Asia-Pacific Financial Markets
https://doi.org/10.1007/s10690-021-09344-6

ORIGINAL RESEARCH

Liquidity and Volatility of Stocks Moved from the Main Market to the Alternative Investment Market (AIM)

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Accepted: 10 June 2021

Abstract

Companies moving from the Main market of London Stock Exchange to the AIM impair their information environment when entering the AIM; the information environment is measured by the stock's liquidity and volatility. The primary empirical finding is that movement from the Main Market to the AIM decreases the liquidity and volatility of stocks. After controlling for the effects of factors that are known to affect stock liquidity and for the change in company characteristics after the movement date in the multivariate analysis, it is found that moving to the AIM is associated with a significant increase in Amihud illiquidity and the bid–ask spread and with a decrease in stock return volatility. The documented effects of movement to the AIM are found to be sustained over a long period of time following the movement event. This therefore implies that moving from the Main Market to the AIM is not improving the companies' liquidity and volatility.

Keywords Alternative investment market (AIM) · Heckman two stage model · Liquidity · Multivariate analysis · Two-stage least squares (2SLS) · Volatility

1 Introduction

Firms generally present on a stock exchange to enhance their access to capital, prominence, reputation and liquidity (Bancel & Mittoo, 2009; Mansaku et. al., 2017), with the critical objective of increasing the value of their stocks (Chouinard & D'Souza, 2004; Mortazian et al., 2019). Joining reputable markets involves meeting strict requirements; therefore, markets such as the NASDAQ and the Alternative Investment Market (AIM) have been designed to provide accessibility to capital involving fewer regulations and costs than markets for example, the New York Stock Exchange (NYSE) and the Main Market of the London Stock Exchange (LSE). Gradually, most of the companies listed on the NASDAQ and AIM will become

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Published online: 10 July 2021

eligible to move to the NYSE and the Main Market after they have achieved growth (Dang et al., 2018; Mortazian et al., 2019). This movement enables them to fulfil better the aim of lowering their cost of capital, increasing their visibility and prestige and hence gaining more market value (Kedia & Panchapagesan, 2011). The improvement in stock liquidity originates from the improvement in the information environment (Dabhane, 2018). Hence, a reduction of information asymmetry decreases the adverse selection factor of trading expenditures, resulting in improved liquidity and reduced transaction costs, especially the bid–ask spread (Dabhane, 2018; Glosten & Harris, 1988; Kyle, 1985; Rodrigues & Galdi, 2017). Therefore, the cost of capital decreases (Baiman & Verrecchia, 1996; Diamond & Verrechia, 1991; Gomes et al., 2019) and the firm value increases (Fang et al., 2009).

However, Campbell and Tabner (2011) show that the transactions between the AIM and the Main Market of the LSE include more companies that move from the Main Market to the AIM than conversely. They explain that more than twice as many firms move from the Main Market to the AIM as move in the reverse direction.

However, the literature shows that the impact of a change in the information environment on stocks' performances is sensitive to the proxy chosen, as the information environment itself is not simply quantifiable and empirically testable. Studies such as Leuz and Verrecchia (2000) and Blasco and Corredor (2017) state that stock liquidity and volatility are appropriate proxies when testing the quality of firms' information environment. They also reveal that the increase in stock liquidity and the decrease in stock volatility following cross listing to a more restricted market can be explained by the reduction in information asymmetry.

The existing literature concerning the change in stock liquidity and volatility resulting from companies' migration between markets is mixed. Some studies show that in markets with higher disclosure requirements, the trading costs are lower (Aouadi et al., 2018; Domowitz et al., 1998; Hamet, 2002; Hombach & Sellhorn, 2018; Tse & Devos, 2004) and the trading volume is higher (Babus & Kondor, 2018; De Carvalho & Pennacchi, 2012; Hamet, 2002; Tse & Devos, 2004). Other studies show that there is no relationship between moving to another market with a different information level and trading expenditures (Noronha et al., 1996; Silva & Chávez, 2008) or amount of trading volume (Berkman & Nguyen, 2010; Domowitz et al., 1998). The literature relating to the volatility change between markets with different disclosure levels shows no significant change in volatility between the two types of market (Ang et al., 2013; Chipunza, & McCullough, 2018; Howe & Madura, 1990; Howe et al., 1993) or maximization in volatility in the higher-tier market because of the increase in trading activity (Bartram et al., 2012; Menkveld, 2008). Overall, the existing evidence regarding liquidity and volatility changes when firms move to another market with a different disclosure level is not conclusive.

This study underwrites to the literature by investigating the effect of shifting from the Main Market to the AIM on stocks' liquidity and volatility. More in detail, the key research question is: are companies that move from the Main Market to the AIM expected to have lower liquidity and higher volatility than companies that stay in the Main Market because migrations from the Main Market to the AIM deteriorate the stock information environment?

In this study Sect. 2 debates the relevant literatures. Section 3 discusses about the data and methodology. Section 4 describes the empirical findings and finally Sect. 5 concludes the article.

2 Literature Review

2.1 Liquidity

Different studies examine the liquidity change after cross listing or moving from a lower-tier market to a higher-tier market by considering the change in trading volume and/or trading costs and find greater liquidity for these companies and conclude that liquidity, visibility and greater investor recognition are among the main reasons for moving to a market with more regulation. (Baker et al., 1999; Dodd & Gilbert, 2016; Huang et al., 2013; Jain & Kim, 2006; Papaioannou et al., 2009; Tandon & Webb, 2001). However, despite all the illustrations mentioned about improving liquidity by moving to a more regulated market, there is some literature that shows that moving to a more regulated market may not always enhance liquidity (Amihud & Mendelson, 1986; Kryzanowski & Lazrak, 2009; Reinganum, 1990; Silva & Chávez, 2008).

By deciding to move from the Main Market to the AIM market of the LSE, companies face lower entry requirements and are able to release less information, which is the first source that explains stocks' liquidity is expected to deteriorate after moving from the Main market to the AIM. Also, as stock liquidity is introduced as the capability to trade large quantities of the stock at a low cost, the two core scopes of liquidity are trading size and trading cost. Amihud illiquidity represents the trading activity dimension of liquidity and the bid–ask spread represents the trading cost dimension of liquidity. Therefore, it can be determined that a higher level of Amihud illiquidity and bid–ask spread would imply lower stock liquidity. Theoretically, Amihud (2002) and Lesmond (2005) illustrate the negative relationship of Amihud and trading activity, while Glosten and Milgrom (1985) and Kyle (1985) describe a positive relationship between the bid–ask spread and the level of information asymmetry. Wide-ranging empirical evidence approves that improved admission is associated with improved liquidity in terms of extents, trading sizes, depth and the adverse selection spread component (Healy et al., 1999; Heflin & Shaw, 2000; Krishnamurti et al, 2005; Leuz & Verrecchia, 2000; Welker, 1995).

