Transparency and Accounting Standards

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August 2010

Declaration of Originality

I, Dean Katselas, hereby declare that this thesis is the result of original research, and has not been submitted previously for the purpose of obtaining an award, neither at the Australian National University, nor elsewhere.

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Acknowledgements

This thesis would not have been possible without the encouragement and support of a number of people. Professor Tom Smith, my supervisor, whose academic verve has provided me with the motivation and inspiration to pursue academic research in general, and complete this thesis in particular. I thank you for believing in me, and for being the best academic role model possible.

To those who provided valuable feedback along the way, including comments made during my school of FAS presentations, thank you. In particular, Professor Doug Foster, for his excellent feedback and suggestions during the proposal stage.

Finally a big thank you to my family. My life journey has been an interesting one, and you have been the constant in a world of variables. You are my life.

Abstract

This dissertation tests the extent to which International Financial Reporting Standards (IFRS) affect corporate transparency. This association is tested in the context of three factors relevant to transparency; The adverse selection component of the bid-ask spread, the cost of equity capital, and stock return volatility, with each addressed as a separate essay.

The first essay tests whether the global move toward IFRS, leads to a reduction in adverse selection for adopting firms, following adoption. A parsimonious model by Bollen et al. (2004), allows for decomposition of the spread into its respective components; order processing costs, inventory holding costs, and adverse selection costs. As the variable of interest, the Inventory Holding Premium (IHP) is examined surrounding IFRS adoption. Results reveal that the bid-ask spread itself actually increased following adoption across the entire sample, however the adverse selection component, modelled as the IHP, decreased. Restricting the sample to early adopters only and controlling for potential self selection bias, early adopters enjoy a lower bid-ask spread over official adopters, but fail to show any change in adverse selection costs.

The second essay tests the contention that firms that switch to compliance with the IFRS from local generally accepted accounting principles (GAAP) experience a reduction in their cost of equity following the change. Drawing upon an *ex ante* cost of equity measure due to Pastor et al. (2008), and using Easton (2004) for robustness, models developed incorporate a post IFRS

dummy variable, and control for other factors related to the cost of equity. Additionally, tests isolate early adopters and control for self-selection bias. Results provide only weak evidence that the IFRS succeed in reducing the cost of equity, with some mixed results across the specified models. Overall results suggest that in this context, it is possible that early adoption has merits, particularly for firms exhibiting greater visibility afforded by higher analyst following.

Finally essay three tests whether the switch to International Financial Reporting Standards (IFRS), results in a decrease in stock return volatility following adoption. An intuitive cross sectional volatility model is developed which identifies market volatility and β as important factors. Further, given prior research, short-term and long-term effects are predicted to differ, hence separate tests identify the extent of the pre-post windows with this in mind. Results reveal that across the entire sample of adopters, the null of no decrease in stock volatility in the 10 months following adoption, is rejected. Short term tests are less convincing, with all but one specification failing to reject the null. This provides some evidence that the behaviour of stock volatility following this information event differs between the short and long term.

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Chapter 1

Introduction

1.1 Aims and Background

This dissertation examines transparency surrounding a widespread switch in financial reporting regime; the global move toward International Financial Reporting Standards (IFRS). In the absence of any direct measure of transparency, this research will address the issue through three notions relevant to transparency; the adverse selection component of the bid-ask spread, the cost of equity, and stock return volatility. Further, the switch to the IFRS did not only happen uniformly on some mandatory adoption date, but also gradually prior to that point by firms wishing to early adopt. Delineating between these two groups of adopters, namely early and official provides interesting insight into whether the effect changes where a firm adopts in isolation or concurrent with many firms at a given point.

2005 marked a major event in financial reporting, with a number of countries simultaneously requiring financial report preparation pursuant to the

IFRS for reporting periods following 1 January 2005. In 2001, the European Commission proposed that European Union (EU) firms commence reporting under the IFRS in 2005. Consistent with the EU, Australia has also progressively harmonised their domestic standards with the IFRS, with mandatory adoption from 2005, with other countries making a commitment to adopt subsequent to this date. A major reason for harmonising with the IFRS is the ease by which financial comparisons may be draw, and the perceived transparency that results from their application. For example, the following is stated as justifying the EU experience (EC, 2001):

> The Regulation would help eliminate barriers to cross-border trading in securities by ensuring that company accounts throughout the EU are more transparent and can be more easily compared. This would in turn increase market efficiency and reduce the cost of raising capital for firms.

The Australian government appears determined to pursue harmonisation prerogatives, however little empirical evidence exists testing their stated motivations. For instance, Policy Statement PS4 (ASCPA, 2005) suggests that one such benefit of harmonisation entails (ASCPA, 2005: 1436):

> ...removing barriers to international capital flows by reducing differences in financial reporting requirements for participants in international capital markets and by increasing the understanding by foreign investors of Australian financial reports.

In an address to the Securities Institute and the Institute of Chartered Accountants of Australia in 2002, John Howard affirms the following:

> I think you are also aware that the pursuit of a single set of high quality accounting standards has been an objective of the Government going back to the first CLERP initiative. And this recognises that uniform accounting standards, which are accepted in major international capital markets will greatly facilitate cross border comparisons by investors, reduce the cost of capital and assist Australian companies wanting to raise capital or list overseas.

Although the above arguments in support of harmonisation are echoed globally, only indirect, and inconclusive empirical evidence supports the relationship. Consequently, the empirical examination proposed here intends to add credence to the arguments or otherwise in light of the contemporaneous nature of the topic.

Despite the usage of transparency as justification, not only in relation to the EU case, but abroad, little research exists rejecting the null of no increase. Furthermore, a global switch toward a uniform accounting regime provides an interesting opportunity to investigate whether changing account standards has any effect on transparency. Consequently, the overarching research question addressed in this dissertation is:

> Does a switch from domestic to international accounting standards affect corporate transparency?

1.2 Structure

The first essay tests whether the global move toward the IFRS, leads to a reduction in adverse selection for adopting firms, following adoption. A parsimonious model by Bollen et al. (2004), allows for decomposition of the spread into its respective components; order processing costs, inventory holding costs, and adverse selection costs. As the variable of interest, the Inventory Holding Premium (IHP) is examined surrounding IFRS adoption.

Using the Bollen et al. (2004) model as a foundation, a dummy variable is added which assumes a value of 1 in the post-IFRS period, and 0 otherwise. Further, slope coefficients are included which interact the post-IFRS dummy variable, to test the post IFRS effect on these variables. Of particular interest here is the IHP slope dummy, which, as a measure of the adverse selection component of the bid-ask spread, captures any change due to IFRS adoption. Additionally, prior research suggests that firms which voluntarily disclose information, and indeed early adopt into the IFRS, exhibit predictable characteristics (e.g. Ashbaugh and Pincus (2001)). As such, early adopters are isolated, and the association tested in the presence of potential self-selection bias, with a Heckman (1979) two-step procedure.

Data for this essay span 20 countries, and includes 13,610 firm-month observations. Results indicate that across the full sample of adopters, the bid-ask spread actually *increased* following adoption, with the inclusion of a slope dummy term yielding a negative and significant coefficient; namely that the adverse selection component of the spread decreased post-adoption, relative to the pre adoption period. Further tests isolating early adopters from the full sample reveal that for this subset, the spread decreased, with no significant difference in adverse selection cost between the pre and post adoption period. The former effect, however, becomes insignificant upon including a year fixed effect.

The second essay tests the contention that firms that switch to compliance with the IFRS from local generally accepted accounting principles (GAAP) experience a reduction in their cost of equity following the change. This essay draws upon an *ex ante* cost of equity measure due to Pastor et al. (2008), which requires earnings per share (EPS) forecasts for years $t+1$ and $t+2$, and a long term growth forecast to infer $t+3$. The measure goes further, inferring the expected EPS between $t+3$ to $t+15$, by setting the long run nominal GDP rate as the growth rate applicable at $t+T+1$, and imposing an exponential rate of decline from the growth rate in $t+3$ to $t+T+1$, in order to estimate growth rates, and hence expected EPS for the intervening years. Given the complex nature of the measure, the Modified Price-Earnings-Growth (PEG) model of Easton (2004) is used for robustness. As done in the first essay, a dummy variable is used to delineate the pre and post IFRS periods, and a Heckman (1979) two-step procedure is used to control for self-selection associated with early adoption.

Data for this essay span 17 countries, and includes 2,700 firm-month observations. While some evidence is revealed that the cost of equity is reduced by IFRS adoption alone, these results are not consistent across all specifications. However, the *abnormal cost of equity*, measured as the difference between the cost of equity of the sample firm, less the mean of a comparison group, is lower in the post IFRS period for early adopting firms with greater analyst following than before adoption. Interestingly, across both early and official adoptors, this same variable is positive and only weakly significant. Hence, it is possible that early adoption has its merits, particularly for firms exhibiting greater visibility afforded by higher analyst following.

Finally, essay three tests whether the switch to International Financial Reporting Standards (IFRS), results in a decrease in stock return volatility following adoption. An intuitive cross sectional volatility model is developed which identifies market volatility and β as important factors. Further, given prior research, short-term and long-term effects are predicted to differ, hence separate tests identify the extent of the pre-post windows with this in mind.

Data for this essay span 22 countries, and includes 28,540 firm-month observations. Results reveal that across the entire sample of adopters, the null of no decrease in stock volatility in the 10 months following adoption, is rejected. Short term tests are less convincing, with all but one specification failing to reject the null. This provides some evidence that the behaviour of stock volatility following this information event differs, between the short and long term.

Chapter 2

International Accounting Standards, Transparency, and the Cost of Adverse Selection

2.1 Introduction

This chapter tests whether the global move toward International Financial Reporting Standards (IFRS), leads to a reduction in adverse selection costs following adoption, and relative to non-adopters. A parsimonious model by Bollen et al. (2004), allows for decomposition of the spread into its respective components; order processing costs, inventory holding costs, and adverse selection costs. At the crux of the model is the Inventory Holding Premium (IHP), which is the premium required by market makers to compensate for the cost associated with holding inventory until the position is reversed out, and in this light, the risk of encountering an informed trader. The model is a refinement of the ad hoc specifications which preceded it (eg Harris (1994), Stoll (1978) and Tinic (1972)).

With such a means of decomposing the bid-ask spread at hand, the effect of any actions expected to influence adverse selection may be examined. For example, Sidhu et al. (2008) examine the effect of Regulation Fair Disclosure (FD) of adverse selection costs, following its imposition in October 2000 by the SEC. Importantly, they premise their hypothesis on the expected outcome of FD, and whether this affects the market maker's probability of encountering an informed trader. They find that despite the SEC's intention of addressing private information concerns, and that "...the regulation will improve information flow to the *entire* market and remove the opportunity for recipients to trade on the private information", FD in fact *increased* adverse selection costs due to an information "chilling effect" from the analyst community, and a greater probability of a market marker encountering a trader possessing now, more valuable information.

Early research provides some evidence that disclosure policy is inversely related to a firm's bid ask spread. Welker (1995) for example, provides US evidence to this effect, using a firm level disclosure rating data. Although he also predicts that this result be observed for firms expecting a high probability of an information event, the results thereof are insignificant. Much like the predictions of Welker (1995), the IFRS, as a global set of accounting rules, are widely cited as representing qualities promoting information transparency. For as stated within the International Accounting Standards Committee Foundation's (IASCF) constitution, the goal of the IASB is (IASCF, 2005: 3):

> ... to develop in the public interest, a single set of high quality, un-

> derstandable and enforceable accounting standards that require high quality, transparent and comparable information in financial statements and other financial reporting to help participants in the world's capital markets and other users make economic decisions...

Empirical research also lends insight into the quality of IFRS relative to domestic standards. Ashbaugh and Pincus (2001) enquire into the usefulness of IFRS related financial information versus various domestic standards in the context of analyst forecast accuracy, hypothesising that the process of harmonisation with the IFRS increases earnings predictability by reducing the number of accounting choices available globally. Secondly, greater disclosure is associated with a higher degree of analyst forecast accuracy (Lang and Lundholm, 1996). Assuming that the IFRS imply greater disclosure, Ashbaugh and Pincus (2001) suggest that this, coupled with the limitation of available measurement techniques; reduces forecast errors subsequent to adoption.

Bartov et al. (2005) find evidence that the IFRS produce more value relevant information compared to German GAAP. They argue that domestic standards in Germany, being closely aligned to the information requirements surrounding taxation reporting, fail to consider the informational requirements of capital market actors. Irrespective of the standards used, actual cash flows represent unbiased economic results. Accrual accounting imposes adjustments to the cash flows dependent of the substance of the standards in use. In light of the worldwide differences in accounting regimes and supporting institutions, the relevance thereof varies, and is not necessarily aligned to the needs of a global capital market.

> Different sets of accounting standards (each devised as a function if their respective environments) as well as differences in enforcement determine the limits on differences of reported earnings for the same economic results. Differences in objectives of reported financial information and opportunistic use of accruals by management could result in varying levels of value relevance of earnings as reflected in the statistical association between earnings and stock returns (Bartov, Goldberg, and Kim, 2005: 98).

That being said, the empirical predictions of Welker (1995) provide a foundation for predicting the effect of the IFRS on adverse selection. The IFRS however, do provide a different angle to transparency than merely disclosure *per se*. As mentioned, one end of a single set of global standards on financial reporting is to promote comparability; the notion that earnings figures, for example, are calculated on a similar basis globally. Taking the basic argument of Welker (1995) that following an increase in disclosure, adverse selection costs and hence the bid-ask spread are lower, provides the foundation. Indeed within an environment governed by relatively opaque accounting rules, there exists a greater likelihood of the market maker encountering a trader endowed with private information. One may view such an environment as exhibiting a low level of information diffusion, increasing the value of private information to informed traders. In this vein, the argument posited by Sidhu et al. (2008) in relation to the deleterious effect of

FD on adverse selection costs provides relevance. The effect of FD according to Sidhu et al. (2008) was to curtail the dissemination of otherwise private information by firms to analysts and hence to the market, resulting in more valuable and longer lived private information.

The IFRS, arguably, have the opposite effect. The standards in many cases, would result in more information dissemination than would otherwise be the case under domestic standards. This may produce an outcome of bringing to the public light otherwise private information, reducing the probability of encountering an informed trader, and hence the adverse selection cost of the bid-ask spread. Results indicate that across the full sample of adopters, the bid-ask spread actually *increased* following adoption, with the inclusion of a slope dummy term yielding a negative and significant coefficient; namely that the adverse selection component of the spread decreased post-adoption, relative to the pre adoption period. Further tests isolating early adopters from the full sample reveal that for this subset, the spread decreased, with no significant difference in adverse selection cost between the pre and post adoption period.

This chapter is structured as follows. Section 2 details the various components of the bid ask spread; order processing costs, inventory holding cost, and adverse selection cost. Section 3 provides a brief derivation of the inventory holding premium, the adverse selection measure used in this paper. Sections 4 and 5 specify the empirical model and data respectively. Section 6 details the results, and section 7 concludes.

2.2 Determinants of the bid-ask spread

The functional relationship between the bid-ask spread and its determinants remains an important field of enquiry within the discipline of finance. As a reflection of the cost of trading, and illiquidity of the market, the spread represents the difference between what active buyers and sellers pay and receive respectively (Stoll, 2004). In addition to the fixed cost component of conducting a trade, involvement of a market maker brings to light additional risk factors, for which the market maker demands a higher return, consequently affecting the bid-ask spread. Therefore, the market maker will set the spread at a level reflective of the risk and costs associated with completing the trade, and ultimately closing out the position.

The costs incurred by the market maker fall into three categories; order-processing costs, the inventory holding premium, and the cost of adverse selection (Stoll, 2004, 1978). Bollen et al. (2004) also suggest that the involvement of multiple market makers induces price competition on setting the spread. Each of these components are discussed.

2.2.1 Order processing costs

Order processing costs (OPC) are those directly related to facilitating and executing trade, and include floor space rent, the exchange seat, information technology, the opportunity cost of time, and labour Bollen et al. (2004). Such costs are largely fixed, implying that order processing costs, at the margin, decrease with trading volume. Following on from this, a number of empirical studies proxy order processing costs based trading volume or some variant (e.g. Branch and Freed (1977), who use trading volume, Tinic (1972), Tinic and West (1974, 1972), Stoll (1978) and Harris (1994), who use the log of trading volume, with Harris (1994) also measuring OPC as $\frac{1}{NT^2}$. Given that the contribution of OPC to the spread decreases with trading volume, a negative sign is predicted for this relationship, with the exception of the inverse measure, which is predicted to be positive.

2.2.2 Inventory-holding cost

Market makers, in providing liquidity, bear risk due to price change volatility potentially affecting inventory value until the position is closed out. The market maker hence prices this risk in the bid-ask spread. Naturally, the longer such stock is expected to be held in inventory, the higher the risk, and hence greater the cost. Proxies for inventory holding cost have previously fallen into one of two categories; those that proxy for the transaction or turnover rate (Demsetz, 1968), or those that attempt to capture the expected volatility during the holding period (for example Tinic (1972) who uses standard deviation of price, and Stoll (1978) and Harris (1994) who proxy inventory holding costs by historical return volatility.

2.2.3 Adverse selection cost

Market makers supply immediacy to the market, and are generally unaware of whether the investor with which he or she is transacting is better informed or not. The market maker will lose in the event that a trade takes place with a better informed investor (Stoll, 2004). The rationale behind this is as follows. The existence of private information before the trade, which is revealed after the trade takes place, adversely affects the value of inventory held by the market maker. To paraphrase, in trading with an informed investor, the market maker is, unknowingly buying (selling) for more (less) than the value of the stock.

Empirical proxies for the adverse selection cost are far from precise, but generally attempt to capture facets of a firm's information environment. For example, Harris (1994) posit that larger firms, as measured by market capitalisation, have a greater level of information disseminated to the market, which in turn lowers the probability of adverse selection. Finally, Easley et al. (1996), following a similar line of argument, suggest that the higher the trading volume, the greater the involvement of informed traders, and hence the lower the adverse selection. As such, any means which reduce the level of information asymmetry, have the potential to reduce the bid-ask spread.

Although economic reasoning may provide a convincing argument supporting the association between adverse selection and the bid-ask spread, Glosten and Milgrom (1985) provide an intuitive analytical interpretation (Stoll, 2004). Take the case of an individual asset, which can only assume one of two values, either v^H (a high value), or v^L a low value. Either value has an equal probability of occurrence, and only informed investors know the true value. Also assume that the probability of the market maker encountering an informed investor is π. Since uninformed investors can only estimate the value of the asset given the expectation of equal probability of either outcome, and assuming risk neutrality, the expected value held by uninformed investors is $\bar{v} = (v^H + v^L)/2$. Given that the market maker is only aware of the equally likely outcomes v^H and v^L, and hence $\bar{v}$, the ask price becomes the expected value $\bar{v}$ conditional on trade at the ask price. Given the probability of an informed trade, the market maker will demand anywhere between $\bar{v}$ and v^H, when the probability is zero and one respectively, or expressed algebraically:

$$A = v^H \pi + \bar{v}(1 - \pi) \tag{2.1}$$

Conversely, the market maker is willing to buy at a bid price from the expected value $\bar{v}$ down to v^L, or in other words, is willing to sell for the lowest value, given a high probability of an informed trade:

$$B = v^L \pi + \bar{v}(1 - \pi) \tag{2.2}$$

Expressed in terms of the bid-ask spread:

$$A - B = \pi(v^H - v^L) \tag{2.3}$$

Hence, the impact of the probability of an informed trade becomes clear. The market maker will set a higher ask, and a lower bid price, to compensate for the risk of encountering an informed trader. Given the position held in prior literature, firms operating in a rich information environment should present investors with a lower risk of adverse selection, and reduce the bid-ask spread as illustrated above.

2.3 Functional form: The inventory holding premium

Given the factors suggested by Stoll (1978), the functional form of any model with the bid-ask spread on the left hand side, should utilise empirical proxies for order processing costs (OPC), the inventory holding premium (IHP), and adverse selection costs (ASC). Bollen et al. (2004) further suggest that the existence of multiple market makers induces price competition and hence downward pressure on the spread. Upon adding competition[1], the functional form of such a model becomes:

$$SPRD_i = f(OPC_i, IHC_i, ASC_i, COMP) \tag{2.4}$$

Where $SPRD_i$ is the bid-ask spread for firm i, OPC_i, IHC_i and ASC_i are as defined above, for firm i, and $COMP$ is the competition proxy.

[1]Bollen et al. (2004) suggest that a Herfindahl index of concentration be used to proxy for competition. The measure is $HI = \sum_{j=1}^{NM} \left(\frac{V_j}{TV}\right)^2$ where V_j is the volume traded by market maker j, and TV is the total volume traded by all market markers across the market.

The market maker may be required to accommodate a customer buy or sell order, and consequently enter a long or short position in a given stock (Figures 2.1 and 2.2 respectively). The market maker hence assumes a risk that the market value of the position may change before it is ultimately reversed out (Figure 2.3 in the case where the market maker enters a short position). A potential means of hedging against such a movement, in the event that the dealer assumes a long position to accommodate an order, is to short an optimal number of futures contracts, ascertained as:

$$Min\ E[(\Delta S + n_F \Delta F)^2] \tag{2.5}$$

$\triangle S$ is the change in the stock price S, n_F is the hedge ratio, and $\triangle F$ is the change in the futures price F. The paucity of futures contracts necessary to meet the idiosyncratic nature of each dealer position, means that futures do not provide a practical hedging instrument. Given this, Bollen et al. (2004) state that the inventory holding premium is more generally stated as:

$$Min\ E[(\Delta S + IHP|\Delta S < 0)^2] \tag{2.6}$$

Solving for the first-order condition, setting it equal to zero, and rearranging to solve for the IHP:

$$IHP = -E(\Delta S|\Delta S < 0)Pr(\Delta S < 0) \tag{2.7}$$

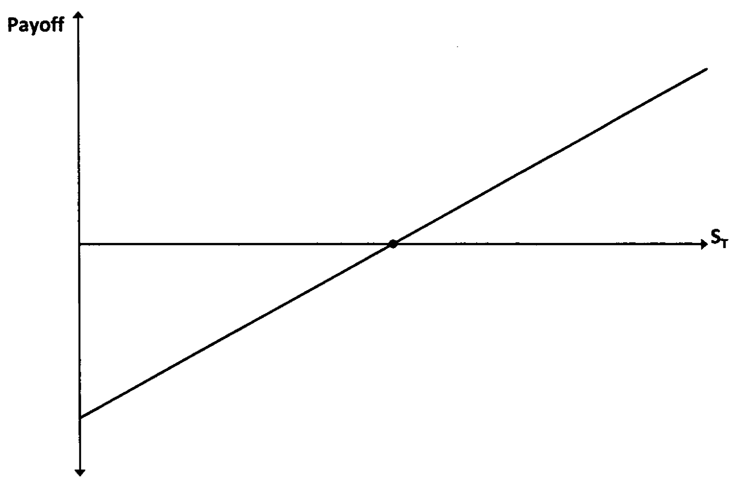

Figure 2.1 – Payoff structure of going long a stock

Equation 2.7 suggests that the risk of an adverse movement is modeled as the lower semi variance. Hence, in order to compensate for this cost, at minimum, the IHP is the expected negative movement in the stock price, conditional on a decrease, multiplied by the probability of a negative movement. Bollen et al. (2004) state that in the case of the market maker buying at the bid, a means of managing this risk is to buy an at-the-money put option, or conversely an at-the-money call option (Figure 2.4), in the case of selling at the ask (Figure 2.5). Although similar to the case with futures contracts, options don't necessarily provide a viable hedging instrument in a practical sense, they do however provide a parsimonious means of pricing the inventory holding premium and adverse selection cost.

Premised on the Black and Scholes (1973) and Merton (1973) option

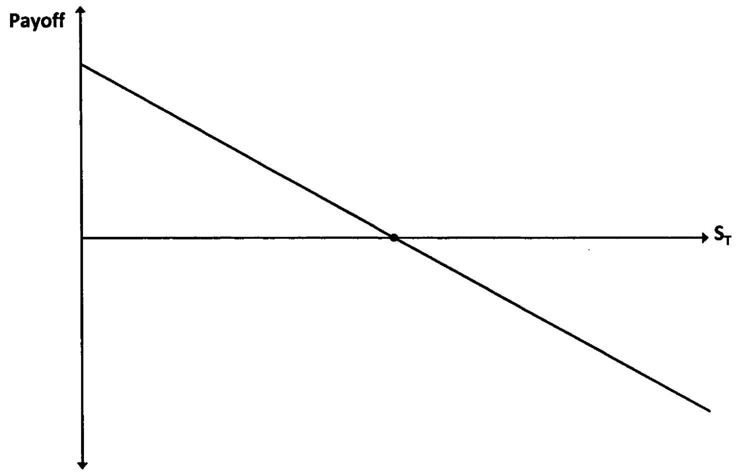

Figure 2.2 – Payoff structure of going short a stock

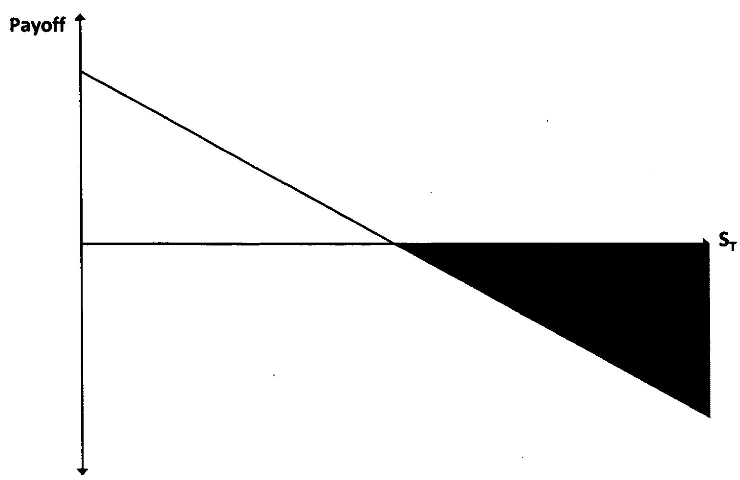

Figure 2.3 – Market maker's exposure when they execute a trade at the ask price

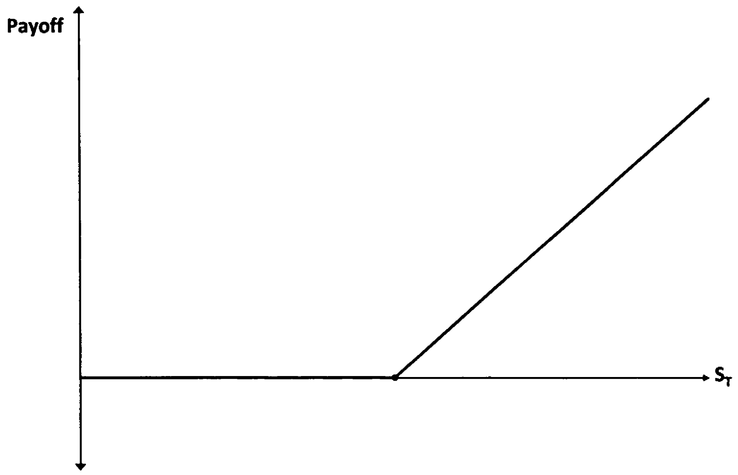

Figure 2.4 – Call option payoff structure

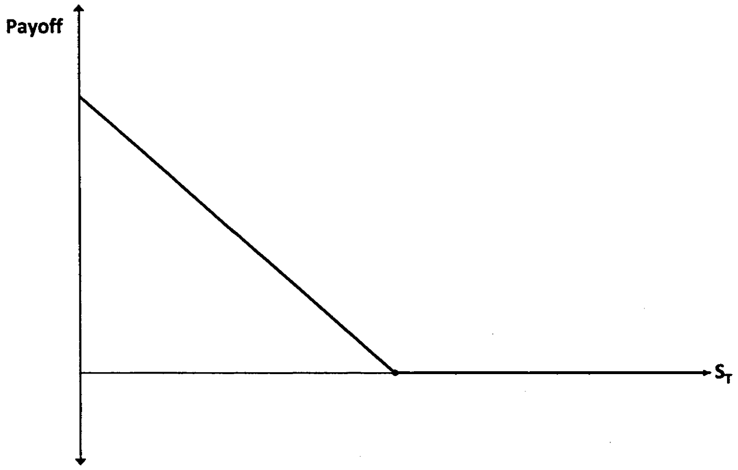

Figure 2.5 – Market maker's hedge position when executing a trade at the ask price, and holding a call option until the time of an offsetting trade

pricing models, Bollen et al. (2004), in the case where the market maker takes a short position and hence requires a call option as a theoretical hedging instrument, put forth the following expression:

$$IHP = SN\left(\frac{ln(S/X)}{\sigma\sqrt{t}} + 0.5\sigma\sqrt{t}\right) - XN\left(\frac{ln(S/X)}{\sigma\sqrt{t}} - 0.5\sigma\sqrt{t}\right) \quad (2.8)$$

Recalling that the appropriate instrument is an at-the-money call option with t time to expiration, Equation 2.8 reduces to:

$$IHP = S[2N(0.5\sigma\sqrt{t}) - 1] \quad (2.9)$$

and given that the time frame over which the position is open t is stochastic, the expression for the IHP becomes:

$$\widetilde{IHP} = S[2N(0.5\sigma E\widetilde{\sqrt{t}}) - 1] \quad (2.10)$$

The IHP expression in Equation 2.10 requires only three variables for calculation; the stock price at the time that the position is opened, the historical volatility of the stock, and the time between offsetting trades t. In order to gauge t, data is required which provide a historical idea of the typical length of time before an offsetting trade enables the position to be closed. As will be established later in the paper, daily trade volume will used to estimate the average number of minutes between trades on a given day. Intraday data however, if available, may be used to make a more direct estimate.

