

Accounting Information Quality and Stock Return Liquidity

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ABSTRACT

The goals of this study are to explore the relationships between the accounting information quality and stock liquidity. The sample period is divided into three sub periods: convergence period, preparation period and adoption period to examine the relationships remain the same or the not. The accounting information quality is proxy by discretionary accruals. This study employed modified Jones model provided by Kothari et al. (2005) to estimate the discretionary accrual. Using the Amihud liquidity index to measure the stock liquidity and panel data analysis, impacts of accounting information quality on the stock return and stock liquidity are examined respectively. The empirical analysis indicates that the illiquidity has positive relation with the accounting information quality. Moreover, the accounting information quality is improved after the mandatory adoption of IFRS, concurrently; the liquidity is also improved, especially in preparation period. The effect of AIQ on stock performance is clear when we estimate this relationship separately. The firms which are listed on OTC market are affected by statistic significant accounting information quality and the firms which are listed on OTC market are not.

Keywords: *Stock Liquidity, Accounting Information Quality, Stock Return*

1. INTRODUCTION

International Financial Reporting Standards (IFRS) are a set of accounting standards developed by the International Accounting Standards Board (IASB) that is becoming the global standard for the preparation of public company's financial statements. By adopting IFRS, a business can present its financial statements on the same basis as its foreign competitors, making comparisons easier. Evidences from literatures show that the accounting information quality is improved after the mandatory adoption quality of accounting information not only can reduce the liquidity uncertainly of IFRS. Good and liquidity systematic risks, but also can predict correctly the future stock prices (Chua Yi Lin et al., 2012, Daske, 2008, Doukakis, 2010, George Artikis, 2012).

The number of countries that required or allow the use of IFRS for the preparation of financial statements by publicly held companies has continued to increase. That is the motivation for the researchers all over the world to study the effects of IFRS adoption or convergence. Many prior studies present mixed results and show that the effects sometimes depend on voluntary or mandatory adoption. Daske et al. (2008) examine the economic

consequence of mandatory IFRS reporting in 26 countries around the world. They find that, market liquidity increases around the time of the introduction of IFRS. They also document a decrease in firms' cost of capital and an increase in equity evaluation, but only if they account for the possibility that the effects occur prior to the official adoption date. By examining European stock market reactions to events related to the adoption of IFRS, Armstrong et al. (2009) find an incrementally positive reaction for firms with lower quality pre-adoption information, and with higher pre-adoption information asymmetry. They also find a positive reaction to IFRS adoption events for firms with high quality pre-adoption information. Zeghal et al. (2011) find that the mandatory adoption of IAS/IFRS is associated with a reduction in the earnings management level by investigating French listed firms. Whereas, Tendeloo and Vanstraelen (2005) study German listed companies and indicate that voluntary adopters of IFRS in Germany cannot be related to lower earnings management.

One of the aims of IFRS is to provide transparent information for investors and other users of financial information. It could be understood that information environment will be enhanced under IFRS adoption or convergence. Using data in Australia, Chua et al (2012) find that the mandatory adoption of IFRS has resulted in better accounting quality than previously under Australian generally accepted accounting principles (GAAP). Lang and Maffett (2011) show that transparency reduces firm-level liquidity uncertainty, while Jeffery Ng (2011) indicates that increased information quality can reduce a firm's exposure to systematic liquidity risk. Investors interested in liquidity because it is the degree to which an asset or a security can be bought or sold in the market without affecting the asset's price. Therefore, this paper focuses on the effect of adoption IFRS on accounting information quality, then, impact on liquidity and stock return.

With the advantages of adopting or converge to IFRS, it is necessary for Taiwan to study and follow it. There have been some studies about the effects of IFRS convergence or adoption in Taiwan. Lin et al. (2012) use listed firms data from 1999 to 2009 to investigate the convergence impacts on financial reporting quality. They find that the financial reporting quality got improvement under amendment towards IFRS adoption. Seng (2014) selects data to investigate the impact of the quality of disclosures of financial reports of the listed companies in Taiwan under the first full adoption of IFRS. Results show that the disclosures have relationship with the IFRS adoption.