The second source that explains the reduction in liquidity after moving to a less regulated market is the relationship between trading volume and information asymmetry. Studies such as Kyle (1985) and Noronha et al (1996) and more recent studies such as Collin-Dufresne and Fos (2016) all illustrate that information arrival maximize the trading size and empirically approve the increase in informed trading after cross listing. Thus, it can be concluded that deterioration in the information environment can be a result of the decrease in the number of market contestants who have the motivation to generate stock-specific information to profit from informed trading.

Furthermore, Stoll (1978, 2001) and Amihud and Mendelson (1995) show hypothetically that enhanced competition forces market makers to decrease the spread. Therefore, the third source of the reduction in liquidity creates from the lower level of inter-market competition in the AIM than in the Main Market. Finally, as Merton (1987) mentions, a more liquid trading environment after listing in a more regulated market could be likely as a result of increased stock visibility and investor acknowledgment, and a less liquid trading environment after moving from the Main Market to the AIM could be likely as a result of reduced stock visibility and investor acknowledgment. Therefore, the first hypothesis is:

H1 Moving from the Main Market to the AIM reduces the liquidity of a stock.

2.2 Volatility

A group of studies suggests that higher information quality signals lower market risk and hence lower volatility (Barry & Brown, 1986; Brockman & Yan, 2009; Lambert et al., 2007; Wang, 1993). Another group of studies mentions that the higher trading volume results in higher volatility (Chan & Fong, 2000; Hatrick, et al., 2011; Jones et al., 1994; Kim et al., 2005) therefore, the lower trading volume that is evident after moving to a less regulated market should be associated with lower volatility. A lower trading volume after movement is expected to be due to the decrease in the number of investors after moving to a lower-tier market and the smaller quantity of information that is released to the market. Less information results in less trading, potentially because of diverse clarifications of public data by investors (Bamber et al., 1999). Thus, academic forecasts on the effect of shifting from a high-regulation market to a low-regulation market on stock risk are unclear and need support with empirical evidence.

Studies such as Barclay et al. (1990), Eleswarapu and Venkataraman (2006) that employ daily data explain that stock return volatility increases after appearing in a more regulated market because the trading volume is greater in the destination market. Foucault and Frésard (2012) argue that a cross-listing to a more regulated market, enhance investors' reliance on stock prices as it makes them more informative to them, which result to lower volatility.

The second group of studies uses intraday data to analyse the change in volatility after listing to another market. Chan et al. (1996) explain that stocks that cross list from different countries to the US face greater volatility and more trading activities than US stocks that cross list to other markets; they illustrate that this change is more significant in early mornings. They also mention the market response to public information gathered in the foreign markets overnight as one of the possible explanations for this change. Lowengrub and Melvin (2002) explain that the intradaily volatility is generally described by a U-shape, which shows that the volatility is high near the morning opening and near the afternoon closing. However, different studies propose that the intraday model of information asymmetry is neither U-shaped nor the reverse. Garvey and Wu (2009) mention that the execution speed and execution cost determine intraday time-dependent models and that these models originate

from changes in the level of informed trading. Heston et al. (2010) show that volume, order imbalance, volatility, bid–ask spreads and stock returns play a role in particular patterns at half-hour intervals that are exact multiples of a trading day.

Overall, the empirical evidence on the impact of moving from a less regulated market to a more regulated market or cross listing on stock return volatility is mixed. However, there is a mutual component in most of the empirical evidence: the change in volatility after cross listing is positively in relation to the change in trading volume after cross listing.

A smaller amount of information released by companies results in greater information asymmetry, which is a source of risk and higher volatility. As mentioned by different literature, such as Brockman and Yan (2009), the higher volatility is due to the higher level of uncertainty about the stock's future cash flows. In addition, Lang and Lundholm (1993) believe that the higher volatility that results from greater information asymmetry could be a consequence of the stock price reaction to new information. Moreover, studies such as De Long et al. (1990), Campbell and Kyle (1993) Kim et al. (2005) and Hatrick et al. (2011) introduce noise trading as another reason for greater stock volatility when the information asymmetry increases. These studies explain that when active noise trading increases, the stock price informativeness decreases, resulting in increased uncertainty about the stock fundamentals for uninformed traders and subsequently increased risk. Hence, since moving from the Main Market to the AIM is associated with a lower level of information disclosure due to lower listing requirements, it should increase the stock risk and stock return volatility. Therefore, the second hypothesis is:

H2 Stock movement from the Main Market to the AIM increases the stock return volatility.

3 Methodology

In order to analyse the impact of moving from the Main Market to the AIM on stocks' liquidity and volatility, cross-sectional analysis, evolution of stock liquidity and volatility and time-series framework are applied.

3.1 Cross-Sectional Analysis

In the cross-sectional analysis, the liquidity and volatility of companies that moved from the Main Market to the AIM are compared with those of companies that remained in the Main Market. The deterioration in liquidity and volatility after movement from the Main Market to the AIM are potentially not a direct outcome of movement, but rather the replication of the fact that stocks with lower liquidity and higher volatility are more likely to move from the Main Market to the AIM. Therefore, there is a potential endogeneity problem in the valuation of the relationship between moving from the Main Market to the AIM and stock liquidity and volatility. Doidge et al. (2004) highlight, it is crucial to control for the self-selection bias in the

regression analysis. Doidge et al. (2004) and Fernandes and Ferreira (2008) both use Heckman's (1979) two-stage estimation and two-stage least squares (2SLS)[1] models, which are used in this study to govern for possible endogeneity.

The first stage of the Heckman estimation tests the likelihood of movement from the Main Market to the AIM by considering the companies' characteristics.

$$\text{Probability}\left(\text{MS}_{i,t}\right) = f\left(\omega M_{i,t}\right) \tag{1}$$

where Probability is the likelihood of stocks' movement from the Main Market to the AIM, $M_{i,t}$ is the movement dummy variable that equals one if stock i is moved from the Main Market to the AIM in month t and zero otherwise; $M_{i,t}$ are the possible causes of movement status. Thus as shown in Eq. (1), probability of movement from Main to AIM is a function (f) of companies' characteristics.

The company characteristics considered in the probit model can have an impact on stocks' information environment and, therefore, on stock liquidity and volatility. The first factor considered in this study is company size, which is measured by stock market capitalization. To calculate liquidity and volatility and the regression analysis, the monthly stock market capitalization (stock market capitalization at the end of the month) is used. The second factor that is considered to have an impact on the information environment is international accounting standards (IAS), which is the dummy variable that represents the acceptance of IAS accounting practices. The IAS variable changes over time and shows whether any changes have been applied to the company's accounting standards. The last variable that exerts an impact on stocks' liquidity and volatility by affecting the information environment after a move from the Main Market to the AIM is the level of trading activity, and this is measured by the stock's total trading volume.