2.4 Empirical model

The purpose of this study is to ascertain whether the adoption of IFRS have resulted in a decrease in adverse selection, hence, this section develops the models necessary to test this effect. In so doing, the approach taken by Sidhu et al. (2008) is adopted here, using the firm specific IFRS adoption date as the point of interest.

Recall the various components of the bid-ask spread discussed in Section 2.2; order processing costs, inventory holding costs, and adverse selection costs. In developing the required model, the model of Bollen et al. (2004) is firstly used as a starting point, which states that the spread is a function of the aforementioned three components in the following form:

$$SPRD_i = \alpha_0 + \alpha_1 InvTV_i + \alpha_2 IHP_i + \alpha_3 MHI_i + \epsilon_i \qquad (2.11)$$

Where:

$SPRD_{it}$ = the bid-ask spread for firm i at time t

$InvTV_{it}$ = the inverse of trading volume for firm i at time t; and

IHP_{it} = the inverse of trading volume for firm i at time t, ascertained by Equation 2.10.

MHI_i = the modified Herfindahl index as per Bollen et al. (2004)[2]

Next, to test whether switching to the IFRS affected the spread itself, a dummy variable assuming a value of 0 in the pre adoption period, and 1 post IFRS adoption, is added to the specification. Furthermore, to isolate an effect on adverse selection following adoption, slope dummy terms, comprising $InvTV$ and IHP each interacted with the pre-post dummy D, are also added. The empirical model tested in this paper hence becomes:

$$
\begin{aligned}
SPRD_{it} &= \alpha_0 + \alpha_1 InvTV_i + \alpha_2 IHP_i + \alpha_3 D_t + \alpha_4 InvTV_i D_t \\
&\quad + \alpha_5 IHP_i D_t + \epsilon_i
\end{aligned} \tag{2.12}
$$

Where:

$SPRD_{it}$ = the bid-ask spread for firm i at time t

$InvTV_{it}$ = the inverse of trading volume for firm i at time t

IHP_{it} = the inverse of trading volume for firm i at time t, ascertained by Equation 2.10; and

D_{it} = a dummy variable assuming a value of 0 in the pre, and 1 in the post adoption period, for firm i at time t.

[2] Although Bollen et al. (2004) include MHI to account for competition among market makers, this variable is dropped in the analyses that follow. This variable is likely to be insignificant in competitive markets, which is assumed to be the case here

According to Bollen et al. (2004) a positive sign is predicted for α_1. Order processing costs are largely fixed, hence the order processing costs per market maker decrease as trading volume increases. As per Bollen et al. (2004), as the inverse of trading volume increases, implying that as the proxy for order processing costs approaches zero, the spread decreases. Secondly, as has been established, inventory holding and adverse selection costs have a positive relation with the spread. Therefore, the coefficient on the proxy for these components, the IHP, is predicted to have a positive sign. Of particular interest upon estimating Equation 2.12 are coefficients α_3 and α_5, which indicate the post-adoption effect on the bid-ask spread, and importantly the interaction term IHP_iD_t, a slope dummy term, which indicates the effect on the adverse selection component of the spread, respectively.

Several variants of Equation 2.12 are tested to account for the effects of country and time. Firstly, two country level variables are added to Equation 2.12 which are likely to affect the probability of the market maker encountering an informed trader. Firstly, a disclosure index score by CIFAR (1995) to control for the pre-adoption information environment by country. As discussed, the lower the required disclosure in a given country, the lower the level of desseminated public information. Secondly, a country level corruption index score, as adopted by La Porta et al. (2006), is included. The higher the rated prevalence of corruption in a given country, the higher the probability that one may encounter an informed trader, due to the greater incidence of insider trading. Incorporation of the above into 2.12 results in the following specification:

$$
\begin{aligned}
SPRD_{it} &= \alpha_0 + \alpha_1 InvTV_i + \alpha_2 IHP_i + \alpha_3 D_t + \alpha_4 InvTV_i D_t \qquad (2.13)\\
&\quad + \alpha_5 IHP_i D_t + \alpha_6 DISCLOSE_i + \alpha_7 CORRUPT_i + \epsilon_i
\end{aligned}
$$

Where:

$SPRD_{it} =$ the bid-ask spread for firm i at time t

$InvTV_{it} =$ the inverse of trading volume for firm i at time t

$IHP_{it} =$ the inverse of trading volume for firm i at time t, ascertained by Equation 2.10

$D_{it} =$ a dummy variable assuming a value of 0 in the pre, and 1 in the post adoption period, for firm i at time t

$DISCLOSE =$ a disclosure index score obtained from CIFAR (1995); and

$CORRUPT =$ a corruption index score, as per La Porta et al. (1998).

Finally, three fixed effects models (country, year, and both country and year), are tested.

The above specifications denoted by Equations 2.12 and 2.13 imply inclusion of all adopters, irrespective of whether a firm is an early adopter, or adopted the standards in line with an official, country wide, adoption date. Being an exercise in voluntary disclosure, firms which early adopt into the IFRS, may be assumed to do so based on similar grounds and motivations as firms who voluntarily disclose generally. That being said, there may be characteristics of early adopters, which prompt such firms to self select into early adoption of the IFRS regime. Such a self selection problem creates an omitted variable problem, which may arise due to private information associated with self selection (Li and Prabhala, 2007). The following section presents the method used herein to account for this issue.

2.4.1 Self Selection Bias

Originating with Heckman (1979), the notion of self-selection may be viewed as giving rise to an omitted variable problem. Li and Prabhala (2007) illustrate this as follows. Assume that the following regression requires estimation:

$$Y_i = X_i\beta + \epsilon_i \tag{2.14}$$

Assume now, that a sub-sample of firms self selects into choice E. For this sub-sample of firms, the applicable regression equation becomes:

$$Y_i|E = X_i\beta + \epsilon_i|E \tag{2.15}$$

As the self-selected sub sample is not random, failure to account for self-selection results in inconsistent β estimators. In correcting for self selection bias, the first step requires identification of factors likely to explain the decision to self-select. I.e:

$$E \equiv W_i = Z_i\gamma + \eta_i > 0 \tag{2.16}$$

Where W_i is the selection variable, typically a dichotomous variable denoted as 1 for selection, and 0 otherwise. Z_i is a vector of public exogenous variables, γ is a vector of coefficients, and η_i is an error term orthogonal to γ. It therefore implies that the equivalent expression for non-selection, NE, is as follows:

$$NE \equiv W_i = Z_i\gamma + \eta_i \leq 0 \tag{2.17}$$

Therefore, to estimate Equation 2.14 in the presence of self selection, and taking its expectation, and substituting in 2.16, the expression becomes:

$$\begin{aligned} Y_i|E &= X_i\beta + (\epsilon_i|Z_i\gamma + \eta_i > 0) \\ &= X_i\beta + \pi(\epsilon_i|Z_i\gamma + \eta_i > 0) + v_i \end{aligned} \tag{2.18}$$

The expression in 2.18 follows from the notion that $\epsilon_i|\eta_i = \pi\eta_i + v_i$, a regression of ϵ_i on η_i, where π is therefore the coefficient, and v_i is the orthogonal error term. An equivalent expression for firms which do not self select into the choice under investigation may similarly be derived, by substituting Equation 2.17 into Equation 2.14. Taking expectations, and denoting the second term in Equation 2.18 as $\lambda_C(Z_i\gamma)$, Li and Prabhala (2007) present the following expression, which captures the essence of Heckman (1979):

$$E(Y_i|C) = X_i\beta + \pi\lambda_C(Z_i\gamma) \tag{2.19}$$

Where π is the coefficient on the *inverse mills ratio*, and C denotes the choice to self select, or otherwise, by the firm. Examination of 2.19 clearly reveals the omitted variable problem. Estimation of 2.14 omits the final term in Equation 2.19, which arises due to a subset of firms self selecting into a given choice. Voluntary adoption into a particular disclosure regime, or in this case, early adoption, provides a classic example of the self selection problem. Therefore, a 2-step Heckman estimation to account for potential self selection bias requires, in addition to a vector of explanatory variables X_i, but also a vector Z_i of public variables which, according to theory, are expected to predict the self selection decision. The following section elaborates the choice of Z_i as applicable to this chapter; firm specific variables associated with early IFRS adoption.

Early adoption: Probit model to account for self-selection

Much of the literature in accounting suggests systematic characteristics of firms which essentially opt in, or voluntarily provide financial disclosure above a minimum requirement. For example, Healy et al. (1999) finds that firms that intend on raising external capital within the United States provide additional voluntary disclosure prior to the issuance. Further, firms which have higher visibility are more inclined to provide voluntary disclosure. For example, large firms tend to be more transparent (Ahmed and Courtis, 1999; Lang and Lundholm, 1993), as do firms which are cross-listed (Lang et al. 2003).

International evidence tends to reveal similar results at the global level, albeit with external dependence emerging as a consistently important factor. Ashbaugh (2001) for instance, finds that the choice to voluntarily report under either the international accounting standards (IAS) or United States

(US) Generally Accepted Accounting Principles (GAAP), by non-US firms is associated with the number of foreign listings, the existence of a forthcoming stock issuance, and the transparency afforded by the extant domestic standards. Furthermore, Dumontier and Raffournier (1998), El-Gazzar et al. (1999), Murphy (1999), and Cuijpers and Buijink (2005), all find that the dispersion of foreign operations is highly associated with the decision to adopt non-local GAAP, in accord with the notion that such firms exhibit heterogeneity in their stakeholder base.

Prior empirical literature specifically examining the decision to voluntarily opt into the IFRS regime, follows the above. Hung and Subramanyam (2007), in examining the shift of German firms to the IFRS, control for potential self-selection bias by running a probit regression of the decision to voluntarily adopt, on return on assets, leverage, size, cross listing, increase in common stock, increase in long term debt, and industry and year dummies. Consistent with the prior studies, the size coefficient is positive and highly significant. Based on the visibility and foreign dependence arguments, the following first-stage regression is specified:

$$\begin{aligned} C_i &= \beta_0 + \beta_1 LNSIZE_{it} + \beta_2 EPS_{it} + \beta_3 FSALES_{it} \\ &\quad + \beta_4 LISTINGS_{it} + \beta_5 NUMEST_{it} + \beta_6 DISCLOSE_i \\ &\quad + \beta_7 CORRUPT_i + \epsilon_{it} \end{aligned} \tag{2.20}$$

Where:

$C_i =$ A dichotomous variable assuming a value of 1 if the firm is a voluntary adopter, or 0 otherwise.

$LNSIZE_{it} =$ The natural log of size for i at time t

$EPS_{it} =$ Earnings per share for firm i at time t

$FSALES_{it} =$ Foreign sales as a proportion of total sales for firm i at time t

$LISTINGS_{it} =$ The number of foreign listings for firm i at time t

$NUMEST_{it} =$ The number of analysts following firm i at time t

$DISCLOSE_i =$ Local GAAP based disclosure/transparency score for firm i

$CORRUPT =$ a corruption index score, as per La Porta et al. (1998).

Time t denotes the time of the switch to the IFRS, or more specifically, the most recent data prior to adoption.

2.5 Data

As a starting point, accounting standard regime adoption data, as reporting in the notes to the annual financial statements were obtained from Worldscope. The initial sample consisted of all firms covered by Worldscope, for which an identifiable shift from domestic standards to the IFRS during the period 1998-2008, is observed. Although adoption prior to this period was indeed possible, Epstein and Mirza (2004) note that the period surrounding and following the push toward IOSCO endorsement, and the improved additions to the standards standards rolled out in 1998 to meet IOSCO requirements, provides a landmark move toward quality and acceptance of the standards. After removing observations for which no firms are reported to be IFRS firms in a given country, the remaining sample on standards adoption is 18,761 firms. The year of the switch is identified as the first instance of IFRS reporting noted by Worldscope, provided the year prior is specified as reporting under domestic standards. Unavailability of data regarding IFRS adoption in a given year preceded by domestic standards in the year before was deemed insufficient data to conclude an initial switch, hence such firms are excluded from the sample of adopters. The final sample of adopters is 5856 firms, 571 of which being early adopters [3].

Next, data is obtained for each of the variables necessary for the aforementioned regression specifications in general, and the inventory holding premium in particular. Daily bid, ask, return, trading volume, and stock price data are obtained from Thompson Datastream. The expected volatility rate σ, is measured as return volatility over the prior 60 trading days, annualised. The square root of the time between trades $\sqrt{t}$ is inferred from daily trading volume. Assuming trades are in round lots of 100 shares, and the existence of 390 trading minutes in a given day, as $390/trades$, which gives the trading frequency in minutes. To maintain consistency with annualised volatility, the time between trades is also annualised.

Data is required for the 5 months prior to the adoption month (pre-IFRS observations), and the 5 months after adoption (post-IFRS observations). Based on this requirement, the initial sample is 58,560 firm-month obser-

[3] A number of sources were consulted in order to ascertain official adoption information by country, however http://www.iasplus.com (Deloitte), provided a vast majority of this data.

vations. Any firm which has insufficient data in order to form exactly 5 pre-IFRS and 5 post-IFRS observations as stated above, is removed from the sample. This restriction effectively reduced the sample to 1361 unique IFRS adopters, and hence 13610 firm-month observations; being 6805 pre-IFRS and 6805 post-IFRS.

In order to estimate the models necessitating the DISCLOSURE and CORRUPT variables, CIFAR (1995) and La Porta et al. (1998) respectively, provide these measures. To estimate the probit specification required for self-selection correction, data on market capitalisation, earnings per share, foreign sales, and the number of foreign listings, were collected from Worldscope, and number of analysts was obtained from I/B/E/S.

2.6 Results

The effect of IFRS adoption on the cost of adverse selection is analysed as follows. The data is firstly stratified between the pre and post IFRS adoption data points, with descriptive statistics on the IHP and its components reported. Secondly, a linear model is estimated, regressing the bid ask spread on each of its components, as well as these components interacted with the event dummy variable. This model enables isolation of the pre and post effect components on the spread itself. Finally, a self selection model is estimated, to establish whether the effect is observable against a matched sample of non adopters, and official adopters, respectively.

2.6.1 Descriptive Statistics

Table 2.1 reports descriptive statistics by country, for the spread, the IHP, and components thereof. As expected, there appears to be some level of variation across markets. For example, Switzerland and Denmark report spreads of 0.5153 and 0.4856 respectively, and at the lower end, New Zealand, Australia and China, with 0.0169, 0.0353 and 0.0376 respectively. These figures are, of course, relative to average stock price, with the aforementioned countries also reporting the highest and lowers average stock prices across countries. Trading volume is on average, 1.15 million in New Zealand and Austria at the lowest, with a mean of 13,657.

At 0.6884, China reports the highest stock volatility across all reported countries. Most countries however, fall between 0.3 and 0.4. Notable exceptions include Germany and Austria, at 0.5151 and 0.5561 respectively, and Great Britain, which exhibits a volatility of 0.5335. Finally, countries which show the lowest mean stock volatility include Spain (0.2283), Portugal (0.2409), and Italy (0.2596). Finally, the IHP ranges in magnitude from 0.0007 and 0.0027 for New Zealand and Australia respectively, to 0.0747 and 0.0341 for Austria and China respectively. Apart from these extremes, all remaining countries fall within reasonable limits, consistent with Bollen et al. (2004).

Changing focus from country level mean values to a comparison of pre-IFRS and post-IFRS statistics (Table 2.2) reveals that that bid-ask spread actually marginally increased following a switch to the IFRS. This however, appears to be in line with the increase in stock price, which is reported in the post-IFRS period. Stock volatility, decreased from 0.4035 in the pre-IFRS period, to 0.3751 in the post-IFRS period. Finally, although the IHP appears to have increased from 0.0094 to 0.0099 in the post-IFRS period, it would be reasonable to view this as being economically insignificant.

Table 2.3 provides a summary of cross correlations, presented by time period relative to IFRS adoption. As expected, $INVTV$, the inverse of trade volume, is highly correlated with TT, which is the average time between trades in minutes. Further, IHP is negatively correlated with trade volume TV, and positively correlated with TT. This makes sense, as the latter two factors are cited as being related to adverse selection, and bear this association in both /citetBSW04 and /citetSSWW08.

Table 2.1 – Descriptive Statistics by Country

$SPRD$ is the bid-ask spread, S is the stock price, measured as the midpoint between the bid and ask, TV is the average number of shares traded over a month, $ANNVOL$ is stock volatility, calculated as the standard deviation of stock returns in the 60 trading days prior to the current month, TT is the time between trade in minutes, and IHP is the inventory holding premium.

Country	Variable	n	Mean	StDev	Min	Max	Q1	Median	Q3	Q3-Q1
AT	SPRD	30	0.6358	0.2804	0.1523	1.2095	0.3843	0.6468	0.7568	0.3726
	S	30	27.9551	15.089	3.1404	56.7685	12.6573	29.7254	41.3591	28.7018
	TV	30	13652.9	29640.9	1304.76	156281	2140.91	4782.09	7736.36	5595.45
	ANNVOL	30	0.5561	0.2222	0.203	1.1317	0.3956	0.5203	0.6703	0.2747
	TT	30	3.3309	1.4103	0.7848	5.5842	2.3298	3.2169	4.3919	2.0621
	IHP	30	0.0747	0.0468	0.0074	0.1609	0.0277	0.0804	0.1115	0.0838
AU	SPRD	4050	0.0353	0.0443	0.0004	0.5595	0.0112	0.0214	0.0423	0.0311
	S	4050	3.4179	6.4981	0.0104	77.5974	0.6022	1.4032	3.4893	2.887
	TV	4050	464875	518493	9725	2388236	108576	252106	618100	509524
	ANNVOL	4050	0.4557	0.2349	0.0412	1.2472	0.2738	0.4063	0.5883	0.3145
	TT	4050	1.7035	1.1495	0.3463	5.6864	0.8303	1.3606	2.2747	1.4445
	IHP	4050	0.0027	0.0053	0	0.0774	0.0005	0.0012	0.003	0.0024
BE	SPRD	520	0.1951	0.1742	0.0167	1.248	0.0873	0.144	0.2398	0.1526
	S	520	23.4205	22.0758	1.7764	117.25	7.836	17.0082	30.9563	23.1203
	TV	520	71710.3	197749	1242.86	1541115	4052.38	8962.5	31646.7	27594.3
	ANNVOL	520	0.2896	0.1418	0.0347	0.9	0.194	0.2639	0.3462	0.1523
	TT	520	2.4817	1.5492	0.1308	5.6815	1.1982	2.361	3.8315	2.6333
	IHP	520	0.0195	0.0203	0.0006	0.1509	0.0062	0.0133	0.0246	0.0184
CH	SPRD	40	0.5153	0.2724	0.1674	1.4456	0.3349	0.4528	0.6745	0.3396
	S	40	52.9057	38.7759	14.3444	125.964	25.4563	32.4036	75.9255	50.4692
	TV	40	66639	94055	4377.27	374645	10499.7	17532.9	104968	94467.8
	ANNVOL	40	0.3308	0.1114	0.1307	0.6906	0.2537	0.3198	0.404	0.1503
	TT	40	1.7709	0.9689	0.286	4.0373	0.7212	1.9153	2.3858	1.6645
	IHP	40	0.0341	0.0218	0.01	0.0873	0.0193	0.0242	0.044	0.0247
CN	SPRD	80	0.0376	0.0271	0.0037	0.1411	0.0174	0.0288	0.0548	0.0375
	S	80	2.1556	1.3405	0.1968	6.6543	1.2135	2.1154	2.6388	1.4254
	TV	80	360413	418403	3847.06	1913900	67683.9	182886	511411	443727

	ANNVOL	80	0.6884	0.2115	0.3057	1.2341	0.536	0.6416	0.8371	0.3011
	TT	80	0.9955	1.0226	0.1462	5.0198	0.3261	0.6359	1.2328	0.9067
	IHP	80	0.0023	0.0029	0.0001	0.0139	0.0005	0.0013	0.0024	0.0018
DE	SPRD	1900	0.162	0.1277	0.0124	0.9261	0.0736	0.126	0.2086	0.135
	S	1900	11.3447	11.6531	0.1532	82.8853	3.1153	7.7088	14.6503	11.535
	TV	1900	22079.3	49018.5	1125	946855	3965	7968.57	19760.6	15795.6
	ANNVOL	1900	0.5151	0.2466	0.0159	1.248	0.3206	0.4727	0.6602	0.3396
	TT	1900	2.5756	1.4129	0.186	5.6741	1.4322	2.3326	3.6256	2.1934
	IHP	1900	0.0169	0.0164	0.0002	0.152	0.0055	0.012	0.0229	0.0174
DK	SPRD	270	0.4856	0.3313	0.0038	1.6905	0.21	0.4342	0.7	0.49
	S	270	49.0934	32.566	0.2635	118.819	23.3469	46.6114	76.3167	52.9698
	TV	270	207062	404468	1809.09	2200257	14036.4	32078.6	148465	134429
	ANNVOL	270	0.3621	0.2064	0.0511	1.1812	0.2107	0.303	0.4565	0.2459
	TT	270	1.3589	0.9422	0.1127	5.0023	0.5639	1.2565	1.9982	1.4343
	IHP	270	0.0308	0.0312	0.0001	0.1458	0.0071	0.0187	0.0451	0.038
ES	SPRD	780	0.0556	0.0779	0.002	0.577	0.0172	0.0291	0.0576	0.0404
	S	780	10.2735	10.2919	0.4778	51.94	3.021	6.9157	13.1752	10.1542
	TV	780	327297	442550	1231.82	2192605	31229.2	123007	452360	421131
	ANNVOL	780	0.2283	0.1122	0.0333	0.8672	0.1604	0.199	0.2697	0.1094
	TT	780	1.0244	1.1429	0.118	5.6119	0.275	0.5487	1.2368	0.9617
	IHP	780	0.0037	0.0068	0.0001	0.0519	0.0005	0.0011	0.0033	0.0028
FI	SPRD	880	0.0587	0.0534	0.0076	0.585	0.024	0.046	0.0754	0.0513
	S	880	5.7358	4.8853	0.129	25.038	1.7934	4.9683	7.9752	6.1818
	TV	880	143490	256175	1400	2288260	14704	45992.6	165809	151105
	ANNVOL	880	0.372	0.1945	0.1011	1.2013	0.2345	0.3212	0.4485	0.2141
	TT	880	1.6583	1.3217	0.1132	5.6689	0.569	1.3088	2.3746	1.8055
	IHP	880	0.0044	0.0064	0.0001	0.0606	0.0009	0.0023	0.0053	0.0044
FR	SPRD	2560	0.163	0.1616	0.0015	1.4136	0.056	0.1109	0.2095	0.1535
	S	2560	22.2399	20.7284	0.1774	126.083	6.0115	15.8698	33.2196	27.2082
	TV	2560	158428	365976	1042.86	2268423	5614.52	14606.7	79354.2	73739.6
	ANNVOL	2560	0.3532	0.1835	0.0591	1.1674	0.2255	0.304	0.4298	0.2042
	TT	2560	2.1496	1.5964	0.1087	5.6888	0.7251	1.8691	3.3447	2.6195
	IHP	2560	0.0184	0.0222	0.0001	0.1576	0.0036	0.01	0.024	0.0204
GB	SPRD	20	0.0587	0.0192	0.0285	0.0791	0.0405	0.0634	0.077	0.0365

	S	20	2.9783	0.5922	2.0295	4.1373	2.6296	2.8842	3.3843	0.7546
	TV	20	473644	591962	18468.2	2283455	36909.5	227478	816512	779602
	ANNVOL	20	0.5335	0.1204	0.3032	0.7614	0.4651	0.557	0.6199	0.1548
	TT	20	0.6466	0.4372	0.123	1.4566	0.259	0.514	1.0532	0.7942
	IHP	20	0.0018	0.0014	0.0002	0.0041	0.0005	0.0017	0.0031	0.0026
IE	SPRD	240	0.0973	0.1882	0.0014	1.2394	0.0309	0.0446	0.0824	0.0515
	S	240	7.5921	6.394	0.0182	22.6387	1.3196	5.2537	13.2184	11.8989
	TV	240	521086	588660	5162.5	2287281	104707	283785	637250	532543
	ANNVOL	240	0.377	0.2276	0.1051	1.1402	0.2069	0.2827	0.4879	0.281
	TT	240	0.722	0.67	0.1176	3.972	0.2792	0.4573	0.9306	0.6515
	IHP	240	0.0025	0.0042	0	0.0269	0.0005	0.001	0.0021	0.0016
IT	SPRD	1720	0.0336	0.0543	0.0005	1.5005	0.0087	0.019	0.0366	0.0279
	S	1720	6.2804	7.6029	0.0811	54.6233	1.4668	3.5409	7.8687	6.4019
	TV	1720	257022	401843	1345	2351776	20192.5	77979.5	316382	296189
	ANNVOL	1720	0.2596	0.1155	0.0116	1.2415	0.1899	0.2377	0.3	0.1101
	TT	1720	1.146	1.0771	0.1221	5.673	0.3462	0.7146	1.5809	1.2347
	IHP	1720	0.0035	0.0081	0	0.1083	0.0003	0.0008	0.0027	0.0024
LU	SPRD	10	0.0477	0.0199	0.0124	0.0731	0.0353	0.047	0.07	0.0347
	S	10	7.572	0.605	6.3738	8.3931	7.2165	7.7067	8.0422	0.8257
	TV	10	75201.4	39480.6	20293.8	146281	40512.5	65397.4	98619	58106.5
	ANNVOL	10	0.3208	0.0592	0.2407	0.4317	0.2694	0.32	0.3595	0.0901
	TT	10	0.9548	0.3505	0.5788	1.5909	0.6612	0.8232	1.2281	0.5669
	IHP	10	0.0038	0.0022	0.0018	0.0087	0.0023	0.0034	0.005	0.0027
NL	SPRD	440	0.0939	0.0754	0.0019	0.4906	0.0419	0.0768	0.1185	0.0766
	S	440	12.2232	10.2926	0.1047	60.6906	5.3083	9.6924	16.6143	11.306
	TV	440	198357	372254	1672.73	2381457	10359.3	29257.7	162458	152099
	ANNVOL	440	0.3386	0.1795	0.0847	1.1404	0.2004	0.2898	0.4286	0.2282
	TT	440	1.6848	1.3404	0.1266	5.6522	0.4933	1.4407	2.5063	2.0129
	IHP	440	0.009	0.0126	0	0.0978	0.0019	0.0043	0.0115	0.0096
NO	SPRD	30	0.3259	0.2113	0.0362	0.7889	0.0809	0.3814	0.4887	0.4078
	S	30	25.2146	21.5175	2.1991	60.9652	2.9427	21.2924	46.5411	43.5983
	TV	30	188274	216205	5452.17	1125947	74800	113285	232830	158030
	ANNVOL	30	0.5628	0.1894	0.3147	1.033	0.4401	0.4767	0.7079	0.2678
	TT	30	0.8469	0.6817	0.1932	3.131	0.4062	0.617	0.9683	0.5621
	IHP	30	0.0161	0.0132	0.0006	0.0392	0.0012	0.017	0.0281	0.0269