In this paper we use Amihud liquidity index to measure the stock liquidity and panel data analysis, impacts of accounting information quality on the stock return and stock liquidity are examined respectively. We also employed modified Jones model provided by Kothari et al. (2005) to estimate the discretionary accruals. We find that there is a significant positive relationship between the illiquidity and the accounting information quality. Besides, the accounting information quality is improved after the mandatory adoption of IFRS, concurrently, the liquidity is also improved, especially in preparation period. On the other

hand, when we estimate the changes of the illiquidity in two markets (OTC and TWSE), the effect of accounting information quality on the illiquidity in OTC market is statistically significant, while in TWSE market is not.

The paper is organized as follows. Section 2 describes literature review. Section 3 presents the hypothesis of the illiquidity and accounting information quality and methodology. Section 4 is empirical results. Finally, section 5 is conclusions.

2. LITERATURE REVIEW

2.1 Accounting information quality and Stock Return

The relation between stock returns and accounting information has been an internationally popular subject of research for more than thirty years. In an introductory context, Dimitropoulos & Asteriou (2009) examines the earnings-return relation applying four models, proposed by Kothari and Zimmerman (1995). The overall results, demonstrated a significant value relevancy of accounting earnings prepared under the Greek GAAP. Also, the use of cross-sectional and time-series aggregated data results in a large increase in the explanatory power of earnings for returns. This is consistent with Dimitropoulos & Asteriou (2009), Angahar and Malizu indicated that there is a significant relationship between accounting information and stock prices in the NSE. The conclusion drawn is that there is a significant relationship between earnings and stock returns in the Nigerian stock market, hence earnings are related to both price and return in the Nigerian stock market, while change in earnings is not significantly related to stock return. In the relationship between disclosure quality and common stock returns with two main components of reliability and timeliness, there is a positive and significant relationship between disclosure quality of company and timeliness of information and financial statements with common stock returns, but there is no significant relationship between reliability of financial information and stock return. The recent studies of Medeiros (2005) have shown that firms with higher levels of disclosure present lower volatility of stock returns. Additionally, Olugbenga (2004) shows that there is a significant relationship between accounting information and share prices of companies listed on the Nigerian Stock Exchange. This paper recommends that any effort geared towards improving quality of accounting information is in a right direction. However, Tran Thi Thanh Hai (2005), based on Easton & Harris model (1991) and used quantity approach and data estimation techniques of Pooled Regression Model, Fixed Effects Model (FEM) and Random Effects Model (REM), indicate that there is an association between accounting information and stock returns in Vietnam, but this association is considerably weak. This result implies that the accounting information is less useful to make investment decisions in the Vietnamese stock market.

2.2 Accounting information quality and Liquidity

Liquidity is negatively related to the level of adverse selection in the market, which

results from some traders having informational advantage over other traders (Katsiaryna (2011)). If better quality financial information reduces the level of adverse selection in the market, then liquidity will increase. Empirical literature on the relation between the quality of financial information and liquidity is limited (Leuz and Verrecchia (2000)). Several papers examine the association between liquidity and analyst evaluations of disclosure quality (Welker (1995), Healy, et al. (1999) and Heflin, et al. (2005)). They find that better disclosure increases liquidity.