Moreover, many different studies, such those by as Roll (1984), Atkins and Dyl (1997), Glosten and Harris (1988), Stoll (2001), Menyah and Paudyal (2000) and Gregoriou et al. (2005), mention that, apart from the company size, stocks' liquidity and volatility are affected by the level of trading activity. In this study, to control for this, the stock turnover ratio is included in the return volatility regressions. To control for the company risk dimension, leverage as measured by total liabilities to total assets is included in the regressions of the liquidity volatility measures. The maximum likelihood coefficient, which is produced by the probit model, is used to estimate the inverse Mills ratio.

$$\begin{aligned} &\text{for } \text{MS}_{i,t} = 1, \lambda_{i,t} = \varphi(\omega M_{i,t})/\Phi(\omega M_{i,t}) \\ &\text{for } \text{MS}_{i,t} = 0, \lambda_{i,t} = -\varphi(\omega M_{i,t})/[1 - \Phi(\omega M_{i,t})] \end{aligned} \tag{2}$$

where $M_{i,t}$ is the movement dummy variable, which equals one if stock i moves from the Main Market to the AIM in month t and zero if not; $\lambda_{i,t}$ is the opposite Mills ratio; φ is the normal probability distribution function; and Φ is the normal

[1] In addition, both Doidge et al. (2004) and Fernandes and Ferreira (2008) apply a random-effect model to compare its result with the result of models considering self-selection bias. Therefore, random-effect regression is run in this study as well.

cumulative distribution function. Therefore, Eq. 2 is to calculate the inverse Mills ratio, which is an evaluation of the non-selection hazard and is calculated to estimate the chance of a stock moving from the Main Market to the AIM.

In the second stage of the Heckman estimation, the link between the measures of liquidity and volatility and the movement status and other stock characteristics are estimated using a multivariate framework. Multivariate regression in this study includes the estimated inverse Mills ratio to consider the self-selection bias and achieve consistent parameter estimates.

Therefore, the main model specification is:

$$\text{Liquidity/Volatility Measure } i,t = \alpha + \beta D_{i,t} + \Sigma\theta M_{i,t} + \gamma\lambda_{i,t} + \varepsilon_{i,t} \quad (3)$$

where $D_{i,t}$ is a dummy variable that replicates the movement status of stock i in month t; $M_{i,t}$ are control variables; and $\lambda_{i,t}$ is the opposite Mills ratio.

Moreover, this study includes the test results of the two-stage least-squares (2SLS) model. In the two-stage least squares (2SLS) model, the same exogenous variables as in the probit model is used as instrumental variables.

3.2 Evolution of Stock Liquidity and Volatility

As previously discussed, there is an endogeneity problem concerning the possibility of movement of less liquid and riskier stocks from the Main Market to the AIM. Thus this study considers the evolution of the stock liquidity and volatility of moved stocks before and after movement[2].

For the purpose of illustrating the dynamics, the liquidity and volatility of stocks that moved from the Main Market to the AIM are calculated in each year $(-4,-3,-2,-1,+1,+2,+3,+4)$; first, they are compared with the stock liquidity and volatility in year before movement, and second, they are compared with the liquidity and volatility of stocks that stayed in the Main Market. In addition, the evolution of stock liquidity and volatility is estimated by applying a multivariate regression analysis framework. Furthermore, in the cross-sectional regression, instead of a dummy variable to show the movement status, a series of dummy variables that indicate the number of years around the movement $(-4,-3,-2,-1,+1,+2,+3,+4)$ is used in the regression. Therefore, by controlling the other factors, the coefficient estimates for each year's dummy determine the growth of stock liquidity and volatility before movement, during the year of movement and after movement.

[2] This approach is similar to that of Gozzi et al. (2008), who evaluate the change in Tobin's Q around cross listing, and Hail and Leuz (2009), who estimate the reduction in the cost of capital after cross listing.

3.3 Time-Series Framework

This study considers the 48-month period before movement as the base period for the estimation of the base variables[3]. The base measures of stock liquidity and volatility are calculated for each stock as the averages of all these measures over the time when the stock had not moved from the Main Market to the AIM. In this study, daily data are used to calculate all the liquidity and volatility measures for each month. Table 1 reviews the liquidity and volatility measures estimated in this study.

In the next step, to apply univariate analysis, the ratios of the liquidity and volatility measures along with all explanatory and control variables are calculated. Therefore, the ratios are calculated as a variable in month t to the base variable, which is the average value of the variable over the period when the stock was listed on the Main Market:

$$\left(\text{Liquidity}_{\text{it}} \text{or Volatility}_{\text{it}} / \text{ Liquidity}_{\text{bit}} \text{or Volatility}_{\text{bit}}\right) = \alpha + \omega D_{i,t} + \Sigma\theta\left(\text{EC}_{i,t}/\text{EC}_{i,\text{base}}\right) + \varepsilon_{i,t} \tag{4}$$

where $\text{Liquidity}_{\text{it}}$ or $\text{Volatility}_{\text{it}}$ is defined as the liquidity or volatility measure of stock i in month t; $\text{Liquidity}_{\text{bit}}$ or $\text{Volatility}_{\text{bit}}$ is the base liquidity or volatility measure of stock i; $D_{i,t}$ is a dummy variable that shows the movement status of stock i in month t; $EC_{i,t}$ are different stock characteristics, including the descriptive and control variables, of stock i in month t; and $EC_{i,base}$ are the base stock characteristics of stock i. By using these model specifications, it is possible to assess whether the variation in stock liquidity and volatility is affected by the variation in the movement status or by the variations in the stock characteristics after movement.

4 Findings and Results

The sample includes two groups of companies: the first group consists of companies that moved from the Main Market to the AIM; and the second group includes companies that remained listed on the Main Market. Each company in the first group is matched with one company in the second group. The matching process is similar to Errunza and Miller (2000); however, following Baker et al. (2002) the industry component is added. The differences in variable means between the two groups of companies that moved from the Main Market to the AIM (MAIN2AIM) and their matched companies that stayed in the Main Market (MATCH) are depicted in Table 2. Based on the t-test applied, it can be concluded that the mean of liquidity measures of MAIN2AIM stocks are significantly different from that of the MATCH stocks. Furthermore, Panel A of Table 2 depicts the significant difference in the volatility measures' mean between the two groups of MAIN2AIM and MATCH. As expected, the volatility ratio of the MAIN2AIM firms is significantly higher than that of the MATCH firms. In contrast, comparing the return volatility and high–low

[3] As applied by Lowengrub and Melvin (2002), controlling the liquidity and volatility of the moved stocks around their movement is another method for considering self-selection bias.