NZ	SPRD	10	0.0169	0.0042	0.0105	0.0242	0.0152	0.0167	0.0189	0.0037
	S	10	2.1706	0.1024	2.0605	2.4116	2.1102	2.156	2.2114	0.1011
	TV	10	1155606	396591	395039	1896471	962174	1159533	1312740	350566
	ANNVOL	10	0.3636	0.0381	0.3037	0.4185	0.3289	0.3582	0.3971	0.0682
	TT	10	0.5787	0.1377	0.4074	0.8917	0.4771	0.5737	0.6183	0.1411
	IHP	10	0.0007	0.0002	0.0005	0.001	0.0006	0.0007	0.0008	0.0002
PL	SPRD	10	0.2151	0.0575	0.1611	0.3579	0.1684	0.2114	0.219	0.0506
	S	10	25.3075	1.1831	23.6	26.8023	24.5214	25.4122	26.4881	1.9667
	TV	10	73563.7	52668.1	20875	207267	42138.9	54029.2	88081.8	45942.9
	ANNVOL	10	0.3555	0.0806	0.2591	0.4794	0.2891	0.3209	0.4279	0.1388
	TT	10	0.9821	0.2679	0.7324	1.6012	0.8468	0.9002	0.9915	0.1447
	IHP	10	0.0136	0.0031	0.01	0.0179	0.0104	0.0136	0.0171	0.0067
PT	SPRD	10	0.097	0.0184	0.0636	0.1209	0.0876	0.1008	0.1086	0.0209
	S	10	13.174	0.5218	12.4198	14.0431	12.8121	13.071	13.6355	0.8233
	TV	10	36548.6	22726	17890.5	89647.1	21463.6	29271.4	37276.2	15812.6
	ANNVOL	10	0.2409	0.0489	0.1527	0.3089	0.2325	0.2421	0.2867	0.0542
	TT	10	1.1637	0.3384	0.6043	1.5617	0.8951	1.1798	1.4915	0.5964
	IHP	10	0.0058	0.0021	0.003	0.0088	0.0042	0.0055	0.0079	0.0037
ZA	SPRD	10	0.5213	0.1409	0.3575	0.7368	0.3825	0.5239	0.6575	0.275
	S	10	15.4606	2.0833	13.3026	19.0761	13.4809	14.6663	17.4637	3.9829
	TV	10	112291	136386	39885	493415	53111.1	64387.9	90088.9	36977.8
	ANNVOL	10	0.5065	0.0827	0.3721	0.629	0.4733	0.5099	0.5732	0.1
	TT	10	1.5131	0.4586	0.9291	2.2933	0.9843	1.5672	1.8662	0.8818
	IHP	10	0.0184	0.0061	0.009	0.0325	0.0156	0.0182	0.0199	0.0043

Table 2.2 – Descriptive Statistics: pre vs post IFRS

$SPRD$ is the bid-ask spread, , TV is the average number of shares traded over a month, $ANNVOL$ is stock volatility, calculated as the standard deviation of stock returns in the 60 trading days prior to the current month, TT is the time between trade in minutes, and IHP is the inventory holding premium

	Variable	n	Mean	StDev	Min	Max	Q1	Median	Q3	Q3-Q1
Pre-IFRS	SPRD	6805	0.1009	0.1503	0.0004	1.6905	0.0187	0.0477	0.1174	0.0986
	S	6805	10.8415	15.5093	0.0106	119.769	1.5405	4.7607	13.4609	11.9204
	TV	6805	254373	421312	1042.86	2381457	12785.7	69780	287905	275120
	ANNVOL	6805	0.4035	0.232	0.0257	1.248	0.2309	0.3362	0.5262	0.2953
	TT	6805	1.7453	1.3635	0.1087	5.6864	0.6366	1.3644	2.4874	1.8508
	IHP	6805	0.0094	0.0159	0	0.1609	0.0009	0.0029	0.0107	0.0099
Post-IFRS	SPRD	6805	0.102	0.1417	0.0004	1.595	0.0205	0.0506	0.1235	0.103
	S	6805	11.7021	16.9515	0.0104	126.083	1.6374	5.1402	14.107	12.4696
	TV	6805	263041	440246	1163.64	2388236	10405.3	62020	301070	290665
	ANNVOL	6805	0.3751	0.208	0.0116	1.2428	0.224	0.3155	0.473	0.249
	TT	6805	1.8459	1.4143	0.1117	5.6888	0.6679	1.4569	2.713	2.0452
	IHP	6805	0.0099	0.0169	0	0.1576	0.001	0.0032	0.0109	0.0099

2.6.2 Regression Results

Table 2.4 reports the results of estimation of Equations 2.12 and 2.13. T-statistics are in parentheses below the parameter estimates, and are based on clustered standard errors, clustered on country and firm. Model (1) is the Equation 2.13 specification, and specifications (2)-(4) are fixed effects models, with fixed effects on country (2), year (3) and both country and year (4). The coefficient on IHP is positive and significant (7.23, t=12.20) as predicted by Bollen et al. (2004), however, the the proxy for order processing costs, $INVTV$ is insignificant and negative. This result is consistent across all specifications. Examination of the result on D, which is the pre-post dummy variable, reveals a positive and significant coefficient estimate, indicating that the spread, in fact *increased* following adoption (0.0033, t=2.21), and is also consistent across all specifications, except (4), where it becomes insignificant. Indeed, such a result goes contrary to seminal research examining the association between disclosure and the bid-ask spread (e.g. Welker (1995)). Recall however, that mean stock price actually increased following the adoption date, hence the reported parameter estimate may simply be capturing this effect, and *not* bear any relationship to adverse selection.

The slope dummy term $INV * D$ isolates the effect of adverse selection in the post-IFRS period relative to the pre adoption period. It is therefore predicted that the coefficient on this term be negative, in the event that the adverse selection component of the spread decreases, following adoption. Table 2.4 specification (1) reports a coefficient of -0.5565 (t=-2.61), implying that a 1% increase in adverse selection results in a decrease in the bid-ask

Table 2.3 – Summary of cross-correlations: pre vs post IFRS

S is the stock price, measured as the midpoint between the bid and ask, TV is the average number of shares traded over a month, $INVTV$ is the inverse of TV, $ANNVOL$ is stock volatility, calculated as the standard deviation of stock returns in the 60 trading days prior to the current month, TT is the time between trade in minutes, and IHP is the inventory holding premium

Variable	S	TV	INVTV	ANNVOL	TT	IHP
Pre-IFRS (n=6805)						
S	1	-0.0467	0.0685	-0.271	-0.0154	0.5755
TV	-0.0467	1	-0.3159	-0.0368	-0.4903	-0.2863
INVTV	0.0685	-0.3159	1	0.0554	0.8075	0.5036
ANNVOL	-0.271	-0.0368	0.0554	1	0.1107	0.0398
TT	-0.0154	-0.4903	0.8075	0.1107	1	0.4813
IHP	0.5755	-0.2863	0.5036	0.0398	0.4813	1
Post-IFRS (n=6805)						
S	1	-0.0576	0.0523	-0.3006	-0.0098	0.6043
TV	-0.0576	1	-0.3412	0.0284	-0.5078	-0.2845
INVTV	0.0523	-0.3412	1	0.0338	0.8382	0.4671
ANNVOL	-0.3006	0.0284	0.0338	1	0.0917	-0.0143
TT	-0.0098	-0.5078	0.8382	0.0917	1	0.4827
IHP	0.6043	-0.2845	0.4671	-0.0143	0.4827	1

Table 2.4 – Results: Adoption pre-post regression

Results of estimating the following regression model:

$$\begin{aligned} SPRD_{it} &= \alpha_0 + \alpha_1 InvTV_i + \alpha_2 IHP_i + \alpha_3 D_t + \alpha_4 InvTV_i D_t \\ &+ \alpha_5 IHP_i D_t + \alpha_6 DISCLOSE_i + \alpha_7 CORRUPT_i + \epsilon_i \end{aligned}$$

$SPRD$ is the bid-ask spread, TV is the average number of shares traded over a month, $INVTV$ is the inverse of TV, D is a dummy variable assuming a value of 1 in the post-IFRS period, and 0 otherwise, and IHP is the inventory holding premium, calculated by:

$$IHP = S[2N(0.5\sigma\sqrt{t}) - 1]$$

$DISCLOSURE$ is a country level disclosure score as per CIFAR (1995), and $CORRUPT$ is a corruption index score as used by La Porta et al. (1998). T-statistics are reported below the coefficient estimates in parentheses, and are corrected for heteroscedasticity and autocorrelation in the residuals.

Variable	(1)	(2)	(3)	(4)
INTERCEPT	0.0906	0.4055	0.0176	0.2912
	(2.25)	(68.06)	(1.74)	(14.75)
INVTV	-43.308	-22.425	-31.864	-18.021
	(-1.81)	(-1.88)	(-1.38)	(-1.80)
IHP	7.2394	6.6948	7.4582	6.5084
	(12.20)	(19.86)	(8.10)	(15.45)
D	0.0033	0.0033	0.0038	0.0026
	(2.21)	(2.41)	(2.16)	(1.77)
INVTV*D	4.4926	1.8500	9.6843	4.8428
	(0.71)	(0.35)	(1.40)	(0.81)
IHP*D	-0.5565	-0.5383	-0.4856	-0.4480
	(-2.61)	(-2.55)	(-2.15)	(-2.11)
DISCLOSURE	-0.0038			
	(-2.80)			
CORRUPT	0.0247			
	(3.15)			
Observations	13510	13610	13610	13610
R^2	0.6830	0.7386	0.6787	0.7525

spread of 0.5565% in the post-IFRS period relative to the pre-IFRS period. Therefore, although the spread is shown to have increased in the post-IFRS period, isolation of its adverse selection component shows that its adverse selection component decreased, as predicted. The same result persists across the various fixed effects models (2)-(4).

The negative coefficient on the $DISCLOSURE$ variable in specification (1) is in accord with prior research on the relation between disclosure and the bid ask spread (Welker, 1995). Hence, a higher pre-IFRS country level disclosure score is associated with a lower bid-ask spread. Finally, the $CORRUPT$ coefficient is positive (0.0247), and significant (t=3.15).

Table 2.5 reports the results of estimation upon inclusion of only early adopters, hence the smaller sample size (n=710). Specifications (1)-(4), are identical to what is presented in Table 2.4, albeit including early adopters only. Interestingly, Table 2.5 (1)-(4) paints a slightly different picture than the full sample regressions. The Bollen et al. (2004) base results are unchanged; positive and significant coefficients on IHP across all four specifications, and insignificant on $INVTV$. Early adopters however, exhibit a statistically significant reduction in their bid-ask spread following adoption (-0.0234, t=-2.14 and -0.0225, t=-2.10; for specifications (1) and (2) respectively). Specifications (3) and (4), the year and country/year fixed effects models, yield insignificant results. The adverse selection component of the spread following adoption, $IHP * D$, is insignificant for early adopters, and while the coefficient on $DISCLOSURE$ is negative and significant, as in Table 2.4, the coefficient on $CORRUPT$ is insignificant.

Table 2.5 – Results: Early adopters relative to matched official adopters

Results of estimating the following regression model:

$$SPRD_{it} = \alpha_0 + \alpha_1 InvTV_i + \alpha_2 IHP_i + \alpha_3 D_t + \alpha_4 InvTV_i D_t + \alpha_5 IHP_i D_t + \alpha_6 DISCLOSE_i + \alpha_7 CORRUPT_i + \epsilon_i$$

$SPRD$ is the bid-ask spread, TV is the average number of shares traded over a month, $INVTV$ is the inverse of TV, D is a dummy variable assuming a value of 1 in the post-IFRS period, and 0 otherwise, and IHP is the inventory holding premium, calculated by:

$$IHP = S[2N(0.5\sigma\sqrt{t}) - 1]$$

$DISCLOSURE$ is a country level disclosure score as per CIFAR (1995), and $CORRUPT$ is a corruption index score as used by La Porta et al. (1998). T-statistics are reported below the coefficient estimates in parentheses, and are corrected for heteroscedasticity and autocorrelation in the residuals.

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
INTERCEPT	0.3998	0.1039	0.0450	0.0585	0.3565	0.1598	0.0395	0.0658
	(1.76)	(8.43)	(1.79)	(1.81)	(1.38)	(12.24)	(1.00)	(1.23)
INVTV	-43.163	-43.268	13.3012	-8.1389	-52.458	-52.816	13.8318	-9.3764
	(-1.49)	(-1.81)	(0.39)	(-0.45)	(-1.66)	(-2.01)	(0.44)	(-0.70)
IHP	5.1725	5.3154	4.7065	4.1686	5.0296	5.1732	4.7212	4.1547
	(6.59)	(8.31)	(8.17)	(7.19)	(5.54)	(6.61)	(7.91)	(6.60)
D	-0.0234	-0.0225	0.0220	0.0037	-0.0240	-0.0231	0.0221	0.0036
	(-2.14)	(-2.10)	(0.89)	(0.15)	(-2.14)	(-2.06)	(0.88)	(0.14)
INVTV*D	-12.821	-8.5654	-30.012	-21.401	-13.883	-9.5759	-29.836	-21.632
	(-0.29)	(-0.20)	(-1.13)	(-1.14)	(-0.31)	(-0.22)	(-1.10)	(-1.10)
IHP*D	0.9185	0.8013	-0.5835	0.1401	0.9691	0.8508	-0.5858	0.1478
	(1.03)	(0.89)	(-1.10)	(0.36)	(1.19)	(1.06)	(-1.11)	(0.34)
DISCLOSURE	-0.0061				-0.0077			
	(-2.15)				(-2.70)			
CORRUPT	0.0124				0.0354			
	(0.29)				(0.76)			
LAMBDA					-0.0640	-0.0653	0.0058	-0.0084
					(-3.85)	(-3.69)	(0.19)	(-0.26)
Observations	710	710	710	710	710	710	710	710
R^2	0.5123	0.5242	0.6566	0.6793	0.5200	0.5322	0.6567	0.6794

The final series of models controls for self-selection bias, a possibility associated with early adopters opting into the IFRS prior to an official requirement to do so at the country level. Estimation of this model is pursuant to a Heckman two-step approach, with the first step being a probit estimation of a dummy variable (early/official adoption) on characteristics of early adopters (Equation 2.20). Table 2.6 reports the result of the probit estimation. Contrary to prior voluntary disclosure literature, the coefficient on $LNSIZE$ is significantly negative (-0.2257, t=-7.27), indicating that larger firms are less inclined to early adopt than smaller firms. This may stem from the notion that smaller firms may wish to increase their visibility through opting into, voluntarily, a higher quality financial reporting regime. For example, Healy et al. (1999) find that firms who increase their level of public disclosure experience an increase in analyst following and institutional ownership, which may be sufficient motivation to opt into the IFRS early.

The coefficient estimate on EPS is positive and significant, indicative of higher performing firms being more willing to early adopt than poorer performers, most likely in order to be distinguishable from the latter, by the market. $ANALYSTS$ is marginally significant (i.e. at the 10% level) and negative, providing additional support to the $LNSIZE$ justification; firms with higher analyst following have a richer information environment, and hence see little benefit in early IFRS adoption. Finally, the coefficients on $DISCLOSURE$ (-0.0285, t=-3.34) and $CORRUPT$ (0.4911, t=10.39) suggest that firms within countries with a documented higher level of information disclosure pre-IFRS, are less likely to early adopt, and those within countries

Table 2.6 – Results: Probit model of determinants of early adoption

Results of estimating the following probit model:

$$\begin{aligned} C_i &= \beta_0 + \beta_1 LNSIZE_{it} + \beta_2 EPS_{it} + \beta_3 FSALES_{it} + \beta_4 LISTINGS_{it} \\ &+ \beta_5 NUMEST_{it} + \beta_6 DISCLOSE_i + \beta_7 CORRUPT_i + \epsilon_{it} \end{aligned}$$

C is a dichotomous variable assuming a value of 1 if the firm is an early adopter, and 0 if the firm adopts at the official country level adoption date, $LNSIZE$ is the log of market capitalisation, EPS is earnings per share scaled by price, $FSALES$ is the level of foreign sales as a percentage of total sales, $ANALYSTS$ is the number of analysts following the firm, $LISTINGS$ is the number of foreign exchange listings, $DISCLOSURE$ is a country level disclosure score as per CIFAR (1995), and $CORRUPT$ is a corruption index score as used by La Porta et al. (1998). T-statistics are reported below the coefficient estimates in parentheses, and are corrected for heteroscedasticity and autocorrelation in the residuals.

Variable	
INTERCEPT	2.3233
	(3.51)
LNSIZE	-0.2160
	(-7.14)
EPS	0.1908
	(3.69)
FSALES	0.0073
	(0.92)
LISTINGS	0.0255
	(0.21)
ANALYSTS	-0.0348
	(-1.93)
DISCLOSURE	0.0016
	(0.12)
Observations	1420
R-Square	0.1019
Max-rescaled	0.1359

with higher perceived corruption are *more* likely to early adopt. In brief, the probit results provide evidence that firms within a lower information environment, have higher performance, and operate within a country with a higher perception of corruption, adopt IFRS early as a signaling mechanism to distinguish themselves from other firms.

Table 2.5 (5)-(8) is once again identical to the prior specifications, but with the addition of $LAMBDA$, to control for self-selection. Like Table 2.5 (1)-(4), specifications (5) and (6) report significant and negative coefficients on D (-0.0239, t=-2.12 and -0.0229, t=-2.03 respectively), which are again insignificant for the year and country/year fixed effects models. For (5) and (6), $LAMBDA$ is significantly negative, revealing self-selection bias, and suggesting that the private information associated with early adoption is in fact associated with a reduction in the bid-ask spread. Upon including fixed effects for year and year/country however, the previously negative and significant result on D becomes insignificant, as does $LAMBDA$, indicating that the time of adoption likely explains the reduction in the spread and self selection bias previously documented.

2.7 Conclusion

The world is currently undergoing quite possibly one of the most significant financial information shifts in history. As the new global standard in financial reporting, the IFRS, many argue, are high quality accounting standards capable of promoting transparency and comparability beyond that achievable by prior domestic standards. Indeed empirical evidence which compares the IFRS to various domestic standards provides strong support for the above contentions.

Following widespread adoption following 2005, and the potential for early adoption prior to that, testing the effect of the IFRS on promoting transparency, and the benefits thereof; is apt at this juncture. This paper addresses one such aspect; adverse selection costs, as operationalised by the *inventory holding premium* (Bollen et al., 2004). Much prior research assumes that adverse selection is subsumed in the bid-ask spread, with prior ad hoc specifications used to test various predictors on the spread. Bollen et al. (2004) demonstrate that such approaches provide an imprecise yardstick in ascertaining any effect on adverse selection cost, and provide a parsimonious model which is theoretically well justified, and based on an intuitive market maker hedging argument.

Results indicate that across the full sample of adopters, the bid-ask spread actually *increased* following adoption, with the inclusion of a slope dummy term yielding a negative and significant coefficient; namely that the adverse selection component of the spread decreased post-adoption, relative to the pre adoption period. Further tests isolating early adopters from the full sample reveal that for this subset, the spread decreased, with no significant difference in adverse selection cost between the pre and post adoption period. The former effect, however, becomes insignificant upon adding a year fixed effect.

Finally, a Heckman (1979) two-step model is estimated in order to test the presence of self-selection bias on the part of early adopters. The first stage probit model which regresses the choice to early adopt or otherwise, on theoretical factors associated with early adoption, indicates that higher performing, smaller firms, with lower analyst following, and domiciled in countries with a traditionally lower disclosure score, are more likely to early adopt. Significant self-selection bias exists among early adopting firms, suggesting that the private information associated with self-selection is associated with a lower bid-ask spread. This result also becomes insignificant upon inclusion of a year fixed effect.

Future research examining adverse selection could conduct further enquiry into the effect of regulatory change, using the Bollen et al. (2004) approach. Extending the IFRS line of enquiry, it may be fruitful to conduct analyses across ADR (American Depository Receipt) firms subject to US GAAP at the time of the switch to the IFRS, which are arguably 'high information environment' firms by comparison. This would provide greater understanding of the benefits of accounting standard in information dissemination in general, and IFRS benefits in particular.

Chapter 3

International Accounting Standards and the Cost of Equity

3.1 Introduction

This paper tests the contention that firms that switch to compliance with the International Financial Reporting Standards (IFRS) from local generally accepted accounting principles (GAAP) experience a reduction in their cost of equity following the change. The recent global trend towards the adoption of the IFRS marks the most significant accounting event in recent history (IFAD, 2002), resulting in a likely shift in the financial information environment. Following widespread official adoption from 2005, this chapter examines the extent to which widely anticipated cost of capital reduction effects (EC, 2002) have been realised, and identifies moderating characteris-

[0]The term official here is analogous to mandatory adoption; the systemic requirement to produce accounting information pursuant to the IFRS. This may be contrasted with voluntary adoption, which occurs in the absence of a mandatory requirement to do so, i.e. prior to official adoption.

tics.

Empirical enquiry into the ability of the IFRS to improve the information environment of adopting firms, has yielded mixed results. Covrig et al. (2006) find evidence that the IFRS succeed in reducing the home bias among foreign investors, particularly for target firms of lower visibility and within poorer information environments. Jennings et al. (2004) adds empirical support to the notion that financial reports prepared under the IFRS are more timely and value relevant. After controlling for self-selection bias relating to voluntary adoption, they find that firms within countries showing similarity between local accounting standards and tax rules are the greatest beneficiaries of IFRS adoption. They argue that the marginal benefit is greater for such firms given the ancillary importance of external reporting to investors within such environments.

Barth et al. (2008) document a decrease in earnings management, more timely loss recognition, and greater value relevance following IFRS adoption compared to a matched sample of non-IFRS adopters. Finally, Ashbaugh and Pincus (2001) find that analyst forecast errors are higher where greater differences exist between domestic standards and the IFRS for non-US firms. Furthermore, they find that the change in the forecast error between the pre and post adoption year are also positive and significantly associated with the change in disclosure and measurement requirements brought about by IFRS adoption. In sum, the above results add empirical support to the contention that the IFRS represent the basis for high quality financial reporting practice.

At odds with such findings, Eccher and Healy (2000) reveal that financial reports prepared pursuant to the international standards fail to provide any statistically significant benefits over the domestic standards within China. They conclude that the distinct environments from which both the PRC and IFRS emanated fail to reveal any differences possibly due to lack of enforcement of the international standards. Presumably, an environment devoid of effective IFRS enforcement potentially allows accounting practices that lean towards local practice. Similarly, Hung and Subramanyam (2007) document that a voluntary switch to international standards within Germany fails to improve the value relevance of income or book value, nor timeliness. They conjecture that institutional factors generally, rather than accounting standards, potentially play a more critical role in a cross country setting.

Evidence suggestive of cost of capital benefits is even more elusive, with either insignificant or weakly significant results dominating the literature. One example is Barth et al. (2008), who use the Fama and French (1993) three-factor model to estimate the cost of capital. Barth et al. (2008) adopt a matched sample approach, matching country, industry, and size, and examine the difference prior and subsequent to adoption. Although not stated specifically within their paper, in the absence of data to the contrary, it is assumed that the pre (post) distinction relates to the voluntary adoption of IFRS at the firm level only. As such, each firm is implicitly matched with an adopting (non-adopting) firm respectively.

This research offers several contributions to the cost of equity literature. Firstly, scant literature exists which examines the association between IFRS adoption and the cost of equity using an implied measure. Criticism continues to surround the usage of realised returns in the estimation of an ex-post cost of equity (e.g. Fama and French, 1997), therefore it is hoped that the present research provides more conclusive results than those of Barth et al. (2008). Secondly, this research illustrates the use of an implied cost of equity metric as the dependent variable in an event study methodology, with the switch to the IFRS from domestic standards being the event under investigation. Specifically, the sample is matched with an equivalent non-adoption sample, controlling for self selection bias arising from firms voluntarily adopting the IFRS prior to an official date of national adoption. Recent transitions to the IFRS provide a rich dataset from which to conduct such an analysis, whilst concurrently disentangling the cost of equity effects prior, and subsequent to official adoption. Results, provide only weak evidence that the IFRS succeed in reducing the cost of equity, with some mixed results across the specified models.

This chapter is structured as follows. The following section details the literature which establishes a linkage between disclosure and the cost of equity. Given the assertions by IFRS proponents that following the IFRS leads to greater transparency in financial reporting, and supportive empirical evidence for some countries (Ashbaugh and Pincus, 2001), an examination of the theoretical linkage between greater disclosure (as an analogue to IFRS adoption), is an appropriate foundation for hypothesis development. Section three details the sample and data, and section four establishes the empirical design. Section five reports on the results, and section six concludes.

3.2 Hypothesis Development

Theoretically, financial information affects the cost of capital through its reduction in nondiversifiable estimation risk (Klein and Bawa, 1976; Barry and Brown, 1985; Coles and Lowenstein, 1988; Handa and Linn, 1973; Coles et al., 1995). A firm's return and payoff distribution must be estimated using both historical and other firm specific data, of which corporate disclosure plays a role. For example, Hribar and Jenkins (2004) find that accounting restatements lead to an increase in the cost of capital following restatement, with the most pronounced effect emerging as a result of auditor initiated restatements. Hence, accounting information is shown to affect the cost of capital in an empirical setting.

Botosan (1997) provides the earliest evidence on the association between the cost of equity and disclosure utilising an implied estimate. Premised on the estimation risk literature, she posits a negative association between the cost of equity and disclosure. Botosan (1997) regresses a cost of equity metric on firm BETA, an ordinal measure of disclosure (DRANK) and market value. Although the coefficient or DRANK is negative as predicted, the result is not significant. BETA and market value of equity are significantly positive and negative respectively. To assess the differential association according to high versus low analyst followed firms, Botosan (1997) estimates the same regression model, albeit with the addition of a dummy variable (DU) denoting a firm less than or equal to the median number of analysts following the sample of firms. The coefficient on DRANK is positive and insignificant. Inclusion of an interaction variable (DRANK*DU) yielded a negative and significant coefficient, indicating that higher disclosure is associated with a lower cost of equity, but only for firms followed by less than the median number of analysts.

Botosan and Plumlee (2002) extend Botosan (1997) by substituting the fractional rank of Annual Reviews of Corporate Reporting Practices (AIMR) disclosure scores with three subsets of corporate disclosure; annual report, quarterly, and investor relations. Their sample consists of 3618 total firm-year observations, spanning the 11-year period 1986-1996. They draw the same conclusion as Botosan (1997), but additionally find that greater frequency in the release of corporate results is actually associated with an increase in the cost of equity. Botosan and Plumlee (2002) suggest a consequent increase in stock volatility due to short-termism associated with greater frequency in the release of information as a justification for this finding.

Gebhardt et al. (2001) raise the importance of industry membership as a determinant of the cost of equity. Furthermore, they find that the book-to-market ratio (B/M) (positively), dispersion in analyst forecasts (negatively), long-term growth (positively) are all significantly related to the implied cost of capital in multivariate tests. Consistent with Fama and French (1992), they conclude a limited role for beta in multi-factor model estimation.

Limited research exists examining the determinants of the cost of equity capital within an international setting. Francis et al. (2005) provide one such example, hypothesising a positive association between a firm's need for external finance and the level of voluntary disclosure, and a negative association between the cost of capital (debt and equity) and voluntary disclosure. They suggest that an optimal level of disclosure exists resulting from a trade-off between the cost of capital benefit of higher voluntary disclosure, and the cost associated with the revelation of proprietary information (Verrecchia, 1983). Additionally, and in this light, they emphasise that the importance of external finance differs across firms, suggesting that levels of voluntary disclosure should be an associated variable. Obtaining their external finance dependency variable data from Rajan and Zingales (1998), they find a positive and significant association with the level of voluntary disclosure across all specifications. Utilising the Easton (2004) PEG model to estimate the ex ante cost of equity, they find that country level factors (a measure of anti-director rights and market structure) are significant and negative as predicted, with the rate of inflation exhibiting a significant and positive coefficient. The size control variable (log of assets) exhibited the only significant coefficient (negative). Fixed effects variants allow similar inferences, although the adjusted R^2 increases substantially.

Given the contemporaneous nature of the introduction of the International Financial Reporting Standards (IFRS), and the limited cost of capital research in the international setting, scant literature exists examining the cost of capital effect of IFRS adoption. One example is Barth et al. (2008), who use the Fama and French (1993) three-factor model to estimate the cost of capital. Barth et al. (2008) adopt a matched sample approach, matching country, industry, and size, and examine the difference prior and subsequent to adoption. Although not stated specifically within their paper, in the absence of data to the contrary, it is assumed that the pre (post) distinction relates to the voluntary adoption of IFRS at the firm level only. As such, each firm is implicitly matched with an adopting (non-adopting) firm respectively.