The liquidity literature and the accounting literature are naturally related because accounting information can affect the information environment of the stock. Theoretical works in microstructure often model stock illiquidity as the inverse of market depth or the price change per unit of order flow (i.e., price impact) (Kyle (1985), Admati and Pfleiderer (1988)). To the extent that the release of accounting information can reduce information asymmetry in the marketplace, such information can improve stock liquidity (see, e.g., Diamond and Verrecchia (1991)). Ng.J (2011) investigated and provided empirical evidence on the relation between information quality and liquidity risk that higher information quality could lower cost of capital through lower liquidity risk. Amihud (2002) announced that lack of expected liquidity has positive relationship with additional anticipated stock. He announced that part of additional expected stock is described by lack of liquidity and lack of liquidity has more influence on stock of small firms. If liquidity is less, the share of attraction is less too. Liquidity risk is a type of risk related to stock return and is not eliminated through diversity and originates from effect of price of orders and in one model it is based on not complete competition to risk market (Jeffery Ng, 2011)

3. DATA AND METHODOLOGY

3.1 Hypotheses

The aim of this paper is to determine the relationship between the accounting information quality and stock returns and stock liquidity. The empirical study will be based on a sample of listed Taiwan stock exchange in the period from June 2008 through September 2015. There are three hypotheses as following:

H₁: Higher information quality higher stock liquidity.

H₂: Liquidity of preparation and adoption period is higher than convergence period.

3.2 The definition and measurement of variables.

3.2.1 Measure of liquidity.

We used Amihud's (2002) illiquidity measure (ILLIQ) to estimate the liquidity for each firm. ILLIQ is defined as the absolute value of daily stock price, R, divided by the daily dollar trading volume, VOLD. It measures the trading volume needed to move the stock price. Higher ILLIQ, lower liquidity and vice versa.

To fit with the data from the financial statements, we calculated quarterly ILLIQ for each firm i for each quarter d as follows:

$$\text{ILLIQ}_{id} = \frac{|R_{id}|}{\text{VOLD}_{id}} * 106 \quad (1)$$

Where R_{id} is quarterly return; VOLD_{id} is the sum of monthly trading value for firm i in the quarter d .

3.2.2 Measure of accounting information quality.

Among the various discretionary accrual models, Dechow et al. (1995) report that the Jones and the modified-Jones models perform the best. This study employed the modified Jones model provided by Kothari et al. (2005) to estimate the discretionary accruals. We define total accruals (TA) as the change in non-cash current assets minus the change in current liabilities excluding the current portion of long-term debt, minus depreciation and amortization, scaled by lagged total assets.

The Jones model discretionary accrual is estimated cross-sectionally each quarterly using all firm listed on TWSE.

$$\frac{\text{TA}_{it}}{\text{ASSETS}_{it-1}} = \beta_0 + \beta_1 \frac{1}{\text{ASSETS}_{it-1}} + \beta_2 \frac{\Delta \text{SALE}_{it}}{\text{ASSETS}_{it-1}} + \beta_3 \frac{\text{PPE}_{it}}{\text{ASSETS}_{it-1}} + \varepsilon_{it}, \quad (2)$$

where ΔSALE_{it} is change in sales scaled by lagged total assets, ASSETS_{it-1} , and PPE_{it} is net property, plant and equipment scaled by ASSETS_{it-1} .

In the process of regression this model, we got the ε_{it} (Standardized Residual) or the difference between total accruals (TA) and cash flow from operating that measures accounting information quality, $\text{AIQ}_{i,t} = |\varepsilon_{i,t}|$.

3.3 Sample selection and study period

Taiwan listed companies are required to prepare financial statements in accordance with Taiwan-IFRS starting from January 1, 2013 to enhance the international competitiveness of local capital markets and make the markets more attractive to foreign investors. Hence our study period is from June 2008 to September 2015. To calculate ILLIQ we get the monthly data of *price, amount and return*. To compute ε_{it} in the equation (2), we get the quarterly data of *total cash, current assets, current liabilities; current long-term debt, depreciation, amortization, total assets, sale and net property, plant and equipment* of companies' stock came from the Taiwan Economic Journal Database (TEJ). During study period, we excluded firm observations that do not have sufficient data to compute, then, our sample include 1101 companies. The sample period is divided into three sub-periods: convergence period (2008Q2-2009Q1), preparation period (2009Q2-2012Q4) and adoption period (2013Q1-2015Q3) to examine the relationships remain the same or not.