Table 1 Stock liquidity and volatility measures

Variable	Definition	Measurement
Amihud illiquidity	The sum of the ratios of the daily absolute return to price times trading volume divided by the number of days that data is available	$Amihud\ illiquidity = 1/D_q\ \Sigma^{Q}_{t=1}\ \lvert R_t\rvert/(Price_t \times Volume_t)$,where D_q is the number of days for which data are available and R_t, P_t and VO_t are the daily return, daily price and daily volume, respectively
Proportional bid-ask spread	The difference between ask and bid Main market prices to the average of the ask and bid prices (midpoint). Monthly average bid-ask spread is calculated as the average of the daily bid-ask spreads	$Bid–Ask\ Spread_{i,T} = (1/N_{i,T})\Sigma(\ P_{ask\ i,t} - P_{\text{bid}\ i,t})/((\ P_{ask\ i,t} + P_{bid\ i,t})/2)$, where $Bid–Ask\ Spread_{i,T}$ is the average bid–ask spread of stock i in month T; $N_{i,T}$ is the number of trading days for stock i in month T; $P_{ask\ i,t}$ is the ask price of stock i on day t; and $P_{bid\ i,t}$ is the bid price of stock i on day t
Total turnover ratio	The monthly average of the daily turnover ratios which are calculated as a ratio of the trading volume by value which is the result of the number of shares traded times the stock price divided by the stock's market capitalization	$TPtoMV_{i,T} = (1/N_{i,T})\Sigma(VO_{i,T}\ P_{i,T}/MV_{i,T})$, where $TPto\ MV_{i,T}$ is the average turnover ratio of stock i in month T; $N_{i,T}$ is the number of trading days for stock i in month T; $VO_{i,t}$ is the number of shares traded on the Main Market of stock i on day t; $P_{i,T}$ is the closing price of stock i on day t; and $MV_{i,t}$ is the market capitalization of stock i on day t
Return volatility	The monthly standard deviation of the stock's daily returns including dividend income	$Volatility\ Ratio_{i,T} = \sigma_{i,T}$, where $Volatility\ Ratio_{i,T}$ is the firm-to-market volatility ratio of stock i or the monthly market-adjusted volatility of stock i's daily returns in month T
Volatility ratio	The ratio of monthly standard deviation of the stock's daily total returns to the monthly standard deviation of daily total returns of the Main market	$Volatility\ Ratio_{i,T} = \sigma_{i,T}/\sigma_{M(i),T}$, where $Volatility\ Ratio_{i,T}$ is the firm-to-market volatility ratio of stock i or the monthly market-adjusted volatility of stock i's daily returns in month T; $\sigma_{i,T}$ is the monthly standard deviation of stock i's daily returns in month T; and $\sigma_{M(i),T}$, T is the monthly standard deviation of stock i's Main Market daily returns in month T
High-low ratio	The average of the daily high-low ratios which is the natural logarithm of the ratio of the highest stock price reached on the day to the lowest price attained on the day	$High–Low\ Ratio_{i,T} = (1/N_{i,T})\Sigma ln(P_{high\ i,t}/P_{low\ i,t})$, where $High–Low\ Ratio_{i,T}$ is the average of the daily high–low ratios of stock i in month T; $N_{i,T}$ is the number of trading days for stock i in month T; $P_{high\ i,t}$ is the highest price reached of stock i on day t; and $P_{low\ i,t}$ is the lowest price attained by stock i on day t

The table reports the list of stock liquidity and volatility measures and explains definition and illustrates data sources used in order to estimate each of variables.

Table 2 Summary statistics

Variable	Moving status	N observations	Mean	Mean difference from match	Min.	Max.	St. Dev.
Panel A: Dependent variables							
Amihud illiquidity	All	48,470	0.251		0.000	53.958	1.045
	MAIN2AIM	24,235	0.279	0.000***	0.000	24.634	1.074
	MATCH	24,235	0.202		0.000	53.958	1.025
Bid–ask spread	All	48,470	− 0.062		− 1.924	2	0.045
	MAIN2AIM	24,235	− 0.093	0.000***	− 1.825	0.245	0.023
	MATCH	24,235	− 0.025		− 1.924	2	0.052
Total Turnover ratio	All	48,470	0.335		0.000	61.288	0.781
	MAIN2AIM	24,235	0.297	0.000***	0.000	61.288	1.041
	MATCH	24,235	0.372		0.000	34.182	0.704
Return volatility	All	47,661	218.825		0.000	34,005.44	894.741
	MAIN2AIM	24,235	85.127	0.000***	0.000	10,012.86	10,003.120
	MATCH	23,426	324.843		0.009	34,005.44	1254.209
Volatility ratio	All	48,470	0.450		0.000	860.637	7.191
	MAIN2AIM	24,235	0.742	0.000***	0.009	860.637	9.167
	MATCH	24,235	0.652		0.000	1.598	0.315
High–low ratio	All	48,470	− 0.005		− 7.967	0.280	0.309
	MAIN2AIM	24,235	− 0.006	0.000***	− 7.967	0.280	0.421
	MATCH	24,235	0.008		0	0.105	0.012
Panel B: Firm characteristics							
Company size	All	42,822	15,119,204		50	6,002,353,806	208,457,845
	MAIN2AIM	21,411	62,845.04	0.000***	235	16,681,284.4	506,142.01
	MATCH	21,411	28,745,811		50	6,002,353,806	286,900,729

Table 2 (continued)

Variable	Moving status	N observations	Mean	Mean difference from match	Min.	Max.	St. Dev.
Leverage	All	39,004	0.412		− 0.462	65.371	1.804
	MAIN2AIM	19,502	0.523	0.000***	− 0.462	65.371	2.824
	MATCH	19,502	0.501		0.004	43.902	0.901
Total trading volume	All	48,470	1365.215		0.004	637,982.9	15,140.01
	MAIN2AIM	24,235	285.124	0.000***	0.004	95,608.02	1498.925
	MATCH	24,235	2441.543		0.006	637,982.9	21,195.41

Panel A of the table reports the summary statistics of the stock liquidity and volatility measures by different movement statuses. Panel B of the table reports the summary statistics of firms' characteristics by their moving status. All the stocks are inclusive of MAIN2AIM stocks and MATCH stocks; the number of observations (N) is the number of stock-month observations of the available data. 'Mean difference from match' is the difference between the mean of the MAIN2AIM stocks and the mean of the MATCH stocks. The statistical significance reported is based on the t-test

***Indicates significance at 1%, **indicates significance at 5% and *indicates significance at 10%

Table 3 Probit model

	Probit	
	(1)	(2)
Company size	−0.000*** (−20.14)	−0.000*** (−15.01)
Leverage	0.045*** (4.15)	0.014*** (2.00)
IAS	−0.596*** (−42.58)	−0.615*** (−25.94)
Trading volume	−0.000*** (−18.56)	−0.000*** (−16.88)
Return volatility	−0.000*** (−15.55)	
Volatility ratio	0.854*** (0.013)	
High–low ratio	−2.846*** (−7.014)	
Amihud		0.067*** (9.015)
Bid–ask spread		8.549*** (49.45)
Total turnover ratio		−0.045*** (−3.18)
Constant	−0.110*** (−5.841)	−0.417*** (−19.42)
N observations	29,675	29,876
Pseudo R-squared	0.103	0.284