There are several inherent limitations with Barth et al. (2008) which this research proposes to extend upon. Firstly, the Barth et al. (2008) sample covers the period 1994-2003, isolating adopting firms and matching pre (post) with adopting (non-adopting) firms accordingly. Following 2003, numerous countries reported official IFRS adoption, suggesting that the limited sample reported in Barth et al. (2008) necessitating an ex post cost of capital estimate is no longer an issue. As such, an ex ante (implied) cost of equity measure is adopted within. Secondly, It is likely that systematic differences exist between IFRS adopters prior to an official date of implementation (i.e. voluntary or early adopters), and those which must effectively adopt the IFRS as a mandatory corporate reporting regime. Finally, no account is taken for the extant quality differences between domestic generally accepted accounting principles (GAAP) and the IFRS. It is expected that the cost of equity effect will differ depending on the magnitude of improvement in corporate reporting as a result of the switch. Consistent with the prevailing view that improved disclosure should lead to a decrease in the cost of equity, it is hypothesised that the IFRS, as considered superior to most financial reporting regimes, should achieve this end.

3.3 Measuring the implied cost of equity

Sharpe (1964), Lintner (1965) and Black (1972) forward that expected returns are a linear function of market beta, a notion encapsulated in the Capital Asset Pricing Model (CAPM). Despite early support for the CAPM (Black et al., 1972; Fama and MacBeth, 1973), more recent research questions the central role of beta, rather positing that in the latter 1900's in particular, additional variables exhibit a stronger relation with average returns (Fama and French, 1992). In particular, Fama and French (1992) find a negative relationship between size (market value of equity) and return in univariate tests, and a positive relationship between book-to-market ratio, leverage, and return in Fama and Macbeth regressions. Beta maintains an insignificant association, with stronger support for the aforementioned variables. In concluding, Fama and French (1992) suggest that a multifactor model incorporating the above variables should be included in models intent on estimating the cross section of expected stock returns.

Gebhardt et al. (2001) abandon the notion of estimating the cost of capital based on the CAPM and variants thereof due to the imprecision of results thus far. In particular (p. 136):

> Unfortunately, the cost-of-capital estimates derived from average realised returns have proven disappointing in many regards. For example, after extensive testing of CAPM and three-factor based industry costs-of-capital, Fama and French (1997) conclude that these cost of capital estimates are 'unavoidably imprecise'.

Furthermore, Elton (1999) suggests that the common utilisation of realised returns as a proxy for expected returns is an inappropriate approach.

Specifically, this argument rests on the assumption that information surprises have a tendency to cancel out over the period under investigation. Historically, periods of time may be observed during which stock market realised returns were, on average, lower than the risk-free rate (Elton, 1999), an outcome unanticipated at the outset. Additionally, significant information events alter the expectation of future returns as they arise, resulting in a permanent effect on the realised return.

Gordon and Gordon (1997) suggest that in light of the poor performance of the CAPM, expected return models should be tested using analyst forecast data and backing out the discount rate within a dividend discount model (Equation (3.1)). In this light, cost of equity estimates within the accounting literature predominantly use variants of the dividend discount model in calculating an implied cost of capital. The method effectively involves ascertainment of the internal rate of return (IRR) which equates the present value of future cash flows to current stock price (Gebhardt et al., 2001). The dividend discount model is solved for r utilising analyst forecasts of future dividends. The main difference between the various specifications regards the expected value beyond the forecast horizon, or terminal value.

$$P_0 = \sum_{t=1}^{T} (1+r)^{-t} E_0(dps_t) \tag{3.1}$$

Where:

P_0= stock price at time 0;

r = the cost of equity capital

$E_0(.)$ = the expectations operator;

dps_t = dividends per share

Pastor et al. (2008) provide a recent specification, which is essentially identical in form to Equation (3.1), and which is adopted in this paper:

$$P_t = \sum_{k=1}^{T} \frac{FE_{t+k}(1 - b_{t+k})}{(1 + r_e)^k} + \frac{FE_{t+T+1}}{r_e(1 + r_e)^T} \tag{3.2}$$

Where T = 15.

Mean earnings pre share analyst forecasts for years $t + 1$ and $t + 2$ are obtained, with $t + 3$ estimated as $FE_{t+3} = FE_{t+2} \times LTG$, where LTG is the forecast long term growth estimate. By setting the growth estimate $g_{t+T+1} = LRNGDP$, where $LRNGDP$ is the long run nominal GDP growth rate, and imposing an exponential rate of decline from g_{t+3} to g_{t+T+1}, estimates are made for all intervening years. In particular, g_{t+k} takes on the following functional form:

$$g_{t+k} = g_{t+k-1} \times exp\left[\frac{log(g/g_{t+3})}{(T-1)}\right] \tag{3.3}$$

Using the calculated values for $g_{t+k}(k = 3, ..., 15)$, FE_{t+3} to FE_{t+15} are estimated as:

$$FE_{t+k} = FE_{t+k-1} \times (1 + g_{t+k}) \tag{3.4}$$

With the earnings forecasts now available for t_{t+1} through to t_{t+15}, the next step is to estimate the plowback rates, b, for each year. The plowback rate is calculated as $(1 - NP_t)$, and $NP_t = D_t + REP_t - NE_t$, where NP_t is the payout ratio, D_t is the most recent dividend payout, REP_t is the amount of common stock repurchased during the year, and NE_t is the amount of any common stock issuances during the year. The net payout ratio is calculated by dividing this figure by net income in year t. Given that $g = ROI \times b$ (Brealey and Myers, 2002), and that the return on new investments, given competition, will equal r_e in the steady state, b can be solved for each year by simple rearrangement. Hence:

$$b_{t+k} = b_{t+k-1} - \frac{b_{t+2} - b}{T - 1} \tag{3.5}$$

Where $b = \left(\frac{g}{r_e}\right)$.

As the Pastor et al. (2008) measure is an estimate, a second measure is also adopted for robustness. In identifying such a measure, prior literature comparing exiting measures is consulted. Botosan and Plumlee (2005) assess the relative strength of five widely cited proxies of the implied cost of equity by regressing each measure on a number of firm specific risk factors. All models build on the dividend discount model, solving for r which equates an infinite series of expected future cash flows with current stock price. All models however differ in their assumption regarding the terminal value; the expectation of future cash flows beyond that available from analyst forecast data. The five measures include Botosan and Plumlee (2002), Gebhardt et al. (2001), Gordon and Gordon (1997), Ohlson and Juettner-Nauroth (2005), Gode and Mohanram (2003), and Easton (2004). Results show a significant association between the selected risk proxies and the Botosan and Plumlee (2002) and Easton (2004) measures of the expected return.

Easton and Monahan (2005) evaluate the reliability of seven expected return proxies. Extending previous work such as Guay et al (2003), who conduct regressions of realised return on various expected return proxies, Easton and Monahan (2005) explicitly control for changes in expectations about future cash flows (i.e. earnings surprises). They find that of all proxies tested, none exhibit a positive association with realised returns. Even more striking is the result that the simplest expected return proxy in terms of data requirements, the Easton (2004) PEG model, exhibits no more measurement error than any of the other proxies. As such, the metric in question provides a useful proxy for the implied cost of equity, albeit without the data restrictions likely to emerge for alternate measures. The modified PEG model is as follows:

$$P_{it} = \frac{eps_{it+2} + r \times dps_{it} - eps_{it+1}}{r^2} \tag{3.6}$$

Alternatively, Hribar and Jenkins (2004), in testing the association between accounting restatements and the cost of equity, estimate the implied cost of equity using multiple measures as a robustness check. They adopt Gebhardt et al. (2001), Gode and Mohanram (2003) and Easton and Monahan (2005) as the three cost of capital metrics. Although the metrics are economically different, inferences are invariant to the choice of measure. Consequently, the most appropriate measure, as suggested by Easton and Monahan (2005) is that which imposes fewest data restrictions. The modified

PEG model (Easton, 2004) aptly fits this description.

3.4 Empirical Design

The purpose of this chapter is to test the contention that the IFRS result in a reduction in the cost of equity. This section therefore develops the models used to empirically test the predicted association. Starting with the most intuitive of approaches, Equation 3.7 specifies a univariate association between the cost of equity dependent variable, and a dummy variable assuming a value of 0 prior to IFRS adoption, and 1 thereafter.

The first model is as follows:

$$K_{it} = \beta_0 + \beta_1 D_{it} + \epsilon_{it} \tag{3.7}$$

Where:

$K =$ The ext ante cost of equity

$\alpha_0 =$ The regression intercept, denoting the average ex ante cost of equity in the pre-adoption period

$\alpha_1 =$ The regression slope, denoting the average ex ante cost of equity capital in the post-adoption period

$D_t =$ Dummy variable, zero in the pre-adoption period, and one in the post-adoption period.

$\epsilon =$ The error term

The model depicted in Equation (3.7) however, is far from perfect, as there are likely to be numerous other factors, other than the pre-post dummy variable, which affect the cost of equity. Prior literature for example, almost unanimously includes a measure of size, typically log of market capitalisation, as a factor. Previous research suggests that firm size is correlated with information availability (Gebhardt et al., 2001), with large firms likely to provide a higher level of financial disclosure due to greater public visibility and scrutiny. Furthermore, cross sectional differences in liquidity affect the expectation of returns, and given the evidence that smaller firms are typically less liquid than larger firms, firm size is predicted to be negatively associated with the cost of equity. In a similar light, another proxy for information availability and visibility is the number of analysts following a firm. Brennan and Subrahmanyam (1996) for example, find that greater analyst following is associated with greater liquidity, hence, a multivariate model should also consider analyst coverage as an 'information environment' proxy.

Intuitively, the greater level of financial risk undertaken by the firm by way of debt, the higher the return demanded by equity holders. Therefore, consistent with Modigliani and Miller (1958), the cost of equity is positively associated with the level of leverage. Gebhardt et al. (2001) also emphasise the importance of incorporating a measure of financial leverage in empirical models of the cost of equity. Therefore, market leverage, long-term debt to market value of equity, is also included as an explanatory variable.

Fama and French (1992) show empirically that the ratio of book value to market value of equity (BM) is positively associated with expected returns. If BM is considered to be a proxy for the extent to which a firm is undervalued, then a higher risk premium should result from this mispricing. Additionally, Gebhardt et al. (2001) find that BM is positive and significantly associated with the ext ante cost of equity. Given that the association is both positive and highly significant in both studies, BM is included as a further explanatory variable.

La Porta (1996) and Gebhardt et al. (2001) find that long term growth predictions show a negative association with expected returns. In particular, La Porta (1996) suggests that the long term growth measure, typically proxied by the I/B/E/S *LTG* long term growth forecast, is invariably optimistic, resulting in overpricing. If stocks are mispriced in this way, they will also exhibit a lower cost of equity. However, the feasibility of this association is effectively an empirical question. If, on the other hand, the long term growth estimates are pessimistic, resulting in underpriced stocks; the cost of equity would consequently be higher. Therefore, a specific direction is hard to predict, and is likely influenced by the ability of analysts to predict long term growth with accuracy at any given time. Nevertheless, its association with the cost of equity is clear, and hence is included in the multivariate model.

Finally, several other variables are included as controls. A measure of the level of disclosure as per CIFAR (1995) is included to control for the pre-IFRS adoption level of disclosure, and a measure of corruption as per La Porta et al. (1998) is included to account for the level of investor protection in a given country. It is predicted that these variables be negatively, and positively associated with the cost of equity respectively. Finally, a dummy variable indicating whether a firm is an early adopter or official adopter is also included. This point is elaborated in further tests later. The multivariate model is therefore:

$$
\begin{aligned}
K_{it} &= \alpha_0 + \alpha_1 D_t + \alpha_2 LNSIZE_{it} + \alpha_3 DM_{it} + \alpha_4 BM_{it} + \alpha_5 NUMEST_{it} \\
&\quad + \alpha_6 LTG_{it} + \alpha_7 EARLY_{it} + \alpha_8 DISCLOSURE + \alpha_9 CORRUPT \\
&\quad + \epsilon_t \qquad (3.8)
\end{aligned}
$$

Where:

$K =$ The ex ante cost of equity

$\alpha_0 =$ The regression intercept, denoting the ex ante cost of capital in the pre-adoption period

$\alpha_1 =$ The regression slope, denoting the average ex ante cost of capital in the post-adoption period

$D_{it} =$ Dummy variable, zero in the pre-adoption period, and one in the post-adoption period.

$LNSIZE_{it} =$ Log of market capitalisation for firm i at time t.

$DM_{it} =$ The debt-to-market ratio at time t.

$BM_{it} =$ The book-to-market ratio at time t.

$NUMEST_{it} =$ The number of analyst forecasts at time t.

$LTG_{it} =$ The long term growth estimate at time t.

$EARLY_{it} =$ Dummy variable, one if the firm is an early adopter, and zero otherwise.

$DISCLOSURE =$ The country level disclosure score at 1995 (i.e. pre adoption).

$CORRUPT =$ The country level corruption index score.

Prior research tends to express the dependent variable in terms of a return premium, i.e. in excess of an appropriate risk free rate. Furthermore, there are undoubtedly fluctuations in economic activity across countries and time, which affect the returns demanded by equity holders. In light of this, and to overcome the complexity of gathering such data across countries, fixed effects models incorporating country and time fixed effects are also run as robustness checks of the above models.[1]

Whether there is in fact a difference on the aforementioned associations in the pre vs post IFRS period, is also of interest. In order to isolate such an effect, additional terms interacting each existing predictor (with the exception of $DISCLOSURE$ and $CORRUPT$), with D are included as an additional empirical model. Namely:

$$\begin{aligned} K_{it} &= \alpha_0 + \alpha_1 D_{it} + \alpha_2 LNSIZE_{it} + \alpha_3 DM_{it} + \alpha_4 BM_{it} + \alpha_5 NUMEST_{it} \\ &+ + \alpha_6 LTG_t + \alpha_7 EARLY + \alpha_8 D * DM_t + \alpha_9 D * BM_t \\ &+ \alpha_{10} D * NUMEST_{it} + \alpha_{11} D * LTG_{it} + \alpha_{12} D * EARLY_{it} \\ &+ \alpha_{13} DISCLOSURE + \alpha_{14} CORRUPT + \epsilon_t \end{aligned} \tag{3.9}$$

Where the variables are as defined for Equation 3.8.

[1]These problems are addressed later in this chapter, with each sample firm matched with a control group on country, year, and industry; defining an *abnormal cost of equity*. However such a matching procedure is incredibly restrictive on the sample, hence the raw cost of equity is used at this juncture as a first step.

3.4.1 Self Selection Bias

Prior literature documents systematic differences between firms which voluntarily adopt the IFRS, and those which do not. As such, a problem may arise due to voluntary adopters essentially self-selecting into IFRS reporting. Shehata (1991) identifies the prevalence of self selection bias in extant literature examining the economic consequences of accounting choice. In particular, the decision to adopt a given financial reporting method is not a random process. Rather, managers rationally make decisions according to the perceived comparative advantage of doing so, which, in the case of an accounting choice; is cited as related to firm characteristics.

Originating with Heckman (1979), the notion of self-selection may be viewed as giving rise to an omitted variable problem. Li and Prabhala (2007) illustrate this as follows. Assume that the following regression requires estimation:

$$Y_i = X_i\beta + \epsilon_i \tag{3.10}$$

Assume now, that a sub-sample of firms self selects into choice E. For this sub-sample of firms, the applicable regression equation becomes:

$$Y_i|E = X_i\beta + \epsilon_i|E \tag{3.11}$$

As the self-selected sub sample is not random, failure to account for self-selection results in inconsistent β estimators. In correcting for self selection bias, the first step requires identification of factors likely to explain the decision to self-select. I.e:

$$E \equiv W_i = Z_i\gamma + \eta_i > 0 \tag{3.12}$$

Where W_i is the selection variable, typically a dichotomous variable denoted as 1 for selection, and 0 otherwise. Z_i is a vector of public exogenous variables, γ is a vector of coefficients, and η_i is an error term orthogonal to γ. It therefore implies that the equivalent expression for non-selection, NE, is as follows:

$$NE \equiv W_i = Z_i\gamma + \eta_i \leq 0 \tag{3.13}$$

Therefore, to estimate Equation 3.10 in the presence of self selection, and taking its expectation, and substituting in 3.12, the expression becomes:

$$\begin{aligned} Y_i|E &= X_i\beta + (\epsilon_i|Z_i\gamma + \eta_i > 0) \\ &= X_i\beta + \pi(\epsilon_i|Z_i\gamma + \eta_i > 0) + v_i \end{aligned} \tag{3.14}$$

The expression in 3.14 follows from the notion that $\epsilon_i|\eta_i = \pi\eta_i + v_i$, a regression of ϵ_i on η_i, where π is therefore the coefficient, and v_i is the orthogonal error term. An equivalent expression for firms which do not self select into the choice under investigation may similarly be derived, by substituting Equation 3.13 into Equation 3.10. Taking expectations, and denoting the second term in Equation 3.14 as $\lambda_C(Z_i\gamma)$, Li and Prabhala (2007) present the following expression, which captures the essence of Heckman (1979):

$$E(Y_i|C) = X_i\beta + \pi\lambda_C(Z_i\gamma) \tag{3.15}$$

Where π is the coefficient on the *inverse mills ratio*, and C denotes the choice to self select, or otherwise, by the firm. Examination of 3.15 clearly reveals the omitted variable problem. Estimation of 3.10 omits the final term in Equation 3.15, which arises due to a subset of firms self selecting into a given choice. Voluntary adoption into a particular disclosure regime, or in this case, early adoption, provides a classic example of the self selection problem. Therefore, a 2-step Heckman estimation to account for potential self selection bias requires, in addition to a vector of explanatory variables X_i, but also a vector Z_i of public variables which, according to theory, are expected to predict the self selection decision. The following section elaborates the choice of Z_i as applicable to this paper; firm specific variables associated with early IFRS adoption.

Early adoption: Probit model to account for self-selection

Disclosure literature in accounting suggests systematic characteristics of firms which opt into a higher quality financial reporting regime, or voluntarily provide financial disclosure above a minimum requirement. For example, Healy et al. (1999) finds that firms which have higher visibility are more inclined to provide voluntary disclosure, with large firms being more transparent (Ahmed and Courtis, 1999; Lang and Lundholm, 1993), as are cross listed firms (Lang et al., 2003).

In terms of adoption of international accounting standards in particular, Dumontier and Raffournier (1998), drawing a sample of Swiss firms, find that global dependence, proxied by both the proportion of total sales outside Switzerland in addition to sales outside Europe, and size; are both significantly greater for IAS[2] compared to non-IAS firms. Ashbaugh (2001) lends further insight into the characteristics of firms which voluntarily report pursuant to either the international accounting standards (IAS) or United States (US) Generally Accepted Accounting Principles (GAAP). She hypothesises that voluntarily adoption of either IAS or US GAAP is a function of 1) the number of foreign listings, 2) the number or stock issuances, and 3) the domestic financial reporting requirements of the firm. Ashbaugh (2001) finds positive and significant coefficients on the choice of IFRS/US GAAP standards and US listing (at the 0.01 level), the number of markets listed, and firm size (both at the 0.05 level).

Cuijpers and Buijink (2005) conduct a similar analysis to Ashbaugh (2001), albeit limiting their sample to European Union (EU) domiciled firms, and examining the effect of regime choice on 1) the cost of equity, 2) analyst following, and 3) stock return volatility. They argue that net benefits of non-local GAAP adoption accrue primarily to firms reliant on the international capital market. Firms which are cross-listed on two or more stock markets increase the level of disclosure, both on a voluntary and mandatory basis. As such, and consistent with Ashbaugh and Pincus (2001), they hypothesise that the benefits of non-local GAAP adoption increases with the number of

[2]the International Accounting Standards (IAS) are the early standards developed by the then International Accounting Standards Committee. Standards developed by the IASB are termed the IFRS

foreign listings.

Irrespective of the level of cross-listing activity, consistent with the findings of Dumontier and Raffournier (1998), El-Gazzar et al. (1999) and Murphy (1999), Cuijpers and Buijink (2005) find that a greater degree of foreign operations leads to high non-local GAAP adoption. In brief, Cuijpers and Buijink (2005) reveal that a greater number of foreign listings, poor quality domestic GAAP, permission to adopt IFRS, and firm size are significantly related to the decision to adopt non-local GAAP. Upon also considering the theoretical notion that better performing firms are likely more likely to voluntarily disclose (Verrecchia, 1983), and hence early adopt the IFRS, the following first-stage probit model is specified:

$$\begin{aligned} C_i &= \beta_0 + \beta_1 LNSIZE_{it} + \beta_2 EPS_{it} + \beta_3 FSALES_{it} + \beta_4 LISTINGS_{it} \\ &\quad + \beta_5 NUMEST_{it} + \beta_6 DISCLOSE_i + \beta_7 CORRUPT_i + \epsilon_{it} \qquad (3.16) \end{aligned}$$

Where:

$C_i =$ A dichotomous variable assuming a value of 1 if the firm is a voluntary adopter, or 0 otherwise.

$LNSIZE_{it} =$ The natural log of size for i at time t

$EPS_{it} =$ Earnings per share scaled by stock price for firm i at time t

$FSALES_{it} =$ Foreign sales as a proportion of total sales for firm i at time t

$LISTINGS_{it} =$ The number of foreign listings for firm i at time t

$NUMEST_{it} =$ The number of analysts following firm i at time t

$DISCLOSE_i =$ Local GAAP based disclosure/transparency score for firm i

$CORRUPT =$ a corruption index score, as per La Porta et al. (1998).

Time t denotes the time of the switch to the IFRS, or more specifically, the most recent data prior to adoption.

With a first stage model and hence means of ascertaining Heckman's Lambda at hand, a second stage model correcting for self selection may be specified. At this point, it is prudent to consider the shortcomings of merely utilising a raw cost of equity measure as the dependent variable. In particular, country specific and time variant factors such as the risk-free rate and the level of economic activity, may influence a given data point. As a rectification the following model defines an *abnormal cost of equity* for each early adopter, for each of the two cost of equity metrics. The method is simply the cost of equity of each sample early adopter, less the mean cost of equity of a comparison group of similar non adopters. The matching criteria being firstly on country, year, then consistent with Lyon and Barber (1997), 4-digit industry code, and size within the range of 70-130% (sample permitting). Given the abnormal cost of equity now as the dependent variable, coupled with the inclusion of Heckman's Lambda, the following regression model is specified:

$$\begin{aligned} AbK_{it} = {} & \alpha_0 + \alpha_1 D_{it} + \alpha_2 LNSIZE_{it} + \alpha_3 DM_{it} + \alpha_4 BM_{it} + \alpha_5 NUMEST_{it} \\ & + \alpha_6 LTG_{it} + \alpha_7 EARLY_i + \alpha_8 DISCLOSURE + \alpha_9 CORRUPT \\ & + \alpha_{10} LAMBDA_{it} + \epsilon_t \end{aligned} \tag{3.17}$$

Where:

$AbK =$	The ex ante abnormal cost of equity, i.e. $K_{it} - K_{CTRL}$
$D_t =$	Dummy variable, zero in the pre-adoption period, and one in the post-adoption period.
$DM_t =$	The debt-to-market ratio at time t.
$BM_t =$	The book-to-market ratio at time t.
$NUMEST_t =$	The number of analyst forecasts at time t.
$LTG_t =$	The long term growth estimate at time t.

$EARLY =$	Dummy variable, one if the firm is an early adopter, and zero otherwise.
$DISCLOSURE =$	The country level disclosure score at 1995 (i.e. pre adoption).
$CORRUPT =$	The country level corruption index score.
$LAMBDA =$	Heckman's Lambda.
$\epsilon =$	The error term

3.5 Data

As the primary item of interest, the switch date to IFRS is firstly ascertained for as many global firms as possible. The window of inclusion is 1998-2008, chosen as it closely corresponds with improvements made to the standards to conform with revisions to the standards necessary to gain International Organisation of Securities Commission (IOSCO) endorsement (Epstein and Mirza, 2004). Data for identification of this event is obtained from Worldscope, which details the accounting standards adopted, as reported in financial reports, on an annual basis. From the universe of Worldscope firms, and subsequent to the exclusion of all firms within countries with no IFRS adoption and firms with missing data, the preliminary sample size is 18762 firms.

The IFRS switch year is the first identified year where financial reports are noted as having been prepared according to the IFRS. For this, annual data on the standards adopted by each sample firm are obtained from Worldscope, with a 'switch' being identified when t=IFRS and t-1=domestic standards.

The Worldscope data also note 'hybrid' adoption by some firms, for example, in the case where the IFRS are partially complied with alongside the extant domestic standards. For the purpose of this exercise, all such firms were excluded to avoid contamination of the sample. A switch year is identified for 5856 firms, 571 of which are identified as early adopters.[3]

Data necessary to calculate the two cost of capital measures, Easton (2004) and Pastor et al. (2008), henceforth denoted R_{MPEG} and R_{PSS} respectively are obtained from a number of sources. All analyst forecast estimates are obtained from I/B/E/S, covering the entire window of inclusion. To calculate R_{MPEG}, one and two-year consensus forecasts from I/B/E/S are used, and dividend data is from Compustat Global.

To calculate R_{PSS} one and two-year ahead forecasts from I/B/E/S are also used, in addition to the consensus long term growth estimate provided by I/B/E/S. In order to forecast beyond $t+3$, an assumption is made that the steady state growth rate in year $t+T+2$ is equal the rolling average of the annual nominal GDP growth rate within the market of domicile. The value for each year is based on a rolling average of all prior years figures, given data availability, with data for most countries available starting from 1961. These figures are nominalised by adding to the rolling average GDP growth rate, the rolling average of the annual inflation GDP deflator, also obtained from the World Bank.

The data required for DM and BM obtained Compustat Global, and

[3]The IASPLUS website (http://www.iasplus.com) provided the primary source of official adoption dates by country, enabling delineation of early from 'official' adopters.

market capitalisation for $LNSIZE$ is obtained from Worldscope. Additionally, $NUMEST$ and LTG, are obtained from I/B/E/S, $DISCLOSURE$, is obtained from CIFAR (1995) and $CORRUPT$, is obtained from La Porta et al. (1998). Finally, the remaining data required for estimating the probit specification are obtained from Worldscope.

In order to examine the IFRS effect in a pre vs post framework, data is required for the 10 months pre and 10 months post the IFRS adoption month. The choice of 10 months is to capture the effect over a year pre vs post, after discarding the month of the first IFRS earnings announcement (t=0), and also t=-1, where t is used here to denote firm-month observations. Given the sample of adopters (n=5856), the requirement of 20 observations results in 117,120 firm-month observations. Firstly, to reduce the effect of outliers in the cost of equity estimates, the top and bottom 2.5% of observations were removed based on each of the two measures. To maintain balance in pre and post observations, any firm which did not yield exactly 10 pre and 10 post observations is removed from the sample. Furthermore, to enable comparison between the two cost of equity measures, only the subset of firms which have observations for R_{MPEG} and R_{PSS} are included in the sample. After accounting for missing observations on the remaining variables, the final sample is 2700, comprising 1350 pre-IFRS and 1350 post-IFRS observations.

3.6 Results

The effect of IFRS adoption on the cost of equity is examined as follows. Firstly, descriptive statistics by country and pre vs post IFRS adoption are presented respectively. Next, estimation of Equations (3.7), (3.8), and (3.9), followed by equivalent fixed effects models, are detailed. In these models, of particular interest is the dummy variable D, which essentially isolates the effect of IFRS adoption via the pre vs post delineation. Finally, to control for the potential for self selection bias, a two-stage Heckman model is estimated, drawing upon the probit specification in Equation (3.16).

3.6.1 Descriptive Statistics

Table 3.1 reports descriptive statistics for the variables drawn upon for the regression models, reported by country. With the exception of a few notable cases, most strikingly Australia and South Africa, the estimate of R_{PSS}, henceforth denoted as simply R, is consistently lower than R_{MPEG}, henceforth denoted as $MPEG$, across the sample. This observation is in line with prior research comparing cost of equity metrics. Descriptive statistics in the pre-IFRS vs the post-IFRS period (Table ?? show a marginal decrease in both cost of equity measures in the post-period. Additionally, the number of analysts following the sample of firms increased, on average, from about 11 to over 12.

Table 3.1 – Descriptive Statistics by Country

R is the ex ante cost of equity based on Pastor et al. (2008), $MPEG$ is the ex ante cost of equity calculated based on Easton (2004), $LNSIZE$ is the log of market capitalisation, DM is the debt to market ratio and BM is the book to market ratio. $NUMEST$ is the number of analysts following a given firm, LTG is the long term growth rate provided by I/B/E/S, and $EARLY$ is a dummy variable assuming a value of 1 if a firm is an early adopter, and 0 otherwise. $DISCLOSURE$ is a country level disclosure score as per CIFAR (1995), and $CORRUPT$ is a corruption index score as used by La Porta et al. (1998).