3.4 ANOVA test

We predict that there are differences in mean of ILLIQ and Standardized Residual in three periods. Thus we use ANOVA test to examine this issue. We have null hypothesis: H_0 : There is no differences in the mean of ILLIQ and standardized residual. If there is difference between three periods, we estimate the equation (2) with two dummy variables and we wish the liquidity of preparation and adoption period is higher than convergence period.

D1=1 if in period 2, otherwise D1=0

D2=1 if in period 3, otherwise D2=0

3.5 Regression model

We further use the regression model to examine the accounting information quality and illiquidity. The dependent variable is ILLIQ and the independent variable is AIQ_{i,t} get from (2) equation. We also include the following variables as control variables: logarithm of price (lnPrice), logarithm of market capitalization (ln market cap) and volatility of returns (Std_return), since these variables have been shown to determine liquidity (Brockman, Chung, and Yan (2009)). For price and market cap variables we get the data at the end of each quarter, for std_return we calculate volatility of quarterly returns within three months.

The regression equation is as follows: $ILLIQ_{i,t} = \beta_0 + \beta_1 AIQ_{i,t} + \Omega Control_{i,t} + \varepsilon_{it}$ (3)

4. EMPIRICAL RESULTS

4.1 Descriptive Statistic

This paper mainly discussed about the accounting information quality will react to the liquidity, implying to the return stock. We consider TWSE and OTC market separately because lacking of transparency financial information of the OTC market. Table 1 showed the summary statistics of ILLIQ, AIQ and the control variables (lnP, stdR, lnMV) of 1101 firms listed on TWSE. The mean of the illiquidity (ILLIQ) during the sample period are 2996.16 for OTC market and just 955.48 for TWSE market, corresponding to standard deviation is 12536.39 and 7355.73. Besides, the mean of AIQ for OTC market is higher than one for TWSE market, which means that the poorer accounting information quality, the higher illiquidity.

In order to light out our arguments about the relationship between AIQ and ILLIQ for three periods remain the same or not, we calculated the mean of AIQ and ILLIQ for that periods. The result was shown in Table 2. The Panel A, which illustrated the ILLIQ decreases through each period for both OTC and TWSE markets. Particularly, for TWSE market, the ILLIQ decreases from 2697.82 in period 1 to 744.09 in period 2 and 569.25 in period 3, this is similar for OTC market and for total market. We can see that the illiquidity sharply reduces from period 1 through period 2 and decreases a little from period 2 through period 3. Look at

the Panel B, it presented the mean of AIQ for each period in each market. Overall the AIQ index also decreases though each period, however, for the OTC market, this AIQ increased slightly from period 1 through period 2.

In summary, the mean of illiquidity in preparation period and adoption period is lower than in convergence period, which means that the accounting information quality is relatively active with the liquidity of the stocks.

Table 1: Summary statistic.

This table reports the summary statistics of mean and standard deviation of ILLIQ, AIQ and the control variables (LnP, stdR, LnMV) of 1101 firms from TWSE and OTC markets.

	TWSE		OTC		ALL	
	Mean	S.D	Mean	S.D	Mean	S.D
ILLIQ	955.5	7356	2996	12536	1725	9691
AIQ	0.035	0.043	0.043	0.053	0.038	0.047
StdR	9.388	7.571	11.28	9.358	10.10	8.340
LnMV	8.781	1.491	7.346	1.079	8.240	1.519
LnP	3.042	0.870	2.935	0.839	3.002	0.860

Table 2: Summary statistics of the illiquidity and the accounting information quality.

This table indicates the mean of the illiquidity and the accounting information quality during the subperiods: period 1 (convergence period: 2008Q2-2009Q1), period 2 (preparation period: 2009Q2-2012Q4) and period 3 (adoption period-2013Q1-2015Q3).