The table reports the output from the probit model regression of the dependent variable, movement status, on the company size: Probability $(MS_{i,t}) = f(\omega M_{i,t})$, where $M_{i,t}$ is the movement dummy variable that equals one if stock i is moved from the Main Market to the AIM and zero otherwise and $M_{i,t}$ are the potential determinants of movement status. Model (1) is the probit model used as the first step of the Heckman procedure when the dependent variable of the second stage is any of the liquidity measures. Model (2) is the probit model used as the first step of the Heckman procedure when the dependent variable of the second stage is any of the volatility measures. The number (N) of observations is the number of stock-month observations of the available data. The statistical significance reported is based on the t-test

***Indicates significance at 1%, **indicates significance at 5% and *indicates significance at 10%. company size, company-level accounting practices, leverage and volume

ratio illustrates that the volatility of the matched firms is significantly higher than that of the MAIN2AIM firms.

The probability of a movement is estimated using the full sample of matched and moved companies before movement as a function of company-specific characteristics. Table 3 shows that, as predicted, companies that are smaller[4] and have higher Amihud illiquidity and bid–ask spread and a lower total turnover ratio are more likely to move from the Main Market to the AIM. However, the coefficient of the volatility measures illustrates that companies with a lower return volatility and high–low ratio are more likely to move; companies with a higher volatility ratio have a higher probability of moving from the Main Market to the AIM.

[4] It should be noted that each moved company is paired with a Main Market company that is in the same industry group and has the nearest firm size (not a similar size) (following Errunza & Miller, 2000).

Table 4 Stock liquidity and movement

	Random effect			2SLS			Heckman		
	Amihud	Bid–ask spread	Total turnover ratio	Amihud	Bid–ask spread	Total turnover ratio	Amihud	Bid–ask spread	Total turnover ratio
Company size	−0.000 (−0.14)	0.000 (1.20)	−0.000 (−0.18)	−0.000*** (−4.74)	−0.000** (−3.01)	0.000 (0.15)	−0.000*** (−14.22)	−0.000*** (−6.01)	0.000*** (7.02)
IAS	0.174** (2.22)	0.006 (0.98)	0.274 (1.66)	−0.887*** (−13.41)	−0.018*** (−5.80)	0.508 (0.88)	−1.005*** (−11.19)	−0.034*** (−5.74)	9.157*** (7.67)
Lambda							2.41*** (17.52)	0.078*** (12.51)	−18.084*** (−8.46)
Volume	−0.000 (−0.41)	0.000 (1.54)	0.000 (0.59)	−0.000*** (−8.20)	−0.000 (−1.12)	0.000 (0.98)	−0.000*** (−13.12)	−0.000*** (−7.03)	0.003*** (7.25)
Leverage	−0.000 (−0.16)	−0.000 (−1.20)	0.006*** (47.01)	0.000*** (5.01)	0.000*** (17.66)	0.006*** (42.22)	0.000*** (3.25)	0.000*** (13.54)	0.005*** (23.12)
Constant	0.111* (1.54)	−0.051*** (7.84)	0.412*** (2.54)	1.529*** (16.99)	0.000 (0.08)	−0.602 (−0.58)	−1.484*** (−12.84)	−0.151*** (−33.03)	11.413*** (8.41)
N observations	28,402	28,613	27,984	27,461	26,947	27,951	29,456	28,910	29,519

The table reports the estimates of stocks' liquidity obtained from the second stage of Heckman, 2SLS and the random effect. The number (N) of observations is the number of stock-month observations of the available data. Reported in parentheses, the t-value is heteroscedasticity-consistent (White, 1980) and adjusted for clustering at the stock level. *** indicates significance at 1%, ** indicates significance at 5% and * indicates significance at 10%

The results of the Heckman procedure and 2SLS are reported in Table 4. In addition, Table 4 compares the results of the self-selection models with random effects[5].

4.1 Liquidity

Empirically, the results obtained in this study confirm the theory and show that trading activity is negatively correlated with Amihud illiquidity (Table 4). The positive and statistically significant relationship of the inverse Mills ratio and Amihud illiquidity explains that companies have a greater probability of moving from the Main Market to the AIM experience higher illiquidity (less liquidity) after the event date[6]. Furthermore, the results show that the company size, international accounting standards and trading volume are negative and statistically significant determinants of the bid–ask spread. Similarly, this study shows that companies with higher leverage have a higher bid–ask spread due to the positive and significant correlation of leverage with the bid–ask spread in both the Heckman and the 2SLS model. Finally, the positive and statistically significant relationship of the inverse Mills ratio and the bid–ask spread shows that companies that have more probability to move from the Main Market to the AIM, face a higher bid–ask spread after the event date.

Moreover, the empirical results illustrate that the total turnover ratios have a positive relationship with company size, international accounting standards and trading volume. This relationship is statistically significant in the Heckman model. In addition, the significant and negative correlation of the inverse Mills ratio with the total turnover ratio shows that companies that are more likely to move from the Main Market to the AIM experience smaller total turnover ratio after the event date. To sum up, the findings on the change in stock liquidity after movement support hypothesis H1. More specifically, it is found that movement significantly increases stocks' transaction cost measured by the bid–ask spread and decreases stocks' turnover ratio.

4.2 Volatility

Table 5 reports a statistically insignificant positive relationship between the total turnover ratio and the return volatility. However, analysing the correlations of IAS, trading volume and leverage shows that companies with IAS, higher trading volume and lower leverage have higher return volatility. Moreover, the negative significant coefficient of lambda used in the Heckman model illustrates that companies that have less probability to move from the Main Market to the AIM, have higher return volatility after the event date. Therefore, this study empirically supports Leuz and Verrecchia (2000) and Brown and Hillegeist (2007), who mention that a higher

[5] Doidge et al. (2004) and Fernandes and Ferreira (2008) directly apply the random effect; however, in this study, the choice between the random effect and the fixed effect is made through the Hausman test.

[6] The random effect shows the importance of considering self-selection bias. As the results show, the result of the random effect (which does not consider self-selection bias) is very different from the results of the Heckman and 2SLS models.