Country	Variable	n	Mean	StDev	Min	Max	Q1	Median	Q3	Q3-Q1
AU	R	460	0.1371	0.1309	0.0347	0.7205	0.076	0.0917	0.1177	0.0418
	MPEG	460	0.1188	0.025	0.0643	0.2299	0.1016	0.1152	0.1306	0.029
	LNSIZE	460	13.158	1.4707	9.6311	15.9111	12.312	13.51	14.0307	1.7187
	SIZE	460	1219088	1700645	15231	8130140	222341	737781	1240056	1017715
	DM	460	0.1513	0.1295	0	0.5648	0.0432	0.1501	0.2045	0.1614
	BM	460	0.3735	0.1393	0.0718	0.7063	0.2953	0.3675	0.439	0.1437
	NUMEST	460	4.4696	2.648	1	12	2	4	6	4
	LTG	460	0.1255	0.0656	0.0258	0.4032	0.0782	0.1097	0.164	0.0858
BE	R	60	0.1178	0.1283	0.0383	0.5203	0.0671	0.073	0.0966	0.0295
	MPEG	60	0.1235	0.0366	0.0772	0.1919	0.0881	0.1185	0.1538	0.0657
	LNSIZE	60	13.5489	1.1811	11.8911	14.4831	11.8916	14.337	14.3482	2.4565
	SIZE	60	1219189	770541	145957	1949600	146042	1684600	1703500	1557458
	DM	60	0.1354	0.1184	0.0082	0.4246	0.0095	0.117	0.1965	0.1871
	BM	60	0.5701	0.0882	0.4353	0.7519	0.5431	0.544	0.6239	0.0808
	NUMEST	60	9.3333	6.169	3	21	5	6	16.5	11.5
	LTG	60	0.1566	0.1839	0.0131	0.7223	0.0749	0.1039	0.1348	0.06
CH	R	100	0.076	0.0152	0.0366	0.1148	0.0648	0.0748	0.0864	0.0216
	MPEG	100	0.1178	0.0317	0.071	0.2068	0.0926	0.1122	0.1333	0.0407
	LNSIZE	100	13.526	1.5097	11.1075	15.2372	12.1911	14.4757	14.6096	2.4185
	SIZE	100	1596612	1345370	66668	4144000	197035	1935221	2212417	2015382
	DM	100	0.1257	0.051	0.052	0.2207	0.0806	0.1216	0.1894	0.1087
	BM	100	0.2693	0.0675	0.1693	0.3999	0.2281	0.2592	0.3341	0.1061
	NUMEST	100	6.59	2.8073	1	11	5	7	9	4
	LTG	100	0.1185	0.036	0.054	0.2229	0.1006	0.1094	0.1345	0.0339
DE	R	140	0.0675	0.011	0.0469	0.0975	0.0588	0.0654	0.0774	0.0186
	MPEG	140	0.0952	0.014	0.0652	0.1205	0.0842	0.0963	0.1061	0.0218

	LNSIZE	140	14.4682	1.1585	12.9181	16.1874	13.1441	14.3041	15.5487	2.4045
	SIZE	140	3584259	3861513	407642	10720000	510992	1631650	5658407	5147415
	DM	140	0.1532	0.1417	0.0032	0.4566	0.051	0.1099	0.1872	0.1362
	BM	140	0.5722	0.2299	0.2955	1.0664	0.4054	0.5145	0.8479	0.4424
	NUMEST	140	17.6643	8.098	4	35	12	16	23.5	11.5
	LTG	140	0.0779	0.0327	0.0164	0.1405	0.0533	0.0766	0.0948	0.0415
DK	R	60	0.0668	0.0056	0.0551	0.0808	0.0633	0.0665	0.0705	0.0073
	MPEG	60	0.0951	0.0147	0.0665	0.1205	0.0833	0.0983	0.1056	0.0224
	LNSIZE	60	16.9739	1.0335	15.5277	17.9322	15.5656	17.4742	17.8695	2.304
	SIZE	60	34670000	22430000	5541000	61350000	5755000	38870000	57630000	51870000
	DM	60	0.035	0.0212	0.0048	0.0538	0.0058	0.0477	0.0499	0.0441
	BM	60	0.0802	0.0297	0.0466	0.1303	0.0541	0.0716	0.107	0.0529
	NUMEST	60	17.0167	7.2731	6	29	9	17.5	24.5	15.5
	LTG	60	0.1058	0.0336	0.04	0.1452	0.0855	0.1104	0.1399	0.0545
ES	R	80	0.1026	0.0389	0.063	0.3037	0.0792	0.0916	0.1072	0.028
	MPEG	80	0.0939	0.0101	0.0711	0.1129	0.0861	0.0943	0.1019	0.0158
	LNSIZE	80	15.2739	0.9876	13.8007	16.8667	14.4325	15.4567	15.8726	1.4401
	SIZE	80	6648994	6243882	985315	21140000	2132012	5161403	8239316	6107304
	DM	80	0.2693	0.2108	0.0109	0.6301	0.0679	0.2567	0.4322	0.3643
	BM	80	0.3926	0.2275	0.0991	0.7923	0.2086	0.3689	0.5474	0.3388
	NUMEST	80	14.825	7.0671	5	30	9	13	19	10
	LTG	80	0.1244	0.0485	0.0518	0.2359	0.085	0.1142	0.17	0.085
FI	R	100	0.0832	0.0162	0.0489	0.143	0.0748	0.0811	0.0908	0.016
	MPEG	100	0.1384	0.0365	0.0648	0.2243	0.1094	0.1322	0.1591	0.0497
	LNSIZE	100	14.3991	1.1845	13.0452	16.5616	13.5741	14.0433	14.6261	1.0521
	SIZE	100	4044403	5729015	462869	15580000	785500	1256600	2249300	1463800
	DM	100	0.2608	0.091	0.1614	0.3845	0.1706	0.2275	0.3743	0.2037
	BM	100	0.5881	0.1231	0.413	0.8445	0.4775	0.5859	0.6526	0.1751
	NUMEST	100	16.08	6.819	4	30	10.5	15	20	9.5
	LTG	100	0.0501	0.0206	0.025	0.1235	0.04	0.0423	0.05	0.01
FR	R	280	0.0911	0.0461	0.0484	0.5612	0.0664	0.0832	0.094	0.0276
	MPEG	280	0.1076	0.0252	0.0668	0.2077	0.0902	0.1067	0.1184	0.0281
	LNSIZE	280	15.806	1.7323	11.4641	18.0433	14.2676	16.4652	17.1152	2.8476
	SIZE	280	18870000	19710000	95238	68570000	1572424	14220000	27110000	25540000
	DM	280	0.2041	0.125	0	0.4831	0.1251	0.2277	0.2948	0.1697
	BM	280	0.4889	0.2032	0.2145	0.9638	0.3465	0.455	0.5461	0.1996

	NUMEST	280	16.7107	6.4828	2	32	13	17	21	8
	LTG	280	0.0902	0.0522	0.02	0.4225	0.06	0.0867	0.11	0.05
GB	R	860	0.087	0.0275	0.0337	0.5849	0.0758	0.0837	0.0927	0.0169
	MPEG	860	0.1057	0.0194	0.0611	0.2028	0.0934	0.1034	0.1155	0.0221
	LNSIZE	860	14.3342	1.5221	11.5384	17.0796	13.2975	14.085	15.7975	2.5
	SIZE	860	4690313	6464828	102581	26160000	595700	1310284	7257000	6661300
	DM	860	0.3629	0.2717	0	1.2128	0.1862	0.3388	0.4921	0.3058
	BM	860	0.7558	0.3267	0.1133	1.7957	0.5404	0.7228	0.9875	0.4471
	NUMEST	860	11.9756	6.9516	1	44	7	11	15	8
	LTG	860	0.0889	0.036	0.0105	0.2304	0.065	0.08	0.1079	0.0429
IE	R	20	0.1018	0.006	0.0921	0.1125	0.0969	0.1028	0.1062	0.0093
	MPEG	20	0.094	0.0049	0.082	0.1012	0.091	0.0935	0.0982	0.0072
	LNSIZE	20	16.6299	0.0697	16.5619	16.6978	16.5619	16.6299	16.6978	0.1359
	SIZE	20	16720000	1164337	15590000	17860000	15590000	16720000	17860000	2269710
	DM	20	0.3686	0.025	0.3442	0.393	0.3442	0.3686	0.393	0.0487
	BM	20	0.4968	0.0262	0.4713	0.5223	0.4713	0.4968	0.5223	0.051
	NUMEST	20	14.3	2.1051	9	18	14	15	15	1
	LTG	20	0.0947	0.0261	0.05	0.12	0.0806	0.1	0.1167	0.0361
IT	R	20	0.1383	0.0132	0.1114	0.1688	0.1308	0.1354	0.1451	0.0142
	MPEG	20	0.1066	0.0115	0.0791	0.1249	0.1016	0.1083	0.1123	0.0107
	LNSIZE	20	15.4949	0.0083	15.4868	15.503	15.4868	15.4949	15.503	0.0162
	SIZE	20	5362372	44431	5319066	5405678	5319066	5362372	5405678	86612
	DM	20	0.2989	0.0162	0.2831	0.3147	0.2831	0.2989	0.3147	0.0317
	BM	20	0.4616	0.055	0.4079	0.5152	0.4079	0.4616	0.5152	0.1073
	NUMEST	20	11.15	1.8715	9	15	9	11	13	4
	LTG	20	0.0761	0.026	0.0508	0.1409	0.057	0.0677	0.0909	0.0339
NL	R	160	0.1042	0.0479	0.0398	0.4506	0.0755	0.0937	0.1221	0.0466
	MPEG	160	0.1289	0.0235	0.0811	0.2072	0.1144	0.1235	0.1385	0.0241
	LNSIZE	160	15.009	0.9646	13.5212	16.8767	14.376	14.7814	15.6471	1.271
	SIZE	160	5419394	6191977	745068	21350000	1762826	2629211	6245314	4482488
	DM	160	0.2411	0.127	0.0034	0.5498	0.1669	0.2521	0.2857	0.1188
	BM	160	0.3488	0.1095	0.1392	0.4829	0.2778	0.3448	0.4598	0.1821
	NUMEST	160	15.2688	7.4856	5	34	9	12	20	11
	LTG	160	0.1497	0.0863	0.03	0.4003	0.0794	0.1365	0.1967	0.1173
NO	R	20	0.124	0.0966	0.0507	0.4179	0.056	0.0598	0.1791	0.1231

	MPEG	20	0.2242	0.0251	0.1659	0.2597	0.211	0.2224	0.2428	0.0318
	LNSIZE	20	17.6918	0.0711	17.6225	17.7611	17.6225	17.6918	17.7611	0.1387
	SIZE	20	48360000	3434468	45010000	51710000	45010000	48360000	51710000	6695010
	DM	20	0.0516	0.0013	0.0504	0.0528	0.0504	0.0516	0.0528	0.0025
	BM	20	0.0641	0.001	0.0631	0.065	0.0631	0.0641	0.065	0.0019
	NUMEST	20	14.7	4.9852	5	21	11	16	19	8
	LTG	20	0.0279	0.003	0.025	0.035	0.025	0.0288	0.03	0.005
NZ	R	40	0.1176	0.0188	0.0968	0.1708	0.1057	0.1105	0.1249	0.0192
	MPEG	40	0.1306	0.0354	0.0814	0.1882	0.0981	0.1206	0.1689	0.0708
	LNSIZE	40	14.0475	0.2823	13.725	14.3456	13.771	14.0596	14.3239	0.5529
	SIZE	40	1310285	359603	913499	1699165	957492	1314238	1663078	705586
	DM	40	0.3441	0.1274	0.2128	0.483	0.2187	0.3403	0.4694	0.2507
	BM	40	0.1825	0.0476	0.1115	0.241	0.1439	0.1888	0.2211	0.0772
	NUMEST	40	5.85	1.7328	4	9	4	5.5	7	3
	LTG	40	0.109	0.0587	0.03	0.1928	0.0581	0.0837	0.1693	0.1112
PH	R	20	0.1266	0.0097	0.1095	0.1427	0.1202	0.1247	0.1352	0.015
	MPEG	20	0.1212	0.0146	0.0768	0.1394	0.1165	0.125	0.1294	0.0129
	LNSIZE	20	18.6346	0.0007	18.634	18.6353	18.634	18.6346	18.6353	0.0013
	SIZE	20	123900000	82283.5	123800000	123900000	123800000	123900000	123900000	160400
	DM	20	0.0058	0.0005	0.0054	0.0063	0.0054	0.0058	0.0063	0.0009
	BM	20	0.0084	0.0008	0.0077	0.0092	0.0077	0.0084	0.0092	0.0015
	NUMEST	20	10.65	0.6708	10	12	10	11	11	1
	LTG	20	0.1219	0.0387	0.0755	0.1692	0.0858	0.1179	0.1692	0.0834
SE	R	200	0.1099	0.1297	0.0457	0.8555	0.0716	0.0799	0.0916	0.02
	MPEG	200	0.1068	0.0191	0.0628	0.1481	0.0947	0.1034	0.1234	0.0288
	LNSIZE	200	17.3884	1.0029	15.473	19.1207	16.6354	17.3433	17.9316	1.2962
	SIZE	200	57070000	57890000	5246000	201400000	16820000	34050000	61400000	44580000
	DM	200	0.0182	0.0107	0	0.0437	0.0108	0.0169	0.0224	0.0116
	BM	200	0.0629	0.0214	0.0418	0.1241	0.0507	0.0572	0.0664	0.0158
	NUMEST	200	18.635	8.2573	5	41	13	17	24.5	11.5
	LTG	200	0.0635	0.0312	0.0162	0.193	0.0417	0.0533	0.075	0.0333
ZA	R	80	0.2103	0.142	0.0797	0.5555	0.122	0.1683	0.2106	0.0886
	MPEG	80	0.1526	0.0368	0.0985	0.2441	0.1199	0.145	0.1744	0.0545
	LNSIZE	80	16.3106	0.4334	15.9262	17.2711	15.9755	16.1239	16.5395	0.564
	SIZE	80	13510000	7439023	8253800	31680000	8679200	10060000	15290000	6609630
	DM	80	0.0135	0.005	0.0055	0.0214	0.0093	0.0137	0.0173	0.0081

BM	80	0.0643	0.0225	0.0301	0.0908	0.043	0.0691	0.0846	0.0415
NUMEST	80	6.525	2.7512	1	13	5	6	9	4
LTG	80	0.2551	0.1275	0.1	0.5	0.17	0.2	0.34	0.17

Table 3.2 – Descriptive Statistics: pre vs post IFRS

R is the ex ante cost of equity based on Pastor et al. (2008), *MPEG* is the ex ante cost of equity calculated based on Easton (2004), *LNSIZE* is the log of market capitalisation, *DM* is the debt to market ratio and *BM* is the book to market ratio. *NUMEST* is the number of analysts following a given firm, *LTG* is the long term growth rate provided by I/B/E/S, and *EARLY* is a dummy variable assuming a value of 1 if a firm is an early adopter, and 0 otherwise. *DISCLOSURE* is a country level disclosure score as per CIFAR (1995), and *CORRUPT* is a corruption index score as used by La Porta et al. (1998).

	Variable	n	Mean	StDev	Min	Max	Q1	Median	Q3	Q3-Q1
Pre-IFRS	R	1350	0.1105	0.0936	0.0383	0.8555	0.0746	0.0872	0.1066	0.032
	MPEG	1350	0.1141	0.0277	0.0611	0.2597	0.0973	0.1091	0.1258	0.0284
	LNSIZE	1350	14.6928	1.8704	9.6311	19.0706	13.4565	14.4757	16.1625	2.7059
	SIZE	1350	11170000	25050000	15231	191500000	698400	1935221	10450000	9755400
	DM	1350	0.2107	0.2017	0	1.0399	0.0432	0.176	0.3203	0.2772
	BM	1350	0.4498	0.2975	0.0077	1.6207	0.2458	0.4079	0.6348	0.389
	NUMEST	1350	11.3022	7.4797	1	44	6	10	15	9
	LTG	1350	0.1065	0.0805	0.0105	0.7223	0.06	0.0858	0.1248	0.0648
Post-IFRS	R	1350	0.0955	0.0665	0.0337	0.7205	0.0709	0.082	0.0955	0.0246
	MPEG	1350	0.1122	0.0289	0.0628	0.2299	0.0928	0.1062	0.1241	0.0313
	LNSIZE	1350	14.7827	1.8494	9.7561	19.1207	13.4942	14.5965	16.2	2.7058
	SIZE	1350	11740000	25690000	17260	201400000	725166	2183600	10850000	10130000
	DM	1350	0.2354	0.2279	0	1.2128	0.0422	0.1879	0.3454	0.3032
	BM	1350	0.5105	0.3415	0.0092	1.7957	0.2701	0.4709	0.6992	0.4291
	NUMEST	1350	12.7593	7.9783	1	41	6	11	18	12
	LTG	1350	0.1014	0.0559	0.0131	0.5	0.064	0.09	0.1268	0.0628

Table 3.3 presents cross-correlations between the cost of equity measures, and the dependent variables used in the analysis. Notably, the two cost of equity measures are positively correlated ($\rho = 0.242$ in the pre-IFRS period, and $\rho = 0.2717$ in the post period), which is not unexpected given that they are merely alternate means of ex ante cost of equity estimation. Secondly, size is negatively associated with both R and $MPEG$, and interestingly, this association has a greater negative magnitude in the post-IFRS period. Contrary to intuition and prior evidence, both DM and BM exhibit a negative correlation with both R and $MPEG$. Finally, $NUMEST$, which is analyst following, is negatively, and LTG, being the estimate of long term growth, is positively associated with the cost of equity.

Table 3.3 – Summary of cross-correlations: pre vs post IFRS

R is the ex ante cost of equity based on Pastor et al. (2008), $MPEG$ is the ex ante cost of equity calculated based on Easton (2004), $LNSIZE$ is the log of market capitalisation, DM is the debt to market ratio and BM is the book to market ratio. $NUMEST$ is the number of analysts following a given firm, LTG is the long term growth rate provided by I/B/E/S, and $EARLY$ is a dummy variable assuming a value of 1 if a firm is an early adopter, and 0 otherwise. $DISCLOSURE$ is a country level disclosure score as per CIFAR (1995), and $CORRUPT$ is a corruption index score as used by La Porta et al. (1998).

Variable	R	MPEG	LNSIZE	DM	BM	NUMEST	LTG	DISCLOSURE	PROTECT
Pre-IFRS (n=1350)									
R	1	0.2154	-0.0671	-0.0493	-0.0678	-0.1362	0.4731	-0.0447	-0.1212
MPEG	0.2154	1	-0.0703	-0.0779	-0.1811	-0.1684	0.1925	0.1168	0.0851
LNSIZE	-0.0671	-0.0703	1	0.0446	-0.3693	0.636	-0.0793	0.0146	-0.0567
DM	-0.0493	-0.0779	0.0446	1	-0.0136	0.0829	-0.0513	0.1699	0.0396
BM	-0.0678	-0.1811	-0.3693	-0.0136	1	-0.0048	-0.0887	0.0665	0.0583
NUMEST	-0.1362	-0.1684	0.636	0.0829	-0.0048	1	-0.0831	-0.0141	0.1402
LTG	0.4731	0.1925	-0.0793	-0.0513	-0.0887	-0.0831	1	-0.1899	-0.1416
DISCLOSURE	-0.0447	0.1168	0.0146	0.1699	0.0665	-0.0141	-0.1899	1	0.2783
CORRUPT	-0.1212	0.0851	-0.0567	0.0396	0.0583	0.1402	-0.1416	0.2783	1
Post-IFRS (n=1350)									
R	1	0.2846	0.0005	-0.1241	-0.1528	-0.1486	0.4452	-0.0202	-0.1518
MPEG	0.2846	1	-0.1486	-0.1555	-0.1812	-0.2642	0.306	-0.0735	0.0083
LNSIZE	0.0005	-0.1486	1	-0.0089	-0.3855	0.6673	-0.0234	-0.0179	0.0654
DM	-0.1241	-0.1555	-0.0089	1	-0.0032	-0.0098	-0.0524	0.1114	-0.0404
BM	-0.1528	-0.1812	-0.3855	-0.0032	1	-0.0308	-0.0437	0.1911	-0.0573
NUMEST	-0.1486	-0.2642	0.6673	-0.0098	-0.0308	1	-0.077	-0.0411	0.2293
LTG	0.4452	0.306	-0.0234	-0.0524	-0.0437	-0.077	1	-0.2526	-0.0838
DISCLOSURE	-0.0202	-0.0735	-0.0179	0.1114	0.1911	-0.0411	-0.2526	1	0.1794
CORRUPT	-0.1518	0.0083	0.0654	-0.0404	-0.0573	0.2293	-0.0838	0.1794	1

3.6.2 Regression Results

The first set of regression results are presented in Table 3.4. Firstly, a basic univariate model is estimated using both R and $MPEG$ (presented as specifications (1) and (2) respectively). The R measure is negative and significant ($t = -2.60$), and indicating a 150 basis point reduction in the cost of equity in the post-adoption period. While the $MPEG$ measure is negative as predicted, but now only significant at the 10% level. The multivariate specification (depicted as (3) and (4) for R and $MPEG$ as the dependent variables respectively), reveals this time that the coefficient on D is negative, but marginally insignificant, with the specification (4) coefficient on D once again insignificant. Contrary to prior literature (e.g. Gebhardt et al. (2001)), both DM and BM are negative and significant, as reported in (3) and (4). The negative result on DM in particular, makes little sense intuitively, and coupled with the result on BM, may potentially be explained by country specific factors not captured by this model.

$NUMEST$ is negative and significant for specification (4), as predicted, meaning that firms with greater analyst following exhibit a lower cost of equity. This implies that the information environment generally, and the involvement of information intermediaries in particular, are important drivers in lowering the cost of equity. Although the direction is as predicted, $NUMEST$ is insignificant for specification (3). LTG is positive and significant, for (3) and (4), but less significant for the latter. While contrary to prior empirical evidence such as La Porta (1996) and Gebhardt et al. (2001), but consistent with the notion that the LTG forecast provided by I/B/E/S may indeed to

Table 3.4 – Results: Pre-post IFRS earnings announcement regression

Results of estimating the following regression model:

$$K_{it} = \alpha_0 + \alpha_1 D_t + \alpha_2 DM_t + \alpha_3 BM_t + \alpha_4 NUMEST_t + \alpha_5 LTG_t + \\ + \alpha_6 EARLY + \alpha_6 DISCLOSURE + \alpha_7 CORRUPT + \epsilon_t$$

Identical models are estimated each with R (models 1, 3 and 5) and $MPEG$ (models 2, 4 and 6) as dependent variables. D is a dummy variable assuming a value of 0 in the pre adoption period, and 1 in the post period. $LNSIZE$ is the log of market capitalisation, DM is the debt to market ratio and BM is the book to market ratio. $NUMEST$ is the number of analysts following a given firm, LTG is the long term growth rate provided by I/B/E/S, and $EARLY$ is a dummy variable assuming a value of 1 if a firm is an early adopter, and 0 otherwise. $DISCLOSURE$ is a country level disclosure score as per CIFAR (1995), and $CORRUPT$ is a corruption index score as used by La Porta et al. (1998). T-statistics are reported below the coefficient estimates in parentheses, and are corrected for heteroscedasticity and autocorrelation in the residuals.

Variable	(1)	(2)	(3)	(4)	(5)	(6)
INTERCEPT	0.1105	0.1141	0.0670	0.0815	0.0012	0.0601
	(9.71)	(33.72)	(0.67)	(1.97)	(0.01)	(1.31)
D	-0.0151	-0.0019	-0.0083	0.0007	0.1445	0.0470
	(-2.60)	(-0.89)	(-1.75)	(0.33)	(1.72)	(2.87)
LNSIZE			-0.0002	0.0001	0.0049	0.0013
			(-0.04)	(0.04)	(0.61)	(0.65)
DM			-0.0362	-0.0102	-0.0486	-0.0010
			(-2.35)	(-1.07)	(-2.81)	(-0.10)
BM			-0.0388	-0.0150	-0.0393	-0.0094
			(-2.67)	(-2.13)	(-1.98)	(-1.29)
NUMEST			-0.0012	-0.0008	-0.0021	-0.0009
			(-1.32)	(-1.99)	(-1.62)	(-2.36)
LTG			0.3636	0.0548	0.4563	0.0549
			(2.91)	(1.78)	(3.87)	(1.84)
EARLY			-0.0165	0.0081	-0.0216	0.0059
			(-1.33)	(0.56)	(-1.34)	(0.34)
DISCLOSURE			0.0014	0.0001	0.0014	0.0001
			(3.15)	(0.26)	(3.18)	(0.27)
CORRUPT			-0.0058	0.0037	-0.0068	0.0036
			(-1.56)	(1.15)	(-1.80)	(1.11)
D*LNSIZE					-0.0104	-0.0028
					(-1.53)	(-2.60)
D*DM					0.0193	-0.0171
					(0.98)	(-2.98)
D*BM					0.0009	-0.0107
					(0.08)	(-3.29)
D*NUMEST					0.0019	0.0002
					(1.79)	(0.78)
D*LTG					-0.2838	0.0038
					(-2.76)	(0.18)
D*EARLY					0.0175	0.0045
					(1.55)	(0.58)
Observations	2700	2700	2700	2700	2700	2700
R^2	0.008545	0.001154	0.1634	0.1296	0.1859	0.1405

pessimistic, resulting in underpricing. Given the global dataset used here, a possibility of *home bias* in the LTG forecast may be present. Although no attempt is made here to identify the location of individual analysts and hence disentangle a home bias effect, specifications (5) and (6) isolates the pre-post effect. Finally, $DISCLOSURE$ is significantly positive in specification (3) only, contrary to expectation.

Finally, specifications (5) and (6) in Table 3.4 add slope dummy variables in an attempt to disentangle post-IFRS effects. The prior results from (3) and (4) remain intact. Notable exceptions include the positive and significant coefficient on D for specification (6), suggesting that the cost of equity *increased* following IFRS adoption, if measured using $MPEG$. the result in the R regression (5) supports this conclusion, albeit at a lower level of statistical significance. Turning to the results on the slope dummies, of particular interest is the result on $D*LTG$ in specification (5), and $D*SIZE$, $D*DM$ and $D*BM$ in specification (6). The $D*LTG$ result indicates that the cost of equity decreased post-IFRS for firms exhibiting higher expected long term growth. If the positive coefficient previously documented for LTG in specifications (3) and (4) is due to pessimism, then the possibility exists that the role of the IFRS may indeed reduce the home bias effect. The negative and significant result on $D*LNSIZE$ indicates that large firms enjoy a cost of equity reduction post-IFRS, as do firms with higher leverage, and book to market.

Table 3.5 presents the results of similar models to those shown in Table 3.4, but upon controlling for country and year fixed effects. The country level

Table 3.5 – Results: Pre-post IFRS earnings announcement regression - Country and year fixed effects

Results of estimating the following regression model:

$$K_{it} = \alpha_0 + \alpha_1 D_t + \alpha_2 DM_t + \alpha_3 BM_t + \alpha_4 NUMEST_t + \alpha_5 LTG_t + \\ +\alpha_6 EARLY \epsilon_t$$

Identical models are estimated each with R (models 1, 3 and 5) and $MPEG$ (models 2, 4 and 6) as dependent variables. D is a dummy variable assuming a value of 0 in the pre adoption period, and 1 in the post period. $LNSIZE$ is the log of market capitalisation, DM is the debt to market ratio and BM is the book to market ratio. $NUMEST$ is the number of analysts following a given firm, LTG is the long term growth rate provided by I/B/E/S, and $EARLY$ is a dummy variable assuming a value of 1 if a firm is an early adopter, and 0 otherwise. T-statistics are reported below the coefficient estimates in parentheses, and are corrected for heteroscedasticity and autocorrelation in the residuals.