Mean			
Panel A: ILLIQ			
	TWSE	OTC	ALL
Period 1	2697.82	7080.48	4349.78
Period 2	774.09	2288.18	1344.80
Period 3	569.25	2476.38	1288.11
Panel B: AIQ			
	TWSE	OTC	ALL
Period 1	0.0374	0.0439	0.0398
Period 2	0.0352	0.0443	0.0386
Period 3	0.0334	0.0419	0.0366

4.2 T-test, ANOVA

Based on the summary statistics provided by Table 1, the illiquidity on the OTC market is higher than one on TWSE market, while the AIQ index is also higher. In this section we further test the mean differences between two market (TWSE & OTC) of the illiquidity and

the accounting information quality respectively, are statistics significantly or not. The results are shown in the table 3.

The table shows the T-tests of mean differences of ILLIQ and AIQ between two markets. This mean differences are significant at 5% level for both ILLIQ and AIQ. We look again at the Table 1, the OTC market has more impact to ILLIQ and AIQ variables.

Table 3: T-Test for the illiquidity and the accounting information quality

	t-value	Sig
ILLIQ	-16.524	.000***
AIQ	-15.172	.000***

*** are significant at 5% levels

In purpose to examine whether the illiquidity were affected by the accounting information quality through three sample period or not, we performed the ANOVA methodology to test differences between the means of the accounting information quality of three periods. In test of homogeneity of variances in the Table 4, we can see that Levene Statistic equals to 6.252 and sig = 0.002 < 0.05, it means that variances in each period is not equal. This is proved clearly in the ANOVA panel with sig = 0.000 between periods. There were statistically significant differences between periods means as determined by one-way ANOVA.

Table 4: ANOVA analysis for differences between the means of the accounting information quality of three periods.

Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
AIQ	6.252***	2	33027	.002

ANOVA

	df	Mean Square	F	Sig.
AIQ Between Priods	2	.023	10.148	.000***

*** are significant at 5% levels

4.3. Regression model

The differences of the accounting information quality between periods are significant statistically based on ANOVA test in section 4.2. We wonder whether the AIQ can predict the ILLIQ of stocks or not. Regression analysis, adding logarithm of price (lnP), logarithm of market capitalization (lnMV) and volatility of returns (StdR) as control variables, is used to explore this relationship.

First, we test whether changes in illiquidity are impacted by the accounting information quality by estimating the following model:

$$\text{Model 1: } ILLIQ_{i,t} = \beta_0 + \beta_1 AIQ_{i,t} + \Omega Control_{i,t} + \varepsilon_{it}$$

Descriptive statistics results in the previous section indicated that the illiquidity is moving in the same direction with the quality of accounting information. Therefore, we expect positive coefficient on AIQ variable.

Model 2 includes one D1 dummy variables and Model 3 includes one D2 dummy variables.

$$\text{Model 2: } ILLIQ_{i,t} = \beta_0 + \beta_1 AIQ_{i,t} + \beta_2 D1_{i,t} + \Omega Control_{i,t} + \varepsilon_{it}$$

$$\text{Model 3: } ILLIQ_{i,t} = \beta_0 + \beta_1 AIQ_{i,t} + \beta_2 D2_{i,t} + \Omega Control_{i,t} + \varepsilon_{it}$$

We also estimate model with both D1 and D2.

$$\text{Model 4: } ILLIQ_{i,t} = \beta_0 + \beta_1 AIQ_{i,t} + \beta_2 D1_{i,t} + \beta_3 D2_{i,t} + \Omega Control_{i,t} + \varepsilon_{it}$$

In these models D1 is a dummy variable that equals one for period 2 and zero for others, D2 is a dummy variable that equals one for period 3 and zero for others. From the analysis in Table 2 we hope that the accounting information quality is improved after the adoption of IFRS. Thus, we expect negative coefficient on D1 and D2.

We estimate models with changes in illiquidity in total market, TWSE market and OTC market. The results are shown in table 5.

Table 5: Cross-sectional determinants of changes in illiquidity.