Table 5 Stock volatility and movement

	Random effect			2SLS			Heckman		
	Return volatility	Volatility ratio	High–low ratio	Return volatility	Volatility ratio	High–low ratio	Return volatility	Volatility ratio	High–low ratio
Total turnover	0.051 (0.21)	0. .271*** (125.71)	−0.003*** (−71.48)	−1.315 (−1.85)	0.301*** (58.08)	−0.004*** (−129.03)	−0.058 (−0.54)	0.345 (1.92)	−0.005*** (−87.09)
IAS	−6.004 (−0.04)	−0.049 (−0.49)	0.003 (0.76)	1167.024*** (12.03)	7.238*** (10.84)	−0.016* (−1.84)	50.008***	0.854*** (43.01)	0.020*** (3.57)
Lambda							−43.608*** (3.35)	1.487*** (3.84)	−0.039***(−4.54)
Volume	0 .000 (0.39)	−0.000 (−0.24)	0.000 (1.54)	0.008*** (6.72)	0.000*** (6.81)	0.000 (0.81)	0.002 (0.65)	0.000 (1.83)	0.000 (0.08)
Leverage	0.000 (0.06)	0.001*** (27.00)	−0.000*** (−26.55)	−0.125*** (5.87)	0.001*** (8.49)	−0.000*** (−218.74)	−0.007 (−2.36)	0.001*** (16.01)	−0.000*** (156.58)
Constant	301.002 (5.59)	0.301*** (6.77)	0.064*** (8.23)	−1812.149*** (10.25)	−12.973*** (11.85)	0.048*** (3.95)	93.715*** (9.15)	1.413*** (6.54)	−0.001 (−0.33)
N observations	28,941	29,413	28,974	28,782	28,749	28,782	28,782	28,749	28,782

The table reports the estimates of stocks' volatility obtained from the second stage of Heckman, 2SLS and the random effect. The number (N) of observations is the number of stock-month observations of the available data. Reported in parentheses, the t-value is heteroscedasticity-consistent (White, 1980) and adjusted for clustering at the stock level. *** indicates significance at 1%, ** indicates significance at 5% and * indicates significance at 10%

disclosure level will result in higher stock return volatility. Accordingly, companies that move from the Main Market with a higher disclosure level to the AIM with a lower disclosure level experience a decrease in their return volatility.

Analysing the relationship between the volatility ratio and total turnover ratio, the trading volume and the leverage shows that the volatility ratio is larger when the company has a larger turnover ratio, greater volume and more leverage based on both the Heckman and the 2SLS model. Also the coefficient of IAS illustrates a negative significant relationship in both Heckman and 2SLS model. The positive significant relationship of the inverse Mills ratio and the volatility ratio shows that the companies moved from the Main Market to the AIM experience higher volatility ratio after their movement.

The intraday volatility measured by the high–low ratio, which has a negative and significant coefficient estimate with lambda in the Heckman model, shows that the MAIN2AIM companies encountered a lower high–low ratio after their movement from the Main Market to the AIM. It can also be seen that the intraday volatility is negatively influenced by the total turnover ratio, IAS and trading volume. Analysing the correlations of IAS, trading volume and leverage shows that companies with international accounting standards, higher trading volume and lower leverage have higher high-low ratio. The decrease in the return volatility and high-low ratio after movement shows that the firm level and intra day volatility decrease after moving from the Main Market to the AIM. Hence, in line with the extensive empirical evidence in the literature (Chan & Fong, 2000; Jones et al., 1994; Karpoff, 1987; Schwert, 1989), a smaller trading volume is found to be associated with lower volatility. Overall, according to the empirical evidence, Hypothesis H2, which states that movement from the Main Market to the AIM increases volatility, is not supported[7]. In order to reveal the dynamics, stock liquidity and volatility are examined around the movement dateas shown in Table 6. The findings of the analysis of the evolution of stock liquidity and volatility confirm and further extend the results from the cross-sectional analysis. Supportive of Hypothesis H1, moving from the Main Market to the AIM is found to be associated with lowered trading activities and raised transaction costs. However, the findings do not support Hypothesis H2 that the stock price of moved stocks is more volatile because of more risks originating from less disclosure in the AIM.

Table 7, reporting the mean of the Amihud illiquidity, bid–ask spread and total turnover ratios of the MATCH stocks, reveals that the Amihud illiquidity and bid–ask spread of these stocks decreased after their matched stock event date; it can also be seen that their total turnover ratio increased. On the other hand, the Amihud illiquidity, bid–ask spread and total turnover ratios of the MAIN2AIM stocks are more than one and statistically significant based on the t-test. This finding implies that the MAIN2AIM stocks faced higher Amihud illiquidity and bid–ask spread after their movement from the Main Market to the AIM; however, their total turnover ratio after their movement to the AIM improved. Table 7 also reveals the mean of

[7] The increase in intraday volatility could be due to the structure and low trading of the AIM, which make the stock prices change more to attract investors.

Table 6 Movement and evolution of stock liquidity and volatility

Years around movement								
	−4Y	−3Y	−2Y	−1Y	+1Y	+2Y	+3Y	+4Y
Panel A: Liquidity								
Amihud								
MAIN2AIM	−0.129*** (−4.08)	−0.017*** (−3.46)	−0.082** (−3.54)	−0.038** (−2.41)	0.051 (1.97)	0.084*** (3.65)	0.063*** (2.21)	0.146*** (5.14)
Match	0.032 (0.06)	0.067 (1.27)	0.029** (4.14)	−0.009–0.67	−0.004 (−0.31)	−0.021 (−0.34)	−0.064 (−1.01)	−0.003 (−1.00)
Bid–ask spread								
MAIN2AIM	−0.010*** (−6.12)	−0.004*** (−1.71)	0.009*** (3.87)	0.001 (1.14)	0.008** (3.79)	−0.006 (−1.02)	−0.004 (−0.31)	0.000 (0.64)
Match	−0.004***(−3.87)	−0.004*** (−12.78)	−0.005*** (0.004)	−0.006*** (−4.01)	−0.006*** (−4.29)	0.002** (3.01)	0.007*** (2.71)	0.007*** (8.67)
Total turnover ratio								
MAIN2AIM	−0.519 (−0.21)	−0.847 (−2.07)	−0.287 (−1.45)	−0.564 (−0.74)	1.026 (0.47)	−0.347 (−0.07)	1.009 (−1.89)	−0.579 (−0.74)
Match	0.049*** (7.29)	0.064*** (5.14)	0.014*** (2.31)	−0.019 (−1.87)	−0.046 (−2.41)	−0.045** (−2.87)	−0.097*** (−4.61)	−0.035*** (−5.03)
Panel B: Volatility								
Return volatility								
MAIN2AIM	−42.512 (32.59)	−36.197*** (−2.12)	−12.410 (−1.01)	15.39** (1.02)	8.197 (0.57)	3.192 (0.27)	19.197** (2.03)	18.037*** (1.98)
Match	−88.034*** (−3.41)	−77.278*** (−3.84)	−82.650*** (−2.87)	−3.009 (−0.09)	−28.078 (−1.88)	−24.279 (−1.54)	78.194*** (5.01)	165.697*** (6.24)
Volatility ratio								
MAIN2AIM	−0.491 (−1.03)	−1.279*** (−4.87)	−0.501 (−1.09)	−0.357 (−1.28)	1.647*** (5.24)	−0.547 (−1.24)	0.468** (2.03)	0.716** (2.19)
Match	−0.016*** (−3.05)	0.019*** (4.54)	0.018*** (5.78)	0.035*** (8.15)	0.026*** (7.87)	0.006 (1.02)	−0.035*** (−8.09)	−0.037*** (−10.02)