Variable	(1)	(2)	(3)	(4)	(5)	(6)
INTERCEPT	0.2178	0.1536	0.1527	0.1604	0.0856	0.1364
	(74.93)	(142.39)	(1.08)	(5.73)	(0.52)	(4.34)
D	-0.0151	-0.0019	-0.0096	0.0006	0.1514	0.0538
	(-2.59)	(-0.89)	(-2.32)	(0.26)	(1.73)	(3.06)
LNSIZE			-0.0007	-0.0012	0.0046	0.0004
			(-0.09)	(-0.56)	(0.45)	(0.15)
DM			-0.0275	-0.0126	-0.0412	-0.0038
			(-1.06)	(-1.02)	(-1.25)	(-0.34)
BM			-0.0295	-0.0183	-0.0288	-0.0116
			(-1.33)	(-2.05)	(-1.24)	(-1.38)
NUMEST			-0.0009	-0.0006	-0.0018	-0.0007
			(-0.84)	(-1.72)	(-1.23)	(-2.54)
LTG			0.3249	0.0369	0.4088	0.0343
			(2.17)	(1.12)	(2.91)	(1.07)
EARLY			-0.0014	0.0280	-0.0070	0.0258
			(-0.11)	(1.55)	(-0.48)	(1.34)
D*LNSIZE					-0.0109	-0.0035
					(-1.58)	(-2.77)
D*DM					0.0197	-0.0154
					(0.90)	(-4.03)
D*BM					-0.0008	-0.0116
					(-0.07)	(-3.36)
D*NUMEST					0.0020	0.0004
					(1.93)	(1.28)
D*LTG					-0.2973	0.0090
					(-2.73)	(0.46)
D*EARLY					0.0197	0.0050
					(1.62)	(0.65)
Observations	2700	2700	2700	2700	2700	2700
R^2	0.1289	0.3153	0.1823	0.3769	0.2063	0.3884

variables, naturally, $DISCLOSURE$ and $CORRUPT$ are dropped here. Inferences drawn in the fixed-effects model are consistent with the results in 3.4.

Table 3.6 presents the results of the probit model in Equation 3.16. As part of the first stage of the Heckman two-step estimation, this examines the possibility that factors exist which are associated with firms opting into the IFRS prior to an official adoption date. The dependent variable here, C, is a dummy asuming a value of 1 where the firm is an early adopter, and 0 otherwise. Given the sample of early adopters, a significant and positive coefficient is present on $DISCLOSURE$. This may be due to firms within countries with more transparent accounting regimes being more agreeable to the IFRS, potentially as they are more similar to the extant domestic standards, allowing a smooth transition. Additionally, the coefficient on $LISTINGS$ is negative and weakly significant. This is contrary to the prior literature which finds that greater international financial dependance, proxied for one by the number of foreign listings, is associated with a tendency to voluntarily adopt the IFRS.

Finally, Tables 3.7 and 3.8, present the results of estimating Equation 3.17, and variants thereof. As before, the odd numbered specifications are those where R is the dependent variable, and the even are those where $MPEG$ is used. The first four specifications (1-4), identical to the previously presented results, are merely provided for comparison with the self selection controlled models (5-8). The reduced sample size however, is due to 1) The matching process necessary to calculate AbK, the *abnormal ex*

Table 3.6 – Results: Probit model of determinants of early adoption

Results of estimating the following probit model:

$$\begin{aligned} C_i &= \beta_0 + \beta_1 LNSIZE_{it} + \beta_2 EPS_{it} + \beta_3 FSALES_{it} + \beta_4 LISTINGS_{it} \\ &\quad + \beta_5 NUMEST_{it} + \beta_6 DISCLOSE_i + \beta_7 CORRUPT_i + \epsilon_{it} \end{aligned}$$

C is a dichotomous variable assuming a value of 1 if the firm is an early adopter, and 0 if the firm adopts at the official country level adoption date, $LNSIZE$ is the log of market capitalisation, EPS is earnings per share scaled by price, $FSALES$ is the level of foreign sales as a percentage of total sales, $ANALYSTS$ is the number of analysts following the firm, $LISTINGS$ is the number of foreign exchange listings, $DISCLOSURE$ is a country level disclosure score as per CIFAR (1995), and $CORRUPT$ is a corruption index score as used by La Porta et al. (1998). T-statistics are reported below the coefficient estimates in parentheses, and are corrected for heteroscedasticity and autocorrelation in the residuals.

Variable	
INTERCEPT	-4.4038
	(-2.06)
LNSIZE	0.0598
	(0.95)
EPS	0.0283
	(1.20)
FSALES	-0.0024
	(-1.06)
LISTINGS	-0.0755
	(-1.89)
NUMEST	-0.0043
	(-0.26)
DISCLOSURE	0.0728
	(3.18)
Observations	6585
R-Square	0.0874
Max-rescaled	0.1708

ante cost of equity, and hence the inclusion of early adopters only as sample firms.[4] Notably, the coefficient on D is insignificant across all specifications, indicating that the abnormal cost of equity following adoption is no different than prior to adoption. LTG is highly significant, which is a similar result to that previously documented, again, only where R is the dependent variable.

The result on $D * NUMEST$ is negative and significant, whether controlled for self-selection bias or otherwise. Therefore unlike the previous results on this variable, the cost of equity relative to the benchmark non-adopters, is lower following adoption, for firms that have greater analyst following. This result is only negative and significant where R is the dependent variable (i.e (3) and (7)). The inclusion of $LAMBDA$, produces little difference. Apart from the negative and weakly significant result on this variable in specification (6), $LAMBDA$ is insignificant. It can therefore be concluded that for the sample of early adopters included here, self-selection does not appear to be a factor.

Table 3.8 presents the fixed-effects (country and year) equivalent of 3.7 as a robustness check. With the exception of the now insignificant coefficient on $LAMBDA$ in (6), the results are otherwise identical to those presented in 3.7.

[4]Recall that the cost of equity for these firms is *abnormal* relative to a comparison of non adopters at the time, which are largely official adopters. Hence, each sample firm in these tests are early adopters only

Table 3.7 – Results: Early adopters relative to matched official adopters

Results of estimating the following regression model:

$$AbK_{it} = \alpha_0 + \alpha_1 D_t + \alpha_2 DM_t + \alpha_3 BM_t + \alpha_4 NUMEST_t + \alpha_5 LTG_t + \\ +\alpha_6 EARLY + \alpha_7 DISCLOSURE + \alpha_8 CORRUPT + \alpha_9 LAMBDA + \epsilon_t$$

Identical models are estimated each measure of AbK denoted as $RDIFF$ (models 1, 3, 5 and 8) and $MPEGDIFF$ (models 2, 4, 6 and 8) as dependent variables. D is a dummy variable assuming a value of 0 in the pre adoption period, and 1 in the post period. $LNSIZE$ is the log of market capitalisation, DM is the debt to market ratio and BM is the book to market ratio. $NUMEST$ is the number of analysts following a given firm, LTG is the long term growth rate provided by I/B/E/S. $DISCLOSURE$ is a country level disclosure score as per CIFAR (1995), and $CORRUPT$ is a corruption index score as used by La Porta et al. (1998). $LAMBDA$ is Heckman's Lambda for self selection bias correction. T-statistics are reported below the coefficient estimates in parentheses, and are corrected for heteroscedasticity and autocorrelation in the residuals.

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
INTERCEPT	-0.0247	-0.0110	0.5504	-0.0187	-0.0246	-0.0008	0.4757	-0.0864
	(-0.91)	(-1.55)	(1.45)	(-0.19)	(-0.51)	(-0.09)	(1.17)	(-0.68)
D	0.0198	0.0056	-0.1144	0.0466	0.0275	0.0062	0.0126	-0.0207
	(1.22)	(0.91)	(-0.82)	(0.55)	(1.11)	(0.81)	(-0.31)	(-0.18)
LNSIZE			-0.0190	-0.0020			-0.0110	-0.0054
			(-1.48)	(-0.44)			(-0.71)	(-0.80)
BM			-0.0000	-0.0079			-0.0546	-0.0402
			(-0.00)	(-0.17)			(-0.44)	(-2.63)
DM			-0.0947	-0.0231			-0.0466	0.0055
			(-1.25)	(-1.72)			(-0.94)	(0.10)
NUMEST			0.0019	-0.0014			0.0007	-0.0007
			(0.98)	(-1.73)			(0.29)	(-0.68)
LTG			0.6115	-0.0222			0.6134	-0.0205
			(11.71)	(-1.21)			(11.51)	(-0.97)
D*LNSIZE			0.0108	-0.0018			0.0029	0.0033
			(0.80)	(-0.27)			(0.31)	(0.38)
D*DM			0.0159	-0.0278			0.0737	-0.0532
			(1.13)	(-0.56)			(1.49)	(-1.01)
D*BM			0.0313	-0.0170			0.0141	0.0090
			(1.30)	(1.53)			(0.16)	(1.17)
D*NUMEST			-0.0026	-0.0005			-0.0030	-0.0015
			(-5.84)	(-0.46)			(-8.02)	(-1.14)
D*LTG			-0.0056	0.0054			-0.0385	0.0035
			(-0.09)	(0.14)			(-0.49)	(0.07)
DISCLOSURE			0.0024	0.0003			0.0017	0.0023
			(0.80)	(0.32)			(0.33)	(1.08)
CORRUPT			-0.0564	0.0048			-0.0546	0.0016
			(-2.19)	(0.40)			(-2.34)	(0.13)
LAMBDA					0.0067	-0.0282	-0.0280	0.0415
					(0.05)	(-1.84)	(-0.48)	(1.09)
Observations	896	896	896	896	762	762	762	762
R^2	0.002615	0.003570	0.2372	0.1812	0.005068	0.01429	0.2634	0.1822

Table 3.8 – Results: Early adopters relative to matched official adopters - Country and year fixed effects

Results of estimating the following regression model:

$$\begin{aligned} AbK_{it} &= \alpha_0 + \alpha_1 D_t + \alpha_2 DM_t + \alpha_3 BM_t + \alpha_4 NUMEST_t + \alpha_5 LTG_t + \\ &+ \alpha_6 EARLY + \alpha_7 LAMBDA + \epsilon_t \end{aligned}$$

Identical models are estimated each measure of *AbK* denoted as *RDIFF* (models 1, 3, 5 and 8) and *MPEGDIFF* (models 2, 4, 6 and 8) as dependent variables. *D* is a dummy variable assuming a value of 0 in the pre adoption period, and 1 in the post period. *LNSIZE* is the log of market capitalisation, *DM* is the debt to market ratio and *BM* is the book to market ratio. *NUMEST* is the number of analysts following a given firm, *LTG* is the long term growth rate provided by I/B/E/S. *LAMBDA* is Heckman's Lambda for self selection bias correction. T-statistics are reported below the coefficient estimates in parentheses, and are corrected for heteroscedasticity and autocorrelation in the residuals.

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
INTERCEPT	0.1447	-0.0534	0.3977	-0.0739	0.1212	-0.0722	-0.4610	-0.0326
	(1.49)	(-3.01)	(0.64)	(-0.80)	(1.06)	(-2.78)	(-1.62)	(-0.28)
D	0.0194	0.0081	-0.2509	0.0269	0.0215	0.0059	0.2947	-0.0031
	(0.98)	(1.00)	(-0.79)	(0.41)	(1.14)	(0.69)	(1.29)	(-0.03)
LNSIZE			-0.0242	0.0021			0.0242	-0.0015
			(-0.75)	(0.38)			(1.55)	(-0.21)
BM			-0.0051	-0.0187			0.1070	-0.0782
			(-0.02)	(-0.46)			(0.94)	(0.53)
DM			-0.1240	-0.0277			0.0732	-0.0301
			(-0.98)	(-0.95)			(0.58)	(-0.63)
NUMEST			0.0027	-0.0013			-0.0022	-0.0006
			(1.03)	(-1.25)			(-0.88)	(-0.42)
LTG			0.5416	-0.0055			0.5769	-0.0071
			(6.44)	(-0.23)			(11.05)	(-0.26)
D*LNSIZE			0.0196	0.0002			-0.0173	0.0018
			(0.83)	(0.03)			(-0.99)	(0.25)
D*DM			0.0739	-0.0220			0.0491	-0.0145
			(1.27)	(-0.44)			(0.33)	(-0.26)
D*BM			0.0649	-0.0144			-0.1060	0.0072
			(0.89)	(-1.04)			(-1.17)	(0.45)
D*NUMEST			-0.0032	-0.0009			-0.0005	-0.0011
			(-2.00)	(-0.88)			(-2.05)	(-0.80)
D*LTG			0.0474	-0.0020			0.0375	-0.0007
			(0.40)	(-0.05)			(0.31)	(-0.01)
LAMBDA					-0.1447	0.0213	0.0338	0.0193
					(-1.12)	(0.54)	(0.45)	(0.50)
Observations	896	896	896	896	762	762	762	762
R^2	0.1622	0.2627	0.3122	0.3337	0.1577	0.2556	0.3399	0.3528

3.7 Conclusion

This chapter tests whether switching to the IFRS as a firm's financial reporting regime is associated with a reduction in the cost of equity. Prior theoretical and empirical research affirms that more forthcoming disclosure reduces non-diversifiable estimation risk, by increasing the precision with which firm specific risk-return parameters are estimated. If future cash flows are a function of the transparency of firms in the present, then the ability to make more confident predictions should reduce the expected return. Bearing this in mind, coupled with the widespread consensus that the IFRS are indeed superior to most countries' domestic standards; then the IFRS should, at least in theory, reduce the cost of equity.

Unfortunately, much ambivalence surrounds the measurement of an ex ante cost of equity, rendering the identification of an appropriate yardstick, almost impossible. To address this, two ex ante cost of equity measures are adopted here, with the effect of IFRS adoption examined pre vs post adoption, and in the context of early adopters, against a comparison group of non-adopters.

While some evidence is revealed that the cost of equity is reduced by IFRS adoption alone, these results are not consistent across all specifications. In particular, the Pastor et al. (2008) measure is negative and significant on the pre-post dummy variable D, indicating a reduction in the cost of equity, while the Easton (2004) measure is insignificant. Although correlated, this illustrates the error by which the cost of equity is measured. As mentioned, the absence of an appropriately accurate such measure at present, means that the cost of equity, at best, is measured with error. This is always a factor which must be borne in mind when interpreting the results of research drawing upon such measures. The greater theoretical rigour inherent in the Pastor et al. (2008) measure however, coupled with the more intuitive results using this measure in this chapter, leads to the conclusion that Pastor et al. (2008) is potentially the more robust of the two measures, given the context of this research. With this measure in mind, inclusion of slope dummy terms however, reveal that the *abnormal cost of equity* is lower in the post IFRS period for early adopting firms with greater analyst following than before adoption. Interestingly, across both early and official adoptors, this same variable is positive and only weakly significant. Hence, it is possible that early adoption has its merits, particularly for firms exhibiting greater visibility afforded by higher analyst following.

Global examination of the cost of equity, amid differences in regulatory frameworks, presents an exciting and fruitful area of enquiry. Whilst this chapter examines the role of a global set of accounting standards and the perceived transparency thereof, future research could test the effect using different asset pricing models specifically geared towards international enquiry using both ex ante and ex post measures. At this stage, the greatest challenge facing researchers is the lack of consensus surrounding an appropriate ex ante yardstick. Until major steps are taken to create a more parsimonious ex ante cost of equity model, it is likely that inconsistency in results will dominate empirical research in this area.

Chapter 4

International Accounting Standards and Stock Volatility

4.1 Introduction

This paper tests whether the switch to International Financial Reporting Standards (IFRS), results in a decrease in return volatility following adoption. A simple cross sectional volatility model based on the Market Model, a measure of return volatility is observed surrounding the first earnings announcement following the first fiscal year of IFRS reporting. The model is intuitive, being derived from first principles from the Capital Asset Pricing Model (CAPM), providing an alternative to extant ad hoc specifications throughout the literature.

The notion that the IFRS have the potential to affect return volatility stems from its association with information asymmetry. Leuz and Verrecchia (2000) state that there is a reasonably unanimous theoretical link associating a reduction in information asymmetry with a lower cost of equity.

Information asymmetries create costs by inducing adverse selec-

> tion into transactions between buyers and sellers of firm shares. In real institutional settings, adverse selection is typically manifest in reduced levels of liquidity for firm shares (e.g. Copeland and Galai (1983), Kyle (1985), and Glosten and Milgrom (1985)). To overcome the reluctance of potential investors to hold firm shares in illiquid markets, firms must issue capital at a discount. Discounting results in fewer proceeds to the firm and hence higher costs of capital (Leuz and Verrecchia, 2000, p.92).

Hence, it seems reasonable to expect that means to reduce adverse selection, namely increasing public disclosure, has the potential to improve demand for a firm's stock, and hence mitigate any discount at issuance. Arguing that share price volatility is a proxy for information asymmetry, Leuz and Verrecchia (2000) test whether IFRS adoption in Germany is associated with any change in stock volatility, yet fail to reject the null. More generally, Lang and Lundholm (1993) find a positive (albeit weak) positive association between disclosure levels and stock volatility. Hence despite the theoretical intuition, empirical evidence tends to support the contention that an increase in disclosure actually *increases* stock volatility. Nevertheless, the paucity of empirical research addressing this link, and weak results thus far, leaves the question far from resolved.

Research addressing the effect of 'information events' on stock volatility, is even more scarce. Bailey et al. (2003), however, do examine stock volatility surrounding the imposition of Regulation Fair Disclosure (Reg FD) in the United States (US) in October 2000. Reg FD essentially prohibited selective disclosure of what is, in effect private information, to certain market participants such as analysts. Arguably, the subsequent trading on such information by its recipients, induces an increase in volatility of the associated stock. Therefore, a decrease in the proportion of private to public information surrounding a firm, should reduce stock volatility (Admati and Pfleiderer, 1988).

It is believed that a commitment to providing a greater level of disclosure by a firm, should reduce information asymmetries (Leuz and Verrecchia, 2000). Indeed there is a broad body of literature examining the association between corporate disclosure and proxies for information asymmetry, such as the bid-ask spread (Welker, 1995), trading volume, and stock volatility (Bushee and Noe, 2000). Despite the strong theoretical arguments supporting a negative association between disclosure and information asymmetry, empirical results to date, reveal mixed findings.

Volatility in particular, is cited as being driven by the magnitude of periodic surprises, and the price impact of trades (Bushee and Noe, 2000; Healy et al., 1999). In the former case, greater transparency, by virtue of more public disclosure, should improve the predictability of earnings and hence smoother stock returns. Diamond and Verrecchia (1991) suggest that greater public disclosure has an increasing effect on liquidity, which consequently reduces the price impact of trades. Therefore, in the event that public disclosure reduces the price impact of large trades, the information content revealed by trade should be lower, having a negative effect on volatility.

Bushee and Noe (2000) however, note that such a prediction depends largely on the clientele for a firm's stock, further suggesting that a greater number of transient investors gives rise to greater volatility following an increase in public disclosure. They identify three types of institutional investors with transient and long-term indexers at the extremes, and find that there is no net effect of an increase in public disclosure on stock volatility. Examining transient investors however, being highly dependent on public sources of information, trade aggressively on public information signals, while 'quasi-indexers' are essentially unaffected.

This chapter proceeds by testing the notion that the switch to global financial reporting standards, cited as promoting transparency, in several ways. Firstly, using the developed model of cross sectional volatility, and the inclusion of a post-IFRS dummy variable, tests are performed over the short-term and long-term. It is predicted, consistent with Bushee and Noe (2000) that transient investors will trade aggressively following the IFRS report date; resulting in an increase in volatility over this time frame. In the long term however, it is predicted that stock return volatility will decrease, due to an increase in transparency. This latter point is dependent on the country level information environment prior to adoption. This issue is addressed by including a pre-IFRS disclosure index, and fixed effects model robustness checks. Results reveal that across the entire sample of adopters, the null of no decrease in stock volatility in the 10 months following adoption, is rejected. Short term tests are less convincing, with all but one specification failing to reject the null. This provides some evidence that the behaviour of stock volatility following this information event differs, between the short and long term.

This chapter is structured as follows. Section 2 develops the measure of cross sectional stock volatility used in this paper. Sections 3 and 4 specify the empirical model and data respectively. Section 5 details the results, and section 6 concludes.

4.2 A Simple Model of Cross Sectional Volatility

To develop the cross sectional volatility model used here, the market model is used as a starting point, positing a linear relationship between returns for firm i and market returns:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \epsilon_{it} \tag{4.1}$$

Which, upon taking the variance, and setting the intercept equal to zero as implied by the CAPM, results in the following model:

$$Var(R_{it}) = \beta_i^2 Var(R_{mt}) + Var(\epsilon_{it}) \tag{4.2}$$

Three variables hence emerge as determinants of $Var(R_{it})$ through this decomposition; β_i^2, $Var(R_{mt})$, and $Var(\epsilon_{it})$, being the squared measure of systematic risk (β), the variance of the market, and the variance of unsystematic risk. Allowing each to enter as independent variables, results in the following:

$$Var(R_{it}) = \beta_1 \beta_i^2 + \beta_2 Var(R_{mt}) + \beta_3 Var(\epsilon_{it}) \tag{4.3}$$

To allow for a more intuitive interpretation of the variable β, one may take the square root of Equation (4.2), resulting in the following general, cross sectional volatility model:

$$SD(R_{it}) = \alpha + \beta_1 \beta_i + \beta_2 SD(R_{mt}) + \beta_3 SD(\epsilon_{it}) + \eta_{it} \tag{4.4}$$

Where:

$SD(R_{it}) =$ The backward standard deviation of returns for firm i at time t

$\beta_i =$ The β_i of firm i

$SD(R_{mt}) =$ The backward standard deviation of returns for the market m at time t

$SD(\epsilon_{it}) =$ The backward standard deviation of abnormal returns for firm i at time t

$\eta_{it} =$ The error term.

4.3 Empirical Model

The empirical model is equivalent to Equation (4.4), albeit modified to examine the event under investigation. Bailey et al. (2003) provide an experimental design which examines volatility surrounding Regulation FD through the inclusion of a pre-post dummy variable. Hence in addition to the variables implied by Equation (4.4), a dummy variable is included which assumes a value of 1 in the post adoption period, and 0 in the pre adoption period. With the inclusion of D, the empirical model becomes:[1]

$$SD(R_{it}) = \alpha + \beta_1 SD(R_{mt}) + \beta_2 BETA_{it} + \beta_3 D_{it} + \epsilon_{it} \tag{4.5}$$

Where:

$SD(R_{it})$	=	The backward standard deviation of returns for firm i at time t
$BETA_i$	=	The β_i of firm i
$SD(R_{mt})$	=	The backward standard deviation of returns for the market m at time t
D	=	A dummy variable assuming a value of 0 in the pre IFRS period, and 1 in the post period.
ϵ_{it}	=	The error term.

4.3.1 Self Selection Bias

Originating with Heckman (1979), the notion of self-selection may be viewed as giving rise to an omitted variable problem. Li and Prabhala (2007) illus-

[1] The term $SD(\epsilon_{it})$ is omitted in the empirical model, as it is, by definition, the residual volatility. Inclusion of which, would result in a model regressing volatility on volatility, which mitigates meaningful inferences.

trate this as follows. Assume that the following regression requires estimation:

$$Y_i = X_i\beta + \epsilon_i \tag{4.6}$$

Assume now, that a sub-sample of firms self selects into choice E. For this sub-sample of firms, the applicable regression equation becomes:

$$Y_i|E = X_i\beta + \epsilon_i|E \tag{4.7}$$

As the self-selected sub sample is not random, failure to account for self-selection results in inconsistent β estimators. In correcting for self selection bias, the first step requires identification of factors likely to explain the decision to self-select. I.e:

$$E \equiv W_i = Z_i\gamma + \eta_i > 0 \tag{4.8}$$

Where W_i is the selection variable, typically a dichotomous variable denoted as 1 for selection, and 0 otherwise. Z_i is a vector of public exogenous variables, γ is a vector of coefficients, and η_i is an error term orthogonal to γ. It therefore implies that the equivalent expression for non-selection, NE, is as follows:

$$NE \equiv W_i = Z_i\gamma + \eta_i \leq 0 \tag{4.9}$$

Therefore, to estimate Equation 4.6 in the presence of self selection, and taking its expectation, and substituting in 4.8, the expression becomes:

$$
\begin{aligned}
Y_i|E &= X_i\beta + (\epsilon_i|Z_i\gamma + \eta_i > 0) \\
&= X_i\beta + \pi(\epsilon_i|Z_i\gamma + \eta_i > 0) + v_i \qquad (4.10)
\end{aligned}
$$

The expression in Equation (4.10) follows from the notion that $\epsilon_i|\eta_i = \pi\eta_i + v_i$, a regression of ϵ_i on η_i, where π is therefore the coefficient, and v_i is the orthogonal error term. An equivalent expression for firms which do not self select into the choice under investigation may similarly be derived, by substituting Equation (4.9) into Equation (4.6). Taking expectations, and denoting the second term in Equation (4.10) as $\lambda_C(Z_i\gamma)$, Li and Prabhala (2007) present the following expression, which captures the essence of Heckman (1979):

$$
E(Y_i|C) = X_i\beta + \pi\lambda_C(Z_i\gamma) \qquad (4.11)
$$

Where π is the coefficient on the *inverse mills ratio*, and C denotes the choice to self select, or otherwise, by the firm. Examination of Equation (4.11) clearly reveals the omitted variable problem. Estimation of Equation (4.6) omits the final term in Equation (4.11), which arises due to a subset of firms self selecting into a given choice. Voluntary adoption into a particular disclosure regime, or in this case, early adoption, provides a classic example of the self selection problem. Therefore, a 2-step Heckman estimation to account for potential self selection bias requires, in addition to a vector of explanatory variables X_i, but also a vector Z_i of public variables which, according to theory, are expected to predict the self selection decision. The following section elaborates the choice of Z_i as applicable to this paper; firm specific variables associated with early IFRS adoption.

Early adoption: Probit model to account for self-selection

Much of the literature in accounting suggests systematic characteristics of firms which essentially opt in, or voluntarily provide financial disclosure above a minimum requirement. For example, Healy et al. (1999) finds that firms that intend on raising external capital within the United States provide additional voluntary disclosure prior to the issuance. Further, firms which have higher visibility are more inclined to provide voluntary disclosure. For example, large firms tend to be more transparent (Ahmed and Courtis, 1999; Lang and Lundholm, 1993), as do firms which are cross-listed (Lang et al. 2003).

International evidence tends to reveal similar results at the global level, albeit with external dependence emerging as a consistently important factor. Ashbaugh (2001) for instance, finds that the choice to voluntarily report under either the international accounting standards (IAS) or United States (US) Generally Accepted Accounting Principles (GAAP), by non-US firms is associated with the number of foreign listings, the existence of a forthcoming stock issuance, and the transparency afforded by the extant domestic standards. Furthermore, Dumontier and Raffournier (1998), El-Gazzar et al. (1999), Murphy (1999), and Cuijpers and Buijink (2005), all find that the dispersion of foreign operations is highly associated with the decision to adopt non-local GAAP, in accord with the notion that such firms exhibit heterogeneity in their stakeholder base.

Prior empirical literature specifically examining the decision to voluntarily opt into the IFRS regime, follows the above. Hung and Subramanyam (2007), in examining the shift of German firms to the IFRS, control for potential self-selection bias by running a probit regression of the decision to voluntarily adopt, on return on assets, leverage, size, cross listing, increase in common stock, increase in long term debt, and industry and year dummies. Consistent with the prior studies, the size coefficient is positive and highly significant. Based on the visibility and foreign dependence arguments, the following first-stage regression is specified:

$$\begin{aligned} C_i &= \beta_0 + \beta_1 LNSIZE_{it} + \beta_2 EPS_{it} + \beta_3 FSALES_{it} \\ &\quad + \beta_4 LISTINGS_{it} + \beta_5 NUMEST_{it} + \beta_6 DISCLOSE_i \\ &\quad + \beta_7 CORRUPT_i + \epsilon_{it} \end{aligned} \tag{4.12}$$

Where:

$C_i =$ A dichotomous variable assuming a value of 1 if the firm is a voluntary adopter, or 0 otherwise.

$LNSIZE_{it} =$ The natural log of size for i at time t

$EPS_{it} =$ Earnings per share for firm i at time t

$FSALES_{it} =$ Foreign sales as a proportion of total sales for firm i at time t

$LISTINGS_{it} =$ The number of foreign listings for firm i at time t

$NUMEST_{it} =$ The number of analysts following firm i at time t

$DISCLOSE_i =$ Local GAAP based disclosure/transparency score for firm i

$CORRUPT =$ a corruption index score, as per La Porta et al. (1998).

Time t denotes the time of the switch to the IFRS, or more specifically, the most recent data prior to adoption.

A second stage Heckman model is now specified, which is identical to Equation (4.5), albeit now with the inclusion of Heckman's Lambda. Hence, the second stage model is:

$$SD(R_{it}) = \alpha + \beta_1 SD(R_{mt}) + \beta_2 BETA_{it} + \beta_3 D_{it} + \beta_4 LAMBDA_{it} + \epsilon_{it} \quad (4.13)$$

Where:

$SD(R_{it}) =$ The backward standard deviation of returns for firm i at time t

$BETA_i =$ The β_i of firm i

$SD(R_{mt}) =$ The backward standard deviation of returns for the market m at time t

$D =$ A dummy variable assuming a value of 0 in the pre IFRS period, and 1 in the post period

$LAMBDA =$ Heckman's Lambda.