Independent variable is illiquidity ILLIQ and dependent variable is accounting information quality AIQ, control variable is logarithm of price (LnP), logarithm of market capitalization (LnMV) and volatility of returns (StdR). In model 2 we includes two dummy variables, D1 is a dummy variable that equals one for period 2 and zero for others, D2 is a dummy variable that equals one for period 3 and zero for others.

Panel A: Total market								
	Model 1		Model 2		Model 3		Model 4	
C	29296	***	29827	***	30419	***	29562	***
LnP	-2189	***	-2051	***	-2061	***	-2067	***
lnMV	-2645	***	-2729	***	-2854	***	-2677	***
StdR	67	***	69	***	73	***	67	***
AIQ	3071	***	3113	***	3191	***	3082	***
D1			-537	***			-637	***
D2					420	***	-136	
Panel B : TWSE								
C	30374	***	30706	***	31251	***	30996	***
LnP	-94		-11		-4		0.5	
lnMV	-3373	***	-3426	***	-3520	***	-3476	***
StdR	44	***	45	***	49	***	47	***
AIQ	1929		1937		2018		1976	
D1			-247	***			-157	

D2					262	***	123	
Panel C: OTC								
C	28862	***	29563	***	29872	***	28114	***
LnP	-4440	***	-4254	***	-4298	***	-4397	***
lnMV	-1921	***	-2022	***	-2150	***	-1652	***
StdR	97	***	99	***	102	***	92	***
AIQ	4255	***	4389	***	4382	***	4240	***
D1			-1070	***			-1831	***
D2					536	***	-1033	***

***are significant at 5% levels

Panel A estimates four models for illiquidity in total market. Consistent with descriptive statistics, we find that the coefficient on AIQ is positive and significant at 5% in both four models, suggesting that accounting information quality result in higher illiquidity or lower liquidity. LnP variable is negative and significant (at 5% level), suggesting that stocks with higher price experience smaller increase in illiquidity for both two models. This is also similar to lnMV variable. The firms with higher volatility of returns have greater increase in illiquidity as suggested by positive and significant coefficient on StdR.

For two dummy variables, the coefficient on D1 is negative and significant at 5% in both Model 2 and Model 4, the coefficient on D2 is negative in Model 4 but it becomes insignificant. It means that the liquidity in preparation period and adoption period is better than one on convergence period. However, IFRS adoption is new and the data is examined in short time, leading to the coefficient on D2 is insignificant.

Now, let us consider the changes in illiquidity in TWSE market (Panel B) and OTC market (Panel C) concurrently. Overall, coefficient on AIQ is positive and significant at 5% in OTC market but insignificant in TWSE. In Taiwan, there are two main stock markets, Taiwan Stock Exchange (TWSE) and Over-the-counter (OTC) market. The requirements of listing on TWSE are more and stricter than on OTC. Same as for the accounting statements provided. Due to the considering of liquidity and institutional investors' trading policy, the trading volume of TWSE is vaster than of OTC. Thus the effect of AIQ on stock performance in TWSE is not significant.

5. CONCLUSIONS

Recently, Taiwan financial markets have many new financial instruments in order to attract a lot of investors to come and invest in, therefore, Taiwan listed companies are required to prepare transparency financial information to enhance the international competitiveness of local capital markets and make the markets more attractive to foreign investors. This paper studies changes in Amihud (2002) measure of illiquidity around apply Taiwan-IFRS starting from January 1, 2013 implying find out the relationship between the accounting information

quality and the liquidity, stock returns.

We find that illiquidity has positive relation with the accounting information quality. This result is consistent with findings of Katsiaryna (2011), who show that liquidity is negatively related to the level of adverse selection in the market, which results from some traders having informational advantage over other traders. We divided the data into three sub-periods around apply Taiwan-IFRS. The results indicate that the accounting information quality is improved after the mandatory adoption of IFRS, concurrently, the liquidity is also improved, especially in preparation period. The effect of AIQ on stock performance is clear when we estimate this relationship separately. The firms which are listed on OTC market are effected by statistic significant accounting information quality and the firms which are listed on OTC market are not.

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