Table 6 (continued)

Years around movement								
	−4Y	−3Y	−2Y	−1Y	+1Y	+2Y	+3Y	+4Y
High–low ratio								
MAIN2AIM	0.015***(2.81)	0.054*** (5.09)	0.018 (2.14)	0.016** (2.41)	−0.035*** (−5.39)	0.000 (0.09)	−0.020*** (−2.24)	−0.028*** (−4.69)
Match	−0.000 (−1.00)	0.001*** (4.08)	0.000 (1.78)	0.000 (1.64)	−0.001*** (−2.87)	−0.001** (−2.49)	−0.000** (−2.90)	0.001***(4.12)

Panel A of Table 6 reports the estimates from the regressions of the dependent variables—Amihud, bid–ask spread and total turnover ratio—defined in Table 2 (A.1). In the regressions, movement is replaced by a series of year-specific dummy variables relative to the movement date of the MAIN2AIM stocks (0). Model specification: liquidity measure $i,t = \alpha + \Sigma\gamma Yn + \Sigma\beta Di,tVi,t + \Sigma\theta Mi,t + \varepsilon i,t$, where Yn is a variable representing a year relative to the year of movement accordingly (from year −4 to year+4); Di,t is a dummy variable representing movement; Vi are the main stock-specific control variables; and Mi,t are other control variables. Only the coefficient estimates for the year-specific dummies around movement are reported in the table, but the regressions include the full set of control variables. Reported in parentheses, the t-value is heteroscedasticity-consistent (White, 1980) and adjusted for clustering at the stock level. *** indicates significance at 1%, **indicates significance at 5%

Panel B of Table 6 reports the estimates from the regressions of the dependent variables—return volatility, volatility ratio and high–low ratio. In the regressions, movement is replaced by a series of the year-specific dummy variables relative to the movement date of the MAIN2AIM stocks (0). Model specification: volatility measure $i,t = \alpha + \Sigma\gamma Yn + \Sigma\beta Di,tVi,t + \Sigma\theta Mi,t + \varepsilon i,t$, where Yn is a variable representing a year relative to the year of movement accordingly (from year −4 to year+4); Di,t is a dummy variable representing movement; Vi are the main stock-specific control variables; and Mi,t are other control variables. Only the coefficient estimates for the year-specific dummies around movement are reported in the table, but the regressions include the full set of control variables. Reported in parentheses, the t-value is heteroscedasticity-consistent (White, 1980) and adjusted for clustering at the stock level. ***indicates significance at 1%, **indicates significance at 5%

Table 7 Changes in stock liquidity, volatility and firm characteristics around movement: Univariate analysis

Variable	Movement status	Mean	Mean difference from 1	
			t-stats	Pr(t)
Liquidity				
Amihud ratio	MAIN2AIM	3.659	6.128	< .0001
	MATCH	2.503	5.228	< .0001
Bid–ask spread ratio	MAIN2AIM	1.946	8.641	< .0001
	MATCH	0.854	− 3.120	0.0040
Turnover ratio	MAIN2AIM	1.575	3.659	0.0003
	MATCH	1.959	4.259	< .0001
Volatility				
Return volatility ratio	MAIN2AIM	0.841	− 2.801	0.007
	MATCH	5.022	10.211	< .0001
Volatility ratio	MAIN2AIM	1.152	0.495	0.498
	MATCH	1.027	0.132	0.603
High–low ratio	MAIN2AIM	0.701	− 2.845	0.469
	MATCH	1.540	1.878	0.106

Panel A of the table reports the number of observations and the mean ratios of the stock liquidity and volatility measures by different movement statuses. The ratios are calculated as the average liquidity/volatility measure for the period of time after the movement date over the base liquidity/volatility measure, which is the average liquidity/volatility measure for the time before the movement date (at least 12 months). Additionally, the table reports the t-statistics and p-value of the test of the difference in the means of the ratios from one (a ratio of one would indicate no change in the liquidity/volatility measure after movement)

the volatility ratios of the MAIN2AIM and MATCH stocks. It can be seen that the mean of the return volatility ratio of the MAIN2AIM stocks is less than one, which denotes a decrease in their return volatility after their movement to the AIM. On the other hand, the return volatility of the MATCH stocks shows that these stocks experienced higher return volatility after their matched stock event date. The mean comparison of the high–low ratio of the MAIN2AIM and MATCH stocks signifies that although MATCH stocks experienced an increase in their high–low ratio, consistent with the results reported in previous sections, MAIN2AIM stocks show lower high–low ratio after moving from the Main Market to the AIM. Finally, Table 7 shows no significant difference in the volatility ratio of both MAIN2AIM and MATCH stocks before and after the event date.

The univariate analysis reported in Table 7, compared the liquidity and volatility of both MAIN2AIM and MATCH stocks after event date with their own liquidity

Table 8 Changes in stock liquidity and volatility around movement: Regression analysis

	Liquidity			Volatility		
	Amihud ratio	Bid–ask spread ratio	Total turnover ratio	Return volatility ratio	Volatility ratio	High–low ratio
Model (1)						
Movement status	0.741*** (8.42)	0.901*** (8.09)	0.463 (1.87)	−2.897*** (−33.01)	0.098*** (6.87)	−2.138*** (−58.82)
Intercept	2.284*** (5.87)	0.581*** (7.80)	1.901*** (11.04)	5.137*** (9.12)	1.549*** (11.08)	2.479*** (8.82)
Adj. R−sq	0.021	0.081	0.001	0.041	0.019	0.137
Model (2)						
Movement status	0.659*** (6.12)	0.497*** (9.08)	0.912*** (3.15)	−0.887*** (−10.59)	0.113*** (4.87)	−2.193*** (−16.28)
Company size ratio	−3.208*** (−6.87)	−3.509*** (−15.49)	9.089*** (7.39)	12.151*** (9.51)	−0.209*** (−2.88)	0.401** (2.08)
Trading volume ratio	−0.001** (−2.78)	0.000 (0.58)	0.018*** (7.32)	0.001*** (3.22)	−0.001*** (−9.38)	0.000 (0.21)
Leverage ratio	−0.241*** (−4.15)	0.137*** (15.45)	0.228 (1.46)	0.031 (0.91)	0.028** (2.87)	0.078*** (3.64)
Intercept	5.841*** (11.09)	4.341*** (7.12)	−8.114*** (−5.81)	−10.802*** (−13.64)	1.379*** (14.12)	1.964*** (9.41)
Adj. R-sq	0.045	0.171	0.039	0.187	0.056	0.108
N observations	31,184	31,184	31,184	29,342	29,342	29,342
N stocks	476	476	476	476	476	476