$\epsilon_{it} =$ The error term.

4.4 Data

Thompson Financial Worldscope provides annual data regarding the standards adopted by firms, at the global level. Identification of of the first IFRS earnings announcement involves firstly identifying the first fiscal year end where IFRS is stated as the applied standards. If the reported standards at t are the IFRS, and domestic standards are applied in year $t-1$, then year t is identified as the switch year. The month of the first earnings announcement following the IFRS switch year end, also obtained from Worldscope, is month $t = 0$ for the purpose of this research. The window of inclusion is 1998-2008, following the move towards improvement in the quality of the IFRS from 1998, when IOSCO indicated the desire to endorse the global standards. Given this time frame, the number of firms for which standards adoption data is available is 18761. Of these, a total of 5856 firms are identified as

IFRS adopters, with 571 of which, being early adopters.[2]

Returns data necessary for the volatility measures are obtained from Datastream, with firm daily returns in particular, calculated from Datastream's total return index. Further, market indices for each country are also also obtained from Datastream, facilitating the calculation of the market level volatility for each country. Volatility is calculated for each month, as the backwards standard deviation of total returns over the 20 trading days prior to the beginning of each month. Given this requirement, the post-IFRS observations begin from $t + 2$, with the $t + 1$ returns being used to calculate $SD(R_{it})$ and $SD(R_{im})$ for $t + 2$, and the returns of each subsequent month used as the basis for the volatility measured at each following month thereafter. $BETA$ is based on estimation of the market model:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \epsilon_{it} \tag{4.14}$$

$BETA$ is estimated separately over the 250 days pre and 250 days post IFRS adoption, hence each firm has a separate pre and post IFRS $BETA$ observation. Additionally, to be included in the sample, an adopting firm must have 10 months of data both pre and post IFRS. Bushee and Noe (2000) find that higher disclosure is associated with lower subsequent stock return volatility, however other research concludes the opposite result (Lang and Lundholm, 1993; Leuz and Verrecchia, 2000). The latter results are

[2]An early adopter is a firm which adopts the IFRS prior to a country level requirement to do so. Details on country IFRS adoption requirements are provided by http://www.iasplus.com (Deloitte).

attributed to aggressive trading on the information inherent in greater disclosure, with Bushee and Noe (2000) in particular, finding that firms known for greater transparency, attract transient investors which trade aggressively on earnings releases. It is therefore expected that in such an event, the association between greater transparency, by way of IFRS adoption, has a differential effect in the short and long term. To capture these differences, in addition to the 10 month pre-post data requirement (long-term effect), a set of 3 month pre-post IFRS adoption tests are also conducted. The 10-month pre-post final sample is 27914 firm month observations (13957 pre and 13957 post IFRS).

4.5 Results

The results of the aforementioned empirical models are examined in this section. Firstly, descriptive statistics both pre and post IFRS adoption of the variables under consideration, are presented. Estimation of Equations (4.4) and (4.13), and variations thereof, follow.

As a matter of exposition, the time series behaviour of volatility surrounding the first instance of IFRS earnings, is presented in Figures 4.1 and 4.2. Figure 4.1, in which the horizontal axis is the mean backward standard deviation of returns over 20 trading days across the entire sample, reveals an increase in volatility subsequent to $t = 0$.[3] This diagram reveals a striking

[3]It is important to consider the effect of a backward 20-day window used to calculate each daily measure of volatility. Each day from $t = 0$ to $t = 20$, will incorporate the effect of returns *prior* to $t = 0$, as reflected by the the gradual increase in volatility between

change in the behaviour of stock volatility following $t = 0$.

Recall the inconclusive state of the literature regarding the precise directional association between disclosure and stock volatility. Although transparency should decrease volatility, according to theory, prior research by Bushee and Noe (2000) for example, suggests that disclosure increases due to transient investors trading aggressively on such information. It may therefore be the case that the the association may differ between the short and long term. In the short term, following the release of accounting information, transient investors reliant on such information, may indeed trade aggressively. However, in the presence of market efficiency, one would assume that in the long term, not only would any perceived mispricing be arbitraged away; those capable of unique interpretation of such reports (Leuz and Verrecchia, 2000), would be long gone. As such, the empirical specifications within this chapter are tested over 3-months and 10-months pre and post the IFRS earnings release, to capture the short and long run effects respectively.

4.5.1 Descriptive Statistics

Table 4.1 presents descriptive statistics by country. Firm stock return volatility ($SDRI$) (market volatility ($SDRM$)) range from 0.2355 (0.1108) for Spain, to 0.5517 (0.3368) for China. Given that daily return data is used to calculate $BETA$, Scholes and Williams (1977) $BETA$ values are reported for robustness. $BETA$ ranges in value, from 0.4979 for the sample of Belgian firms, to 1.1259 for the Czech Republic. With the exception of the latter

$t = 0$ and $t = 20$

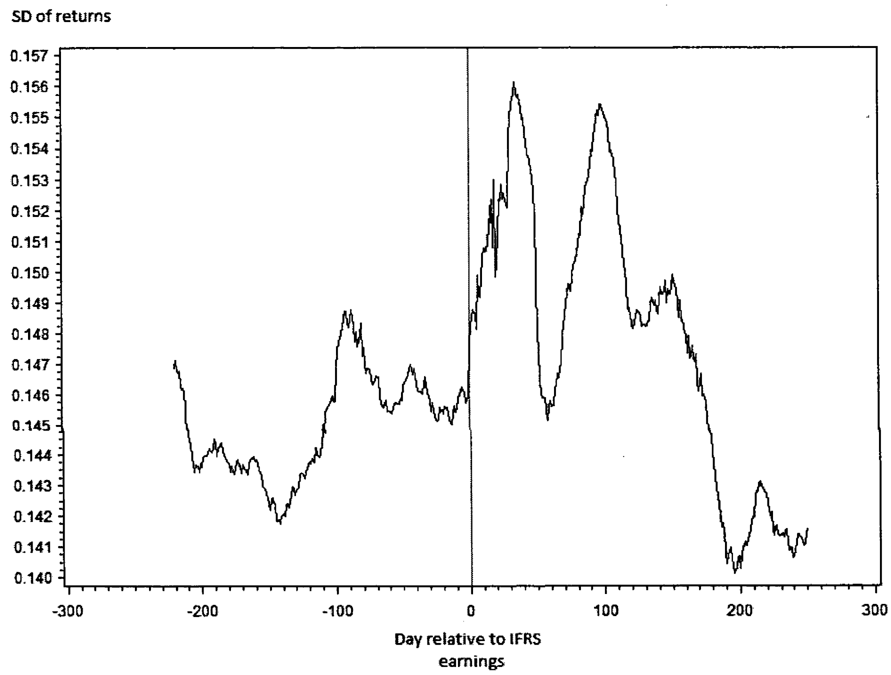

Figure 4.1 – Return volatility surrounding IFRS report date

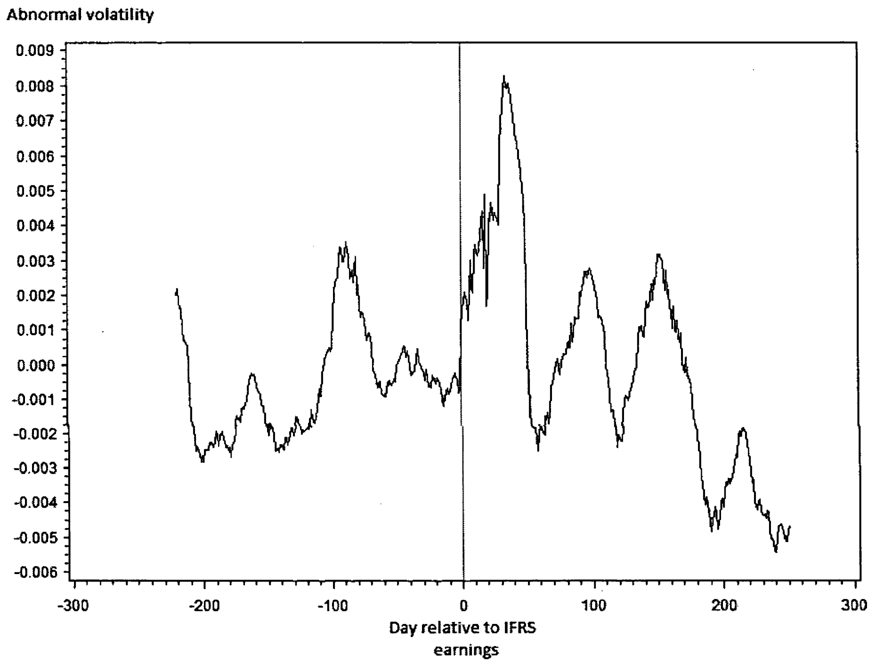

Figure 4.2 – Abnormal return volatility surrounding IFRS report date

country, all mean values of $BETA$ are below 1, indicating that the sample of firms, at the country level, are less risky than their respective markets. Scholes and Williams (1977) $BETAs$ are quantitatively similar to unadjusted $BETA$ values, but are generally slightly higher, indicating a small degree of downward bias as suggested by Scholes and Williams (1977).

Table 4.1 – Descriptive Statistics by Country

SDRI is the volatility of of firm i, calculated as the backwards standard deviation over the prior 20 trading days, *SDRM*

is the volatility of the market of firm i, calculated over the prior 20 trading days, *RI* and *RM* are returns for firm i, and the market respectively, *BETA* is a separate pre and post IFRS β for firm i, calculated using the market model over the 250 trading prior to, and post the first IFRS announcement day, and *BETASW* are Scholes and Williams (1977) corrected Betas.

Country	Variable	n	Mean	StDev	Min	Max	Q1	Median	Q3	Q3-Q1
AT	RI	260	-0.0697	0.3309	-1.3491	0.962	-0.1937	0	0.0421	0.2357
	RM	260	-0.0194	0.1894	-0.7537	0.3762	-0.0503	0.0012	0.0601	0.1105
	SDRI	258	0.3128	0.1587	0.084	1.148	0.2015	0.278	0.3716	0.1702
	SDRM	260	0.1158	0.0531	0.0521	0.3188	0.0767	0.1067	0.1385	0.0617
	BETA	260	0.6482	0.4577	-0.0661	1.4335	0.2837	0.4754	1.1603	0.8766
	BETASW	260	0.6475	0.5104	-0.2518	1.5235	0.2261	0.6014	1.1242	0.8981
AU	RI	5800	0.0118	0.4075	-3.0533	5.1343	-0.1446	0	0.1495	0.294
	RM	5800	0.0112	0.1319	-0.5101	0.5312	-0.0438	0.0428	0.0954	0.1392
	SDRI	5800	0.3213	0.1703	0.0724	1.1928	0.2018	0.2783	0.3975	0.1958
	SDRM	5800	0.117	0.0347	0.041	0.44	0.0892	0.118	0.1302	0.0409
	BETA	5800	0.6163	0.3893	-0.1454	1.6913	0.2858	0.6116	0.888	0.6021
	BETASW	5800	0.703	0.4713	-0.2512	1.9969	0.357	0.63	1.0297	0.6727
BE	RI	900	0.0293	0.3167	-4.6093	2.7246	-0.0604	0	0.1375	0.1979
	RM	900	0.0399	0.0947	-0.7106	0.3607	0.0015	0.0479	0.0977	0.0963
	SDRI	899	0.2363	0.1344	0.0729	1.0553	0.1477	0.2025	0.2811	0.1333
	SDRM	900	0.1063	0.0607	0.0528	0.4783	0.0701	0.0906	0.1151	0.045
	BETA	900	0.4979	0.3699	-0.0863	1.4996	0.2238	0.3948	0.7699	0.5461
	BETASW	900	0.5834	0.3686	-0.1805	1.4279	0.302	0.5299	0.8736	0.5716
CN	RI	660	0.0421	0.5539	-1.5876	1.6176	-0.1115	0	0.1396	0.2511
	RM	660	0.0824	0.3273	-0.626	0.9237	-0.1361	0.0028	0.2756	0.4117
	SDRI	660	0.5517	0.2105	0.1357	1.1409	0.4117	0.5279	0.6743	0.2626
	SDRM	660	0.3368	0.1027	0.1446	0.6537	0.2636	0.3127	0.4216	0.158
	BETA	660	0.7423	0.2334	0.2734	1.3331	0.5769	0.7173	0.8661	0.2892
	BETASW	660	0.6992	0.2579	0.2556	1.3039	0.5062	0.6598	0.8681	0.362
CZ	RI	80	0.0068	0.3159	-0.7938	0.82	-0.1778	0	0.119	0.2967

	RM	80	-0.0165	0.2022	-0.3185	0.4684	-0.119	-0.0077	0.0665	0.1855
	SDRI	80	0.3703	0.1928	0.0972	1.069	0.2379	0.3025	0.5072	0.2693
	SDRM	80	0.1958	0.0826	0.0707	0.4777	0.1467	0.1782	0.2167	0.07
	BETA	80	1.1259	0.249	0.7275	1.44	0.9317	1.0884	1.3998	0.4681
	BETASW	80	1.1476	0.2128	0.8271	1.4849	0.9573	1.1797	1.2972	0.3399
DE	RI	4000	0.0564	0.593	-2.8503	27.2772	-0.1184	0	0.2001	0.3185
	RM	4000	0.0401	0.1617	-0.8236	0.4973	0.0008	0.0661	0.1439	0.1431
	SDRI	3999	0.3523	0.1828	0.0725	1.1901	0.2218	0.3092	0.4402	0.2183
	SDRM	4000	0.1433	0.0784	0.0563	0.4702	0.083	0.119	0.1805	0.0975
	BETA	4000	0.5896	0.421	-0.1664	1.7194	0.2585	0.523	0.8808	0.6223
	BETASW	4000	0.6413	0.4439	-0.2325	1.9522	0.3028	0.5665	0.9485	0.6457
DK	RI	1460	0.0676	0.3152	-1.4547	2.3447	-0.0802	0	0.1781	0.2584
	RM	1460	0.0758	0.1064	-0.4838	0.3827	0.001	0.0793	0.1279	0.1269
	SDRI	1460	0.2837	0.1462	0.0766	1.0478	0.1824	0.2416	0.3488	0.1664
	SDRM	1460	0.1312	0.0601	0.0538	0.3855	0.0951	0.1091	0.14	0.0449
	BETA	1460	0.5971	0.3211	-0.1472	1.5394	0.3621	0.5725	0.8511	0.489
	BETASW	1460	0.6389	0.3679	-0.1787	1.7218	0.3634	0.6169	0.8624	0.499
ES	RI	1360	0.0941	0.3132	-0.8052	3.3594	-0.0515	0.0165	0.17	0.2216
	RM	1360	0.0456	0.1041	-0.2253	0.2571	-0.0083	0.0424	0.1057	0.114
	SDRI	1360	0.2355	0.11	0.0747	0.9808	0.1591	0.2101	0.281	0.122
	SDRM	1360	0.1108	0.0399	0.0508	0.3803	0.086	0.0951	0.1329	0.0469
	BETA	1360	0.8317	0.3273	0.0809	1.5883	0.6331	0.8293	1.0391	0.4059
	BETASW	1360	0.8789	0.3488	0.0433	1.7266	0.642	0.8989	1.097	0.4551
FI	RI	1780	0.0437	0.3139	-2.3305	2.3738	-0.0703	0	0.1583	0.2286
	RM	1780	0.0526	0.1269	-0.733	0.8249	-0.0502	0.0585	0.1205	0.1706
	SDRI	1780	0.2869	0.141	0.0734	1.1262	0.1889	0.2532	0.3486	0.1597
	SDRM	1780	0.1618	0.0727	0.0842	0.6226	0.1122	0.1453	0.1962	0.084
	BETA	1780	0.5047	0.2969	-0.1644	1.5646	0.2873	0.4621	0.6983	0.4111
	BETASW	1780	0.5355	0.2956	-0.0785	1.5748	0.3468	0.4903	0.7069	0.3601
FR	RI	5500	0.0537	0.3562	-3.0916	4.7778	-0.085	0	0.1585	0.2435
	RM	5500	0.049	0.1019	-0.5426	0.2993	0.0016	0.0602	0.1193	0.1178
	SDRI	5500	0.2796	0.1482	0.0724	1.1848	0.1792	0.2438	0.336	0.1568
	SDRM	5500	0.1177	0.0459	0.068	0.3655	0.0866	0.105	0.1244	0.0378
	BETA	5500	0.5923	0.3714	-0.0825	1.635	0.3112	0.5515	0.8532	0.542
	BETASW	5500	0.7057	0.4033	-0.2532	1.992	0.4225	0.7053	0.9654	0.5429

GB	RI	60	0.124	0.4873	-0.9415	2.0677	-0.0704	0	0.1871	0.2575
	RM	60	0.0581	0.0957	-0.2628	0.1974	0.0018	0.0641	0.1368	0.1351
	SDRI	60	0.4262	0.2302	0.1083	1.1656	0.249	0.3674	0.5177	0.2687
	SDRM	60	0.106	0.0473	0.0459	0.254	0.0739	0.0943	0.1287	0.0548
	BETA	60	0.9107	0.4826	0.2738	1.6084	0.3314	1.0314	1.1879	0.8565
	BETASW	60	0.7981	0.4414	0.1559	1.5865	0.5351	0.7583	0.9946	0.4595
GR	RI	2840	0.0478	0.4649	-3.1443	4.656	-0.1421	0	0.195	0.3371
	RM	2840	0.0578	0.1444	-1.2073	0.8561	0.0014	0.0564	0.1186	0.1173
	SDRI	2840	0.3834	0.196	0.0758	1.1932	0.2424	0.3298	0.4764	0.234
	SDRM	2840	0.1502	0.0663	0.082	0.5481	0.1114	0.1281	0.1494	0.0379
	BETA	2840	0.8692	0.3705	-0.0774	1.7323	0.6292	0.8484	1.1463	0.5171
	BETASW	2840	0.7885	0.3611	-0.2147	1.7046	0.5631	0.7955	1.0089	0.4458
HU	RI	60	-0.0395	0.3496	-1.1783	1.1337	-0.1635	0	0.0388	0.2024
	RM	60	0.0766	0.1314	-0.2275	0.3138	0.0012	0.0527	0.2013	0.2001
	SDRI	60	0.3524	0.1792	0.0994	0.9337	0.2092	0.3033	0.4834	0.2743
	SDRM	60	0.2103	0.0673	0.125	0.3751	0.1612	0.1867	0.229	0.0679
	BETA	60	0.3271	0.2859	0.0482	0.8048	0.1003	0.196	0.617	0.5167
	BETASW	60	0.3909	0.2137	0.1781	0.7793	0.1799	0.3353	0.5375	0.3575
IE	RI	580	0.051	0.3534	-1.9537	3.541	-0.0235	0.0011	0.1473	0.1708
	RM	580	0.0596	0.1045	-0.3049	0.2868	0.0012	0.0423	0.1244	0.1232
	SDRI	580	0.2923	0.1645	0.0724	0.9732	0.1813	0.2437	0.3499	0.1685
	SDRM	580	0.1251	0.0604	0.0542	0.3207	0.0882	0.1029	0.1392	0.051
	BETA	580	0.5973	0.3427	-0.0894	1.3107	0.3302	0.5583	0.9026	0.5725
	BETASW	580	0.6146	0.3731	-0.2519	1.2084	0.3598	0.628	0.9149	0.5552
IL	RI	80	0.1194	0.3163	-0.5947	1.1326	-0.027	0.0522	0.2697	0.2966
	RM	80	0.0599	0.1714	-0.4036	0.3414	-0.052	0.074	0.1786	0.2306
	SDRI	80	0.2857	0.1175	0.0997	0.8861	0.2096	0.2869	0.3333	0.1237
	SDRM	80	0.152	0.0505	0.0611	0.2585	0.1117	0.1431	0.1807	0.069
	BETA	80	0.9537	0.2551	0.6032	1.2818	0.6751	1.0149	1.1823	0.5072
	BETASW	80	1.0562	0.3217	0.5372	1.4636	0.7411	1.1951	1.2882	0.5471
IT	RI	2960	0.0564	0.3104	-2.0284	3.299	-0.0833	0	0.1542	0.2375
	RM	2960	0.0534	0.0925	-0.4477	0.4133	-0.0009	0.0803	0.1129	0.1138
	SDRI	2960	0.2565	0.1284	0.0733	1.1725	0.1727	0.2239	0.3013	0.1286
	SDRM	2960	0.1097	0.0463	0.0506	0.5685	0.0784	0.0943	0.1443	0.066

	BETA	2960	0.766	0.3268	0.0695	1.6891	0.5314	0.7272	0.9911	0.4597
	BETASW	2960	0.8541	0.3885	-0.216	1.9018	0.5937	0.827	1.1221	0.5284
LU	RI	40	0.005	0.5353	-1.8704	1.422	-0.1519	0	0.2253	0.3771
	RM	40	0.0195	0.1243	-0.2806	0.3447	-0.0509	0.0011	0.0585	0.1095
	SDRI	39	0.5834	0.2476	0.2022	1.1229	0.3992	0.5492	0.7195	0.3203
	SDRM	40	0.1676	0.1009	0.0773	0.5515	0.0993	0.1375	0.203	0.1037
	BETA	40	0.5263	0.064	0.4239	0.5958	0.4793	0.5428	0.5733	0.094
	BETASW	40	0.7215	0.4133	0.3588	1.3749	0.3771	0.5761	1.0659	0.6888
MY	RI	40	0.0687	0.4512	-0.8004	1.411	-0.0752	0	0.1352	0.2104
	RM	40	-0.0715	0.2808	-0.7007	0.7357	-0.2091	-0.0907	0.0577	0.2668
	SDRI	40	0.3366	0.1719	0.1045	0.7542	0.204	0.2822	0.4307	0.2266
	SDRM	40	0.2137	0.0737	0.0938	0.4051	0.1572	0.2124	0.2528	0.0956
	BETA	40	0.5036	0.1883	0.3046	0.7741	0.3327	0.4679	0.6746	0.3419
	BETASW	40	0.6136	0.1514	0.4689	0.8643	0.5133	0.5606	0.7138	0.2005
NL	RI	20	0.1138	0.4853	-0.5606	1.4557	-0.1542	0	0.2582	0.4124
	RM	20	-0.017	0.155	-0.4722	0.188	-0.1039	0.0018	0.0886	0.1925
	SDRI	20	0.5058	0.2052	0.2695	1.0579	0.3682	0.4754	0.5278	0.1596
	SDRM	20	0.1639	0.0986	0.0725	0.5139	0.1032	0.144	0.1669	0.0637
	BETA	20	0.9353	0.4219	0.5241	1.3466	0.5241	0.9353	1.3466	0.8224
	BETASW	20	1.0653	0.4629	0.6141	1.5164	0.6141	1.0653	1.5164	0.9023
NO	RI	20	0.1622	0.4525	-0.4896	1.7836	-0.0212	0.0539	0.3071	0.3283
	RM	20	0.095	0.1424	-0.1843	0.3613	0.0013	0.0714	0.1981	0.1968
	SDRI	20	0.4031	0.1224	0.1853	0.6196	0.3113	0.4055	0.4836	0.1723
	SDRM	20	0.2079	0.104	0.1095	0.4949	0.1386	0.1834	0.2198	0.0812
	BETA	20	0.8015	0.1698	0.636	0.9669	0.636	0.8015	0.9669	0.3309
	BETASW	20	0.7416	0.1953	0.5512	0.9319	0.5512	0.7416	0.9319	0.3807
NZ	RI	20	-0.0743	0.1764	-0.4499	0.2017	-0.1798	0	0.0228	0.2025
	RM	20	-0.0016	0.0641	-0.1887	0.1069	-0.0258	0.0025	0.0269	0.0527
	SDRI	20	0.3337	0.1115	0.1858	0.6768	0.2411	0.3177	0.3967	0.1556
	SDRM	20	0.0858	0.0266	0.0468	0.1587	0.0678	0.0827	0.0955	0.0277
	BETA	20	1.1791	0.0581	1.1224	1.2357	1.1224	1.1791	1.2357	0.1133
	BETASW	20	1.2505	0.177	1.078	1.4231	1.078	1.2505	1.4231	0.345
PL	RI	20	0.1044	0.2675	-0.3337	0.6629	-0.0393	0	0.2179	0.2572
	RM	20	0.0516	0.1288	-0.2274	0.3164	-0.0074	0.0524	0.1162	0.1236

SDRI	20	0.2763	0.112	0.1181	0.5724	0.1859	0.257	0.3539	0.1679
SDRM	20	0.1698	0.0566	0.1106	0.294	0.1264	0.1527	0.1934	0.067
BETA	20	0.5931	0.2351	0.364	0.8222	0.364	0.5931	0.8222	0.4583
BETASW	20	0.6851	0.1858	0.504	0.8663	0.504	0.6851	0.8663	0.3622

Table 4.2 contains descriptive statistics pre, and post IFRS respectively. The most salient of results here, is the greater volatility stated for the post-IFRS period (0.3149, vs 0.3073 pre-IFRS). However, this appears to be consistent with the mean market volatility difference between the two periods. Examination of $BETA$ provides some evidence that relative to the market, the sample of IFRS adopters show an increase in volatility which is economically significant (from 0.5991 to 0.7058). Taken together, the descriptive statistics within Table 4.2, suggest greater volatility following IFRS adoption.

Table 4.2 – Descriptive Statistics: pre vs post IFRS

SDRI is the volatility of of firm i, calculated as the backwards standard deviation over the prior 20 trading days, *SDRM* is the volatility of the market of firm i, calculated over the prior 20 trading days, *RI* and *RM* are returns for firm *i*, and the market respectively, *BETA* is a separate pre and post IFRS β for firm i, calculated using the market model over the 250 trading prior to, and post the first IFRS announcement day, and *BETASW* are Scholes and Williams (1977) corrected Betas.

	Variable	n	Mean	StDev	Min	Max	Q1	Median	Q3	Q3-Q1
Pre-IFRS	RI	14270	0.0706	0.469	-2.8503	27.2772	-0.0898	0	0.201	0.2908
	RM	14270	0.0719	0.1305	-1.2073	0.9237	0.0103	0.0808	0.1557	0.1454
	SDRI	14265	0.3081	0.1732	0.0724	1.1932	0.1887	0.2604	0.3794	0.1907
	SDRM	14270	0.1233	0.0667	0.041	0.6537	0.0854	0.1042	0.136	0.0506
	BETA	14270	0.6005	0.3738	-0.1644	1.6913	0.3097	0.5751	0.8623	0.5527
	BETASW	14270	0.6816	0.4248	-0.2532	1.9969	0.3641	0.6536	0.9436	0.5794
Post-IFRS	RI	14270	0.0196	0.3491	-4.6093	5.1343	-0.1099	0	0.1281	0.238
	RM	14270	0.0133	0.1344	-0.7106	0.9237	-0.0537	0.0021	0.0872	0.1409
	SDRI	14270	0.3154	0.1699	0.0724	1.1901	0.1967	0.2722	0.3852	0.1885
	SDRM	14270	0.1413	0.0678	0.0468	0.5685	0.0955	0.124	0.1652	0.0697
	BETA	14270	0.7052	0.3858	-0.1664	1.7323	0.398	0.691	0.9824	0.5844
	BETASW	14270	0.7381	0.4033	-0.2519	1.9815	0.432	0.7235	1.0227	0.5907

Table 4.3 provides cross correlations for the variables used in the analysis. As expected, $BETA$ and $BETASW$ are highly correlated, and there appears to little concern regarding collinearity between the dependent variables.

Table 4.3 – Summary of cross-correlations: pre vs post IFRS

SDRI is the volatility of of firm i, calculated as the backwards standard deviation over the prior 20 trading days, *SDRM* is the volatility of the market of firm i, calculated over the prior 20 trading days, *RI* and *RM* are returns for firm i, and the market respectively, $BETA$ is a separate pre and post IFRS β for firm i, calculated using the market model over the 250 trading prior to, and post the first IFRS announcement day, and $BETASW$ are Scholes and Williams (1977) corrected Betas.

