	−0.228	−0.142	−0.003	−0.302	−0.310		0.040	0.129
MB_t	0.356	0.386	0.073	0.162	0.075	0.123	−0.049	0.212	0.163	0.277	0.385	−0.023		−0.200
$SIZE_t$	−0.119	−0.127	−0.009	−0.059	−0.029	−0.040	−0.018	−0.056	−0.049	−0.176	−0.128	0.132	−0.159	
Panel B: Only Cross-listed Firms (n = 121)	$Earnings_{t+1}$	$Earnings_t$	$Accruals_t$	FCF_t	$\Delta CASH_t$	$DIST_t$	$DIST\_D_t$	$DIST\_E_t$	$ASSETS_t$	DIV_t	ROA_t	LEV_t	MB_t	$SIZE_t$
$EARNINGS_{t+1}$		0.725	0.136	0.441	0.173	0.353	0.255	0.377	0.183	0.530	0.724	−0.206	0.470	−0.159
$EARNINGS_t$	0.757		0.325	0.481	0.162	0.409	0.282	0.435	0.296	0.646	0.994	−0.246	0.462	−0.102
$ACCRUALS_t$	0.168	0.322		−0.672	−0.219	−0.517	−0.503	−0.097	0.755	−0.031	0.245	0.061	0.013	0.029
FCF_t	0.421	0.446	−0.624		0.329	0.800	0.686	0.431	−0.528	0.433	0.389	−0.211	0.276	−0.092
$\Delta CASH_t$	0.169	0.138	−0.228	0.353		−0.227	−0.123	−0.143	0.385	0.055	0.172	−0.029	0.071	0.002
$DIST_t$	0.391	0.438	−0.466	0.805	−0.148		0.817	0.531	−0.717	0.411	0.303	−0.215	0.245	−0.080
$DIST\_D_t$	0.255	0.275	−0.476	0.674	−0.103	0.842		0.057	−0.597	0.014	0.013	−0.280	−0.056	−0.005
$DIST\_E_t$	0.429	0.511	−0.016	0.414	−0.041	0.485	0.088		−0.398	0.535	0.375	−0.045	0.385	−0.135
$ASSETS_t$	0.218	0.294	0.716	−0.446	0.384	−0.647	−0.560	−0.352		0.032	0.305	0.018	0.111	−0.017
DIV_t	0.567	0.676	−0.003	0.420	0.039	0.429	0.067	0.534	0.034		0.639	−0.180	0.489	−0.260
ROA_t	0.755	0.991	0.223	0.379	0.148	0.322	0.054	0.377	0.300	0.671		−0.249	0.462	−0.097
LEV_t	−0.207	−0.239	0.068	−0.223	−0.047	−0.212	−0.252	−0.079	−0.012	−0.197	−0.244		−0.027	−0.086
MB_t	0.448	0.496	0.078	0.213	0.058	0.208	−0.052	0.330	0.142	0.429	0.495	−0.066		−0.319
$SIZE_t$	−0.141	−0.117	0.041	−0.119	0.022	−0.137	−0.025	−0.146	0.030	−0.273	−0.112	−0.072	−0.266	
Panel C: Only Non-cross-listed Firms (n = 121)	$Earnings_{t+1}$	$Earnings_t$	$Accruals_t$	FCF_t	$\Delta CASH_t$	$DIST_t$	$DIST\_D_t$	$DIST\_E_t$	$ASSETS_t$	DIV_t	ROA_t	LEV_t	MB_t	$SIZE_t$
$EARNINGS_{t+1}$		0.675	0.125	0.367	0.188	0.283	0.177	0.353	0.129	0.492	0.636	−0.283	0.258	−0.175
$EARNINGS_t$	0.700		0.354	0.377	0.173	0.320	0.196	0.390	0.265	0.624	0.996	−0.384	0.224	−0.211
$ACCRUALS_t$	0.151	0.320		−0.733	−0.309	−0.493	−0.517	−0.061	0.585	−0.027	0.217	0.105	0.097	−0.070
FCF_t	0.345	0.352	−0.703		0.432	0.721	0.654	0.344	−0.413	0.378	0.353	−0.318	0.033	−0.052
$\Delta CASH_t$	0.163	0.137	−0.287	0.418		−0.202	−0.191	−0.028	0.408	0.071	0.177	−0.102	0.087	−0.034
$DIST_t$	0.313	0.342	−0.451	0.730	−0.162		0.887	0.430	−0.688	0.374	0.288	−0.293	−0.021	−0.007
$DIST\_D_t$	0.178	0.182	−0.506	0.644	−0.185	0.864		0.048	−0.528	0.126	0.185	−0.282	−0.098	−0.031
$DIST\_E_t$	0.336	0.389	0.027	0.297	−0.001	0.393	0.020		−0.444	0.445	0.259	−0.158	0.060	−0.004
$ASSETS_t$	0.129	0.249	0.572	−0.367	0.367	−0.654	−0.496	−0.407		−0.014	0.264	−0.002	0.214	−0.100
DIV_t	0.461	0.582	−0.025	0.353	0.040	0.406	0.120	0.496	−0.065		0.618	−0.395	0.234	−0.288
ROA_t	0.674	0.998	0.192	0.328	0.166	0.261	0.147	0.279	0.249	0.582		−0.386	0.218	−0.212
LEV_t	−0.277	−0.398	0.100	−0.321	−0.128	−0.267	−0.204	−0.213	0.002	−0.400	−0.398		0.117	0.349
MB_t	0.258	0.273	0.070	0.095	0.092	0.022	−0.047	0.074	0.186	0.103	0.273	0.023		−0.100
$SIZE_t$	−0.170	−0.258	−0.067	−0.047	−0.054	−0.015	−0.025	−0.068	−0.105	−0.225	−0.261	0.343	−0.067	

This table presents the correlation matrix where the variables $EARNINGS_{t+1}$, $EARNINGS_t$, $ACCRUALS_t$, FCF_t, $\Delta CASH_t$, $DIST_t$, $DIST\_D_t$ and $DIST\_E_t$ are calculated using the statements of cash flows as mentioned in Ndubizu and Sallehu (2017). The part above the diagonal represent the Pearson Correlation while the numbers under the diagonal represent the Spearman correlations.