The table reports the estimates from the regressions of the dependent variables, the Amihud illiquidity, bid–ask spread, total turnover ratio, return volatility, volatility ratio and high–low ratio variables, as defined in Table 2 (A.1), to the appropriate base measure, that is, the average measurebefore the movement date. Model specification: (Liquidity or Volatility Measure i,t / Liquidity or Volatility Measure i,base) = $\alpha + \gamma Di,t + \Sigma\theta(Mi,t / Mi,base) + \varepsilon i,t$, where Liquidity or Volatility Measure i,base is the average liquidity or volatility measure over the period of time before the movement date; Di,t is a dummy variable representing MAIN2AIM and MATCH stocks; Mi,t are control variables; and Mi,base is the average control variable over the period of time before movement date. The control variables are calculated as the ratio of the control variables, to the appropriate base measure, that is, the average measure for the period of time before stocks' movement date. The number (N) of observations is the number of stock-month observations of the available data. Reported in parentheses, the t-value is heteroscedasticity-consistent (White, 1980) and adjusted for clustering at the stock level. ***indicates significance at 1%, **indicates significance at 5% and *indicates significance at 10%

and volatility before event date by comparing just the mean of liquidity and volatility of before and after movement. The multivariate analysis reported in Table 8, is regressing the liquidity and volatility measure ratios by considering the dummy variables representing the movement status and the ratios of the control variables in order to determine the primary determinants of the changes in stock liquidity and volatility around the movement[8]. A stock movement to the AIM is associated with a significant increase in the Amihud illiquidity and bid–ask spread (Model (1), Table 8). Additionally, Model (2) controls for changes in the firm characteristics; as expected, a significant portion of the decrease in liquidity around movement can be explained by the decrease in the company size. Furthermore, part of the Amihud illiquidity and bid–ask spread increase can be explained by the lower stock trading volume and leverage after stocks' movement. In addition, the higher turnover ratio after movement might be because of better accessibility for investors who prefer to invest in illiquid stocks, which have a lower trading level.

Overall, the empirical results of the time-series analysis of the changes in stock liquidity after the event date support Hypothesis H1 that moving from the Main Market to the AIM worsens the liquidity of a stock as a result of a deterioration in the information environment.

Based on the regression output of Models (1) and (2) (Table 8), Model (1) illustrates that after the event date[9], companies' movement status has a significant negative correlation with their return volatility and high-low ratio and a positive correlation with their volatility ratio. Based on Model (2) that additionally controls for changes in firm characteristics, an increase in the company size, trading volume and leverage after the event date increase return volatility and high-low ratio, which themselves have significant negative relationship with the movement status.

Moreover, Table 8 depicts that the volatility ratio after the event date has a significant positive relationship with the movement status, which means that moved companies have a higher volatility ratio than their matched companies. In addition, Model (2) of Table 8 explains that the volatility ratio has a significant negative correlation with the company size and trading volume and a significant positive correlation with the leverage ratio. The coefficients between the volatility ratio and the firm characteristics explain that although generally the volatility ratio increased after stocks' movement to the AIM, the companies with a smaller size, lower trading volume and higher leverage have a higher volatility ratio. Finally, in line with the theoretical expectations, the high–low ratio is negatively correlated with the movement status, which confirms that the stocks that moved from the Main Market to the AIM experienced a lower high–low ratio after their movement. Moreover, Model (2) of Table 8 clarifies the relationship between the high–low ratio and the firm characteristics.

Overall, the empirical results of the time-series analysis of the changes in stock volatility after moving from the Main Market to the AIM do not support Hypothesis

[8] The difference between this section and privous section is that privous section aim is to find out whether generally stock liquidity increased or decread after movement. However, this section is to identify the main determinants of the changes in stock liquidity and volatility around the event date.

[9] 'Event date' illustrates the date on which each MAIN2AIM company moved from the Main Market to the AIM and is used as the event date for the paired company in the MATCH group.

H2, which relates to the increase in stock volatility after moving from the Main Market to the AIM due to the worsening of the stock's information environment.

5 Conclusion

A company's commitment to lower levels of information disclosure and scrutiny by market participants after moving from the Main Market to the AIM should increase the information asymmetry between managers and investors and between different groups of investors. The worse information environment of the stock after movement, in turn, should negatively affect stock liquidity and volatility. This study tests this proposition empirically by examining the changes in stocks' liquidity and return volatility after their movement from the Main Market to the AIM of the London Stock Exchange. The sample used in the study is a set of moved (MAIN2AIM) and matched (MATCH) companies; MAIN2AIM contains companies that moved from the Main Market to the AIM between January 1996 and December 2013. Each company in the MATCH group is a company that stayed in the Main Market and is paired with one company in the MAIN2AIM group.

Since movement to the AIM deteriorates stocks' information environment due to the lower level of information disclosure by companies as well as the production of less stock-specific information by a decreased number of investors, the MAIN2AIM stocks are expected to be less liquid and show more return volatility than the MATCH stocks. Three different methods are used to evaluate the relationship between the movement status and the stock liquidity and volatility. Firstly, the liquidity and volatility of the MAIN2AIM stocks are compared with the MATCH stocks, controlling for other determinants of stock liquidity and volatility in the cross-sectional analysis. Secondly, the evolution of the stock liquidity and volatility measures is tracked in the years around the movement date using the sample of MAIN2AIM stocks as well as the MATCH stocks. Thirdly, the stock liquidity and volatility after the movement date are evaluated against those of the same stocks for the period of time prior to the movement date using time-series analysis.

The empirical evidence shows that, compared with the stocks that stayed in the Main Market, the stocks that moved to the AIM have a lower level of trading activity, higher transaction costs and a less volatile stock return. After controlling for self-selection bias and other factors that potentially affect stock liquidity and return volatility, a movement from the Main Market to the AIM is associated with significant decrease in liquidity and increase in transaction costs measured by the Amihud illiquidity and bid–ask spread, along with a decrease in trading volumes and a significant reduction in return volatility. The changes in liquidity and volatility after movement are mainly explained by the increase in the transaction costs and decrease in the companies' trading activities after movement. The important finding is that the impact of movement on stock liquidity is sustained over time. More specifically, the observed increase in Amihud illiquidity and the bid–ask spread and the decrease in volatility are sustained for four years after moving from the Main Market to the AIM. The evidence from time-series analysis that investigates the changes in the

liquidity and volatility of the MAIN2AIM stocks suggests that movement is associated with a significant decrease in stocks' liquidity. This is true even after controlling for the change in firm characteristics following the change in movement status.

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