Variable	SDRI	SDRM	RI	RM	BETA	BETASW
Pre-IFRS (n=14270)						
SDRI	1	0.344	0.072	-0.051	0.1	0.1123
SDRM	0.344	1	-0.0506	-0.1418	0.0001	-0.0379
RI	0.072	-0.0506	1	0.1749	0.0639	0.0617
RM	-0.051	-0.1418	0.1749	1	-0.0115	-0.0043
BETA	0.1	0.0001	0.0639	-0.0115	1	0.7972
BETASW	0.1123	-0.0379	0.0617	-0.0043	0.7972	1
Post-IFRS (n=14270)						
SDRI	1	0.3717	0.0287	0.0322	0.1482	0.1112
SDRM	0.3717	1	-0.0267	-0.0141	0.0155	-0.0318
RI	0.0287	-0.0267	1	0.2413	0.0134	0.0124
RM	0.0322	-0.0141	0.2413	1	0.0025	-0.0136
BETA	0.1482	0.0155	0.0134	0.0025	1	0.7853
BETASW	0.1112	-0.0318	0.0124	-0.0136	0.7853	1

4.5.2 Regression Results

Table 4.4 reports the results of estimation of Equation (4.4)[4], with the inclusion of slope dummies to isolate any post IFRS effect. T-statistics are in

[4]Like Bailey et al. (2003), size, dispersion in analyst forecasts, and analyst forecast error, were also included as independent variables (untabulated). Inclusion of these variables added little to the inferences drawn, and in the case of analyst forecast variables, reduced the sample size substantially. As a result, these variables were dropped from further analysis.

parentheses below the parameter estimates, and are based on clustered standard errors, clustered on country and firm. Model (1) is the Equation (4.4) specification, which includes two country level variables, $DISCLOSURE$ and $CORRUPT$, to control for the pre-IFRS reporting environment. Specifications (2)-(4) are fixed effects models, with fixed effects on country (2), year (3) and both country and year (4).

For all results, the first column includes two country level variables, $DISCLOSURE$ and $CORRUPT$, which are to control for the pre-IFRS reporting environment, and the remaining three are country, year, and both country and year fixed effects models. Consistent with the devised cross-sectional model, market volatility $SDRM$ and $BETA$, are positive and highly significant across all specifications. Inclusion of the $EARLY$ dummy variable is to no avail, being insignificant. D however, the variable of interest, is negative and highly significant across all specifications. Hence, given the model specified, the null of no effect on volatility post-IFRS, is rejected. The three slope dummies, included to isolate post-IFRS effects given the independent variables, reveal that for specifications (1) and (2), the association between $SDRM$ and $SDRI$ is higher in the post period.

Table 4.5 estimates identical models, albeit over the 3 months either side of the IFRS reporting date. As with the 10 month tests, the variables $SDRM$ and $BETA$ are positive and significant. $EARLY$ is positive and significant for specification (2), suggesting that early adopters experience an increase in volatility during the 3 months following the IFRS report date, which accounting for country fixed effects. D, which reflects the post IFRS increase

Table 4.4 – Results: 10-months pre-post earnings announcement regression

Results of estimating the following regression model:

$$\begin{aligned} SDR_{it} &= \alpha_0 + \alpha_1 SDR_{mt} + \alpha_2 Beta_i + \alpha_3 D_{it} + \alpha_4 SDR_{mt} * D_{it} \\ &+\alpha_5 Beta_i * D_t + \alpha_6 DISCLOSE_i + \alpha_7 CORRUPT_i + \epsilon_i \end{aligned}$$

SDR_{it} is the volatility of of firm i, calculated as the backwards standard deviation over the prior 20 trading days, SDR_{mt} is the volatility of the market of firm i, calculated over the prior 20 trading days, $Beta_i$ is a separate pre and post IFRS β for firm i, calculated using the market model over the 250 trading prior to, and post the first IFRS announcement day, and D is a dummy variable assuming a value of 0 in the pre IFRS period, and 1 in the post period. $DISCLOSURE$ is a country level disclosure score as per CIFAR (1995), and $CORRUPT$ is a corruption index score as used by La Porta et al. (1998). Specification (1) controls for country differences through the inclusion of $DISCLOSURE$ and $CORRUPT$, while (2)-(4) are country, year, and country-year fixed effects models respectively. T-statistics are reported below the coefficient estimates in parentheses, and are corrected for heteroscedasticity and autocorrelation in the residuals.

Variable	(1)	(2)	(3)	(4)
INTERCEPT	0.1965	0.1325	0.1968	0.1296
	(1.51)	(18.25)	(8.40)	(9.08)
SDRM	0.7106	0.6856	0.7806	0.6779
	(10.04)	(18.72)	(11.53)	(15.01)
BETA	0.0446	0.0437	0.0487	0.0449
	(3.67)	(3.81)	(3.78)	(4.31)
EARLY	0.0125	0.0071	-0.0046	-0.0110
	(0.80)	(0.95)	(-0.19)	(-0.93)
D	-0.0465	-0.0392	-0.0518	-0.0391
	(-4.90)	(-3.80)	(-5.03)	(-3.16)
SDRM*D	0.1826	0.1531	0.0821	0.1243
	(2.87)	(2.01)	(1.24)	(1.60)
BETA*D	0.0182	0.0141	0.0135	0.0111
	(1.67)	(1.44)	(1.44)	(1.42)
EARLY*D	-0.0048	-0.0228	0.0073	-0.0144
	(-0.53)	(-1.72)	(0.62)	(-1.25)
DISCLOSURE	-0.0008			
	(-0.38)			
CORRUPT	0.0053			
	(0.47)			
Observations	27058	27914	27914	27914
R^2	0.1029	0.1930	0.1515	0.1960

across the entire sample, is negative and highly significant in specification (1), and insignificant across (2)-(3). $BETA * D$ is now positive and significant, suggesting that $BETA$ is higher in the 3 month post IFRS period. Finally, early adopters experience greater volatility in specification (1) only. Tables 4.6 and 4.7, which substitute the Scholes and Williams (1977) adjusted beta, $BETASW$, are quantitatively similar to Tables 4.4 and 4.5, with the exception that $EARLY * D$ in the 3 month regression, is now insignificant.

Results of the probit model required for self selection correction are presented in 4.8. The EPS variable is positive and significant, indicating that better performing firms seem to exhibit a greater probability of early adoption. Further, the percentage of foreign sales, $FSALES$, is also positive and significant. As a proxy for *international dependence*, the notion that firms with greater reliance on foreign sales adopt the IFRS early, is not surprising. The negative and significant result on $ANALYSTS$ suggests that firms with greater analyst coverage, may indeed be highly visible and transparent, and see no benefit of early adoption. Finally the positive and significant result on $DISCLOSURE$, while potentially at odds with the information environment argument for $ANALYSTS$, is potentially due to less reluctance of firms within countries affording greater disclosure already, to early adopt into the IFRS, likely due to the relatively low cost of doing so.

Tables 4.9 and 4.10 present the self-selection corrected results across 8 specifications, examining 10 and 3 months either side of the IFRS report date repsectively. Specifications (1)-(4) are identical to those previously, except

Table 4.5 – Results: 3-months pre-post earnings announcement regression

Results of estimating the following regression model:

$$\begin{aligned} SDR_{it} &= \alpha_0 + \alpha_1 SDR_{mt} + \alpha_2 Beta_i + \alpha_3 D_{it} + \alpha_4 SDR_{mt} * D_{it} \\ &+\alpha_5 Beta_i * D_t + \alpha_6 DISCLOSE_i + \alpha_7 CORRUPT_i + \epsilon_i \end{aligned}$$

SDR_{it} is the volatility of of firm i, calculated as the backwards standard deviation over the prior 20 trading days, SDR_{mt} is the volatility of the market of firm i, calculated over the prior 20 trading days, $Beta_i$ is a separate pre and post IFRS β for firm i, calculated using the market model over the 250 trading prior to, and post the first IFRS announcement day, and D is a dummy variable assuming a value of 0 in the pre IFRS period, and 1 in the post period. $DISCLOSURE$ is a country level disclosure score as per CIFAR (1995), and $CORRUPT$ is a corruption index score as used by La Porta et al. (1998). Specification (1) controls for country differences through the inclusion of $DISCLOSURE$ and $CORRUPT$, while (2)-(4) are country, year, and country-year fixed effects models respectively. T-statistics are reported below the coefficient estimates in parentheses, and are corrected for heteroscedasticity and autocorrelation in the residuals.

Variable	(1)	(2)	(3)	(4)
INTERCEPT	0.1614	0.1595	0.1800	0.1519
	(1.71)	(7.71)	(4.71)	(6.20)
SDRM	0.5922	0.6722	0.8134	0.6478
	(4.85)	(4.78)	(4.91)	(5.37)
BETA	0.0481	0.0533	0.0525	0.0551
	(4.35)	(4.35)	(3.48)	(4.15)
EARLY	0.0164	0.0239	-0.0035	0.0064
	(1.31)	(2.52)	(-0.08)	(0.34)
D	-0.2533	-0.0381	-0.0299	-0.0354
	(-8.29)	(-1.31)	(-1.03)	(-1.18)
SDRM*D	0.1826	0.1013	-0.0228	0.1070
	(1.08)	(0.51)	(-0.13)	(0.59)
BETA*D	0.0304	0.0428	0.0425	0.0389
	(1.96)	(2.90)	(2.59)	(2.47)
EARLY*D	0.6331	-0.0174	-0.0044	-0.0286
	(13.52)	(-1.01)	(-0.34)	(-1.80)
DISCLOSURE	-0.0001			
	(-0.08)			
CORRUPT	0.0059			
	(0.61)			
Observations	10187	10509	10509	10509
R^2	0.2811	0.2291	0.1782	0.2339

Table 4.6 – Results: 10-months pre-post earnings announcement regression (Scholes and Williams (1977) Betas)

Results of estimating the following regression model:

$$SDR_{it} = \alpha_0 + \alpha_1 SDR_{mt} + \alpha_2 Beta_i + \alpha_3 D_{it} + \alpha_4 SDR_{mt} * D_{it}$$
$$+\alpha_5 Beta_i * D_t + \alpha_6 DISCLOSE_i + \alpha_7 CORRUPT_i + \epsilon_i$$

SDR_{it} is the volatility of of firm i, calculated as the backwards standard deviation over the prior 20 trading days, SDR_{mt} is the volatility of the market of firm i, calculated over the prior 20 trading days, $Beta_i$ is a separate pre and post IFRS β for firm i, calculated using the market model over the 250 trading prior to, and post the first IFRS announcement day, and D is a dummy variable assuming a value of 0 in the pre IFRS period, and 1 in the post period. $DISCLOSURE$ is a country level disclosure score as per CIFAR (1995), and $CORRUPT$ is a corruption index score as used by La Porta et al. (1998). Specification (1) controls for country differences through the inclusion of $DISCLOSURE$ and $CORRUPT$, while (2)-(4) are country, year, and country-year fixed effects models respectively. T-statistics are reported below the coefficient estimates in parentheses, and are corrected for heteroscedasticity and autocorrelation in the residuals.

Variable	(1)	(2)	(3)	(4)
INTERCEPT	0.2046	0.1235	0.1861	0.1201
	(1.37)	(18.93)	(10.62)	(10.75)
SDRM	0.7175	0.6806	0.7852	0.6711
	(10.34)	(18.64)	(11.80)	(14.64)
BETASW	0.0496	0.0507	0.0528	0.0513
	(4.22)	(4.74)	(5.21)	(4.93)
EARLY	0.0134	0.0088	-0.0041	-0.0109
	(0.81)	(1.21)	(-0.17)	(-0.88)
D	-0.0346	-0.0324	-0.0394	-0.0332
	(-6.24)	(-3.99)	(-4.48)	(-3.49)
SDRM*D	0.1917	0.1657	0.0923	0.1353
	(2.84)	(2.11)	(1.35)	(1.67)
BETASW*D	0.0027	0.0051	-0.0004	0.0039
	(0.41)	(0.87)	(-0.06)	(0.78)
EARLY*D	-0.0102	-0.0265	0.0026	-0.0174
	(-1.07)	(-1.90)	(0.19)	(-1.44)
DISCLOSURE	-0.0010			
	(-0.47)			
CORRUPT	0.0053			
	(0.46)			
Observations	27058	27914	27914	27914
R^2	0.1039	0.1969	0.1525	0.2002

Table 4.7 – Results: 3-months pre-post earnings announcement regression (Scholes and Williams (1977) Betas)

Results of estimating the following regression model:

$$SDR_{it} = \alpha_0 + \alpha_1 SDR_{mt} + \alpha_2 Beta_i + \alpha_3 D_{it} + \alpha_4 SDR_{mt} * D_{it}$$
$$+\alpha_5 Beta_i * D_t + \alpha_6 DISCLOSE_i + \alpha_7 CORRUPT_i + \epsilon_i$$

SDR_{it} is the volatility of of firm i, calculated as the backwards standard deviation over the prior 20 trading days, SDR_{mt} is the volatility of the market of firm i, calculated over the prior 20 trading days, $Beta_i$ is a separate pre and post IFRS β for firm i, calculated using the market model over the 250 trading prior to, and post the first IFRS announcement day, and D is a dummy variable assuming a value of 0 in the pre IFRS period, and 1 in the post period. $DISCLOSURE$ is a country level disclosure score as per CIFAR (1995), and $CORRUPT$ is a corruption index score as used by La Porta et al. (1998). Specification (1) controls for country differences through the inclusion of $DISCLOSURE$ and $CORRUPT$, while (2)-(4) are country, year, and country-year fixed effects models respectively. T-statistics are reported below the coefficient estimates in parentheses, and are corrected for heteroscedasticity and autocorrelation in the residuals.

Variable	(1)	(2)	(3)	(4)
INTERCEPT	0.1372	0.1506	0.1622	0.1381
	(0.82)	(8.67)	(4.56)	(6.13)
SDRM	0.5205	0.6561	0.8174	0.6287
	(4.65)	(4.73)	(4.92)	(5.22)
BETASW	0.0599	0.0611	0.0617	0.0622
	(5.50)	(5.80)	(5.61)	(5.79)
EARLY	0.0383	0.0250	-0.0051	0.0044
	(2.01)	(2.77)	(-0.13)	(0.24)
D	-0.0586	-0.0338	-0.0215	-0.0312
	(-3.93)	(-1.30)	(-0.85)	(-1.18)
SDRM*D	0.3339	0.1308	0.0031	0.1328
	(2.65)	(0.65)	(0.02)	(0.70)
BETASW*D	0.0310	0.0320	0.0266	0.0296
	(3.95)	(4.67)	(3.06)	(3.74)
EARLY*D	-0.0062	-0.0224	-0.0081	-0.0323
	(-0.70)	(-1.17)	(-0.52)	(-1.83)
DISCLOSURE	-0.0003			
	(-0.13)			
CORRUPT	0.0097			
	(0.69)			
Observations	10187	10509	10509	10509
R^2	0.1235	0.2348	0.1822	0.2399

Table 4.8 – Results: Probit model of determinants of early adoption

Results of estimating the following probit model:

$$\begin{aligned} C_i &= \beta_0 + \beta_1 LNSIZE_{it} + \beta_2 EPS_{it} + \beta_3 FSALES_{it} + \beta_4 LISTINGS_{it} \\ &\quad + \beta_5 NUMEST_{it} + \beta_6 DISCLOSE_i + \beta_7 CORRUPT_i + \epsilon_{it} \end{aligned}$$

C is a dichotomous variable assuming a value of 1 if the firm is an early adopter, and 0 if the firm adopts at the official country level adoption date, $LNSIZE$ is the log of market capitalisation, EPS is earnings per share scaled by price, $FSALES$ is the level of foreign sales as a percentage of total sales, $ANALYSTS$ is the number of analysts following the firm, $LISTINGS$ is the number of foreign exchange listings, $DISCLOSURE$ is a country level disclosure score as per CIFAR (1995), and $CORRUPT$ is a corruption index score as used by La Porta et al. (1998). T-statistics are reported below the coefficient estimates in parentheses, and are corrected for heteroscedasticity and autocorrelation in the residuals, with standards errors clustered by country and firm.

Variable	
INTERCEPT	-2.2064
	(-1.92)
LNSIZE	-0.0504
	(-1.48)
EPS	0.1736
	(3.11)
FSALES	0.0050
	(5.37)
ANALYSTS	-0.0533
	(-5.14)
LISTINGS	0.0227
	(0.39)
DISCLOSURE	0.0392
	(3.03)
CORRUPT	0.0906
	(0.55)
Observations	2167
R-Square	0.1526
Max-rescaled	0.2203

the sample here, by its nature, includes only early adopters. Specifications (5)-(8) includes Heckman's Lambda. Table 4.9 indicates that $SDRM$ and $BETA$ are positive and significant as predicted. D is insignificant across all specifications. $BETA * D$, is negative and insignificant, providing evidence that IFRS adoption reduces $BETA$ over the long term.[5]

Table 4.10 reveals positive and significant coefficients on $SDRM$ and $BETA$, with the exception of $SDRM$ in (3) and (7). D is now insignificant across all specifications. Private information associated with early adoption, is only evidenced in (6) and (8), where the coefficients are negative and significant.

4.6 Conclusion

This chapter tests whether the switch to the IFRS are associated with a reduction in stock return volatility following the first IFRS report date. As prior evidence is mixed regarding the directional association between disclosure and volatility, it is postulated here that the association should be tested in a short-run and a long-run context, reflecting existing evidence that transient investors trade aggressively on the release of new information, which should stabilise over time. Further, theoretical work suggests that volatility is a reflection of information asymmetry, or at least information opaqueness. Given the involvement of transient investors in the short term, the effect

[5]Scholes and Williams (1977) $BETA$ tests provide near identical results, and for this reason, are untabulated here.

Table 4.9 – Results: Early adopters relative to matched official adopters - 10 months pre and post

Results of estimating the following regression model:

$$SdR_{it} = \alpha_0 + \alpha_1 SdR_{mt} + \alpha_2 Beta_i + \alpha_3 D_{it} + \alpha_4 SdR_{mt} * D_{it} + \alpha_5 BETA_i * D_t$$
$$+\alpha_6 SIZE_{it} + \alpha_7 DISCLOSE_i + \alpha_8 CORRUPT_i + \alpha_9 LAMBDA_i + \epsilon_i$$

SdR_{it} is the volatility of of firm i, calculated as the backwards standard deviation over the prior 20 trading days, SdR_{mt} is the volatility of the market of firm i, calculated over the prior 20 trading days, $Beta_i$ is a separate pre and post IFRS β for firm i, calculated using the market model over the 250 trading prior to, and post the first IFRS announcement day, and D is a dummy variable assuming a value of 0 in the pre IFRS period, and 1 in the post period. $DISCLOSURE$ is a country level disclosure score as per CIFAR (1995), and $CORRUPT$ is a corruption index score as used by La Porta et al. (1998)and $LAMBDA$ is Heckman's Lambda. Specifications (1) and (5) control for country differences through the inclusion of $DISCLOSURE$ and $CORRUPT$, while (2)-(4) and (6)-(8) are country, year, and country-year fixed effects models respectively. T-statistics are reported below the coefficient estimates in parentheses, and are corrected for heteroscedasticity and autocorrelation in the residuals, with standards errors clustered by country and firm.

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
INTERCEPT	0.2048	0.0435	0.1170	-0.0660	0.2460	0.0605	0.0605	-0.0409
	(1.60)	(1.60)	(3.91)	(-2.04)	(2.05)	(1.36)	(1.36)	(-0.74)
SDRM	0.8103	0.8489	0.6807	0.7678	0.8282	0.8585	0.8585	0.7685
	(12.44)	(10.10)	(5.32)	(5.59)	(12.50)	(11.16)	(11.16)	(5.77)
BETA	0.1051	0.1030	0.1422	0.1463	0.1172	0.1123	0.1123	0.1551
	(3.13)	(3.07)	(5.16)	(7.19)	(2.08)	(1.96)	(1.96)	(6.14)
D	0.0232	-0.0018	0.0594	0.0368	0.0202	-0.0032	-0.0032	0.0362
	(0.54)	(-0.04)	(1.08)	(0.64)	(0.51)	(-0.08)	(-0.08)	(0.65)
SDRM*D	0.0610	0.1147	0.1119	0.1269	0.0843	0.1308	0.1308	0.1234
	(0.18)	(0.34)	(0.31)	(0.35)	(0.28)	(0.44)	(0.44)	(0.35)
BETA*D	-0.0631	-0.0331	-0.1352	-0.1030	-0.0636	-0.0347	-0.0347	-0.1018
	(-2.53)	(-2.33)	(-3.30)	(-2.74)	(-2.46)	(-2.08)	(-2.08)	(-2.40)
DISCLOSURE	-0.0027				-0.0030			
	(-1.56)				(-1.81)			
CORRUPT	0.0086				0.0073			
	(0.50)				(0.47)			
LAMBDA					-0.0279	-0.0217	-0.0217	-0.0461
					(-0.58)	(-0.42)	(-0.42)	(-1.02)
Observations	600	600	600	600	600	600	600	600
R^2	0.3186	0.3328	0.3674	0.3951	0.3225	0.3351	0.3351	0.4014

Table 4.10 – Results: Early adopters relative to matched official adopters - 3 months pre and post

Results of estimating the following regression model:

$$SdR_{it} = \alpha_0 + \alpha_1 SdR_{mt} + \alpha_2 Beta_i + \alpha_3 D_{it} + \alpha_4 SdR_{mt} * D_{it} + \alpha_5 BETA_i * D_t + \alpha_6 SIZE_{it} + \alpha_7 DISCLOSE_i + \alpha_8 CORRUPT_i + \alpha_9 LAMBDA_i + \epsilon_i$$

SdR_{it} is the volatility of of firm i, calculated as the backwards standard deviation over the prior 20 trading days, SdR_{mt} is the volatility of the market of firm i, calculated over the prior 20 trading days, $Beta_i$ is a separate pre and post IFRS β for firm i, calculated using the market model over the 250 trading prior to, and post the first IFRS announcement day, and D is a dummy variable assuming a value of 0 in the pre IFRS period, and 1 in the post period. $DISCLOSURE$ is a country level disclosure score as per CIFAR (1995), and $CORRUPT$ is a corruption index score as used by La Porta et al. (1998)and $LAMBDA$ is Heckman's Lambda. Specifications (1) and (5) control for country differences through the inclusion of $DISCLOSURE$ and $CORRUPT$, while (2)-(4) and (6)-(8) are country, year, and country-year fixed effects models respectively. T-statistics are reported below the coefficient estimates in parentheses, and are corrected for heteroscedasticity and autocorrelation in the residuals, with standard errors clustered by country and firm.

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
INTERCEPT	0.7292	0.0734	0.2104	-0.0261	0.7693	0.1110	0.2371	0.0048
	(2.17)	(1.50)	(2.82)	(-0.34)	(2.05)	(2.88)	(3.93)	(0.06)
SDRM	0.5397	0.5250	0.2109	0.3480	0.5379	0.5245	0.2000	0.3486
	(4.67)	(4.91)	(1.18)	(2.60)	(4.65)	(4.98)	(1.14)	(2.76)
BETA	0.1372	0.1237	0.1463	0.1311	0.1431	0.1331	0.1511	0.1392
	(9.62)	(5.28)	(8.24)	(5.88)	(6.73)	(4.49)	(7.07)	(5.44)
D	-0.0326	-0.0506	0.0142	-0.0039	-0.0346	-0.0542	0.0122	-0.0069
	(-0.84)	(-1.07)	(0.29)	(-0.07)	(-0.99)	(-1.25)	(0.26)	(-0.13)
SDRM*D	0.5189	0.5150	0.2952	0.2949	0.5291	0.5302	0.3038	0.3054
	(2.19)	(2.15)	(0.81)	(0.78)	(2.40)	(2.37)	(0.87)	(0.85)
BETA*D	-0.0343	-0.0018	-0.0523	-0.0177	-0.0341	-0.0004	-0.0512	-0.0152
	(-1.04)	(-0.07)	(-1.15)	(-0.47)	(-0.98)	(-0.01)	(-1.03)	(-0.35)
DISCLOSURE	-0.0061				-0.0066			
	(-1.60)				(-1.68)			
CORRUPT	-0.0205				-0.0184			
	(-0.37)				(-0.33)			
LAMBDA					-0.0195	-0.0318	-0.0185	-0.0317
					(-0.85)	(-2.09)	(-1.30)	(-3.43)
Observations	414	414	414	414	414	414	414	414
R^2	0.2020	0.2607	0.3130	0.3548	0.2041	0.2663	0.3147	0.3595

of greater transparency, should result in a decrease in volatility in the long term.

Results reveal that across the entire sample of adopters, the null of no decrease in stock volatility in the 10 months following adoption, is rejected. Short term tests are less convincing, with all but one specification failing to reject the null. This provides some evidence that the behaviour of stock volatility following this information event differs, between the short and long term. Furthermore, $BETA$ is significantly positive in the post-IFRS period in 3-month post tests. Hence, although raw volatility is insignificantly different in the post IFRS period in such tests, the positive and significant coefficient on the $BETA$ slope dummy suggests that relative to the market, volatility is in fact, greater.

The association between information and stock return volatility poses a number of interesting research opportunities. For one, future research could further disentangle the short and long run properties of stock volatility, and its association with earnings releases, examining the effect of good vs bad news. The IFRS has only provided one information event. Indeed, future research may entail examining the effect of regulatory changes on volatility, or the interested researcher may also opt to apply a GARCH model to test the robustness of the results herein.

Chapter 5

Conclusion

This dissertation tests the contention that the IFRS promote transparency, through three relevant factors; the adverse selection component of the bid-ask spread, the cost of equity, and stock return volatility. Each of these is addressed as a separate chapter, which together seek to provide evidence on the hypothesised effect on transparency.

The first essay, presented in Chapter 2, tests whether IFRS adoption is associated with a reduction in the adverse selection component of the bid-ask spread. The chapter begins by elaborating on a model by Bollen et al. (2004), which isolates the separate components of the bid-ask spread; order processing cost, inventory holding cost, and adverse selection cost. The adverse selection measure captures the extent to which the market maker hedges against the probability of an adverse price movement until the position is reversed out, and the risk of encountering an informed trader. If the IFRS succeed in improving transparency, consistent with prior literature, then the second point; the risk of encountering an informed trader, is reduced.

Using a model due to Bollen et al. (2004) and adopting the approach taken by Sidhu et al. (2008), a dummy variable is added which assumes a value of 1 in the post-IFRS period, and 0 otherwise. Further, given that firms may early adopt into the regime, additional models are tested which isolate early adopters, and control for self-selection bias.

The sample includes 13,610 firm-month observations, covering 20 countries. Contrary to prior literature (e.g. Welker (1995)), results suggest that the bid-ask spread actually *increased* following adoption. The coefficient on the slope dummy, which interacts the IHP with the pre-post dummy variable however, provides evidence that despite the result on the bid-ask spread, the adverse selection component significantly *decreased.* This is an interesting result, which not only provides weight to the Bollen et al. (2004) model, but illustrates the bluntness of the bid-ask spread as a variable intent on capturing adverse selection, as has been done in the past.

The second essay, which is presented in Chapter 3, addresses whether the IFRS are associated with a reduction in the cost of equity. The chapter utilises a *ex ante* cost of equity metric due to Pastor et al. (2008), and a measure by Easton (2004) for robustness. Further tests are conducted which isolate early adopters, and control for self-selection inherent in the choice to voluntarily opt into this regime. In these tests, an *abnormal ex ante cost of equity* measure is substituted as the dependent variable, and is measured as the cost of equity according to each of the above measures, *less* the mean cost of equity of a comparison control group of firms.

The sample for Chapter 3 consists of 2,700 firm month observations, and covers 17 countries. While some evidence is revealed that the cost of equity is reduced by IFRS adoption alone, these results are not consistent across all specifications. However, the *abnormal cost of equity*, measured as the difference between the cost of equity of the sample firm, less the mean of a comparison group, is lower in the post IFRS period for early adopting firms with greater analyst following than before adoption. Interestingly, across both early and official adoptors, this same variable is positive and only weakly significant. Hence, it is possible that early adoption has its merits, particularly for firms exhibiting greater visibility afforded by higher analyst following.

Finally, Chapter 4 examines the association between IFRS adoption and stock return volatility, over the short and long-term. A simple model of cross sectional stock return volatility is developed, using the intuition behind the Capital Asset Pricing Model, and the approach taken follows that of the preceding two essays.

The sample for Chapter 4 consists of 28,540 firm-month observations for 10-month pre-post tests, and this sample spans 22 countries. Tests reject the null of no decrease in stock volatility following IFRS adoption, but for the longer term tests only. Estimation of identical models with a sample of 3-months pre-post IFRS fail to reject the null. This adds an interesting contribution to the extant literature. Bushee and Noe (2000) for example, identify that the involvement of aggressive, transient investors contribute to an increase in stock volatility following earnings releases, despite theory suggesting a contrary result. Indeed, both are possibly the case. The result within

Chapter 4 suggesting that stock volatility decreases over the 10-months following IFRS adoption, compared to the 10-months prior. Indeed, failure to reject the null in short-term tests, suggests the possibility of aggressive trading in the short-run, particularly given the greater transparency widely believed to emanate from IFRS adoption.

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