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## Financial openness and market liquidity in emerging markets

Chia-Hao Lee<sup>a</sup>, Pei-I Chou<sup>b,\*</sup><sup>a</sup> Department of Finance, National Taichung University of Science and Technology, Taichung 404, Taiwan<sup>b</sup> Department of Business, National Open University, 172, Zhongzheng Rd., Luzhou Dist., New Taipei City 247, Taiwan

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### ABSTRACT

The goal of this study is to explore the effect of financial openness in emerging markets on the domestic financial market liquidity and then to clarify the linkage between financial openness and market liquidity. The empirical results show that higher the degree of the financial market openness enhances the domestic financial market liquidity, and the effect of the financial market openness on the emerging markets is more significance than the developed markets. We expect the empirical results of this study can provide a new insight into the development of emerging financial markets.

### 1. Introduction

Against a backdrop of growing globalization and Internet use, worldwide financial markets have become increasingly more integrated over the last decade, prompting cross-border trade between developed countries, and the rapid growth of emerging economies (Lane and Miles-Ferretti, 2001, 2003, 2008). The globalization of financial markets has caused structural changes in capital markets across the world. In particular, modes of saving and investment in emerging economies induce structural changes in their financial markets as they become increasingly more open. Moreover, financial market liberalizations, accompanied by more financial and technical resources from advanced economies flow into the young emerging countries are expected to boost their domestic productivity and promoting market development (Kose et al., 2009).

Capital market globalization strengthens the links between the financial markets of industrialized countries and emerging economies, and then encourages the trading of assets (e.g., bonds, shares, and currencies) between markets, banks, firms, and governments. Levine and Zervos (1996) show that financial liberalization results in an increase in stock market liquidity. Levin (2005) suggests that although the significant differences in financial market development across countries exist, the capital markets globalization allows emerging economies to obtain funds at substantially low costs in global capital market. Therefore, emerging economies can accumulate capital, and increase the size of local financial markets. Moreover, previous studies have observed that opening financial markets in emerging economies fosters the development of local financial intermediaries in the following ways: (1) By enabling local financial markets to expand, opening financial market renders financial intermediaries more efficient, causing monetary regulations to be lifted, and enabling floating interest rates to enhance competition between institutions, thereby reducing capital costs (Baldwin and Forslid, 2000). (2) By improving financial service quality and bank competitiveness in local financial markets, it increases the efficiency of financial intermediaries and reduces capital costs (Levine, 1996; Caprio and Honohan, 1999). Finally, (3) by expediting the replacement of inefficient financial institutions with more efficient ones, it creates pressure for domestic financial reform; reduces information asymmetry, adverse selection, and moral hazards; and attracts

\* Corresponding author.

E-mail addresses: [chlee@nutc.edu.tw](mailto:chlee@nutc.edu.tw) (C.-H. Lee), [peiichou@mail.nou.edu.tw](mailto:peiichou@mail.nou.edu.tw) (P.-I. Chou).

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investment (Stulz, 1999; Stiglitz, 2000; Claesens et al., 2001; Chinn and Ito, 2006). In summary, the previous studies have indicated that opening financial markets in emerging economies can facilitate the operation of local financial institutions, thereby facilitating capital cost reduction and attracting more investment; and also that increased investor participation can improve the capital liquidity of markets.

In a capital market, the capital liquidity could reflect the transaction costs of investors, which are subject to investors' transactional behaviors. The liquidity of a financial market therefore affects asset prices in an emerging economy. Institutional investors share the view that high-market liquidity facilitates block trades, thereby reducing transaction costs. For firms in emerging economies, high-market liquidity facilitates lowering the cost of fundraising and increasing a firm's value. High-market liquidity also attracts further investment, thereby boosting market vitality, accelerating capital use, and promoting capital formation and economic development (Amihud and Mendelson, 1986, 1988; Hasbrouck and Schwartz, 1988). Thus, further opening of financial markets in emerging economies can increase investor participation in financial markets and improve the investors' financial market liquidity.

The openness of financial markets in emerging economies not only increase the liquidity of financial market, but also prompt financial institutions to engage in investment behaviors that involve further risks (Allen and Gale, 1999; Schneider and Tornell, 2004; Cubillas and González, 2014; Luo et al., 2016), which could aggregate the impact of a financial crisis on a regional scale (Bremus and Buch, 2017; Tornell and Westermann, 2005). This underlies the need to elucidate the influence of financial opening on local markets in emerging economies. The outcome of opening a financial market may depend on the structure of the emerging economy. Mayer and Sussman (2001) observe that information disclosure, accounting standards, and legal restrictions strongly affect the financial development of emerging economies. However, Levine (2002) and Claessens et al. (2002) argue that protection for the equity of shareholders in shallow stock markets is characteristically weak, and that opening financial markets can affect their equity. Given these contradictory arguments, the effects of opening financial markets on the financial development of emerging economies and financial market liquidity are yet to be defined.

The objective of the present study is to investigate the relationship between the openness of a financial market and its liquidity in an emerging economy, thereby clarifying the effects of financial opening on financial development. To fulfill the objective, this study endeavors to achieve the following: (1) to determine whether increases in cross-border trade improve financial market liquidity in emerging economies, thereby deepening their stock markets; (2) to measure the effects of macroeconomic growth, inflation rates, and the degree of financial market development on the relationship between financial market openness and financial market liquidity; and (3) to control the endogeneity of financial market openness on the basis of the research of Faria et al. (2007) and Faria and Mauro (2009). In comparison to previous studies, the present study contains two advantages: First, it employs panel data to examine the effects of financial market openness on financial market liquidity without the need to account for the influence of cross-border trade on financial market openness. Second, it employs instrumental variables to address the effect of endogeneity concerning the effect of financial market openness on financial market liquidity.

This paper provides several contributions to the related literature. First, in response to the call for research on the effect of financial openness in emerging markets on the domestic financial market liquidity, we find that higher the degree of the financial market openness enhances the domestic financial market liquidity, and the effect of the financial market openness on the emerging markets is more significance than the developed markets. Second, the empirical results show that emerging economies opening up their financial markets facilitates domestic financial reform, thereby reducing information asymmetry, adverse selection, and moral hazards within the markets, and subsequently improving market efficiency, liquidity, and the potential for attracting foreign investment. Finally, our results provide new insight into investment strategy, financing strategy, and policy decision for investors, corporation managers and governments to improve their investment performance and environments.

The remainder of this paper is structured as follows. Section 2 describes the data source, the definition of variables and empirical model. Section 3 presents empirical results regarding the effects of financial market openness on financial market liquidity in both emerging and developed economies. Section 4 concludes.

## 2. Data and methodology

### 2.1. Data

For exploring the relationship between financial market liquidity and openness, the selection criterion of sampled countries is based on whether the countries in Datastream and the International Financial Statistics database of the International Monetary Fund (IMF) have enough data to construct the all variables. Therefore, it yields a final sample of 11 countries (Australia, Canada, France, Italy, the U.K., China, the Czech Republic, Egypt, Indonesia, the Philippines, and Taiwan) after those sample selection procedures. Considering that the different degree of financial development across sampled countries (Levine, 2005), we further classify these countries into two groups: the developed economies (Australia, Canada, France, Italy, and the U.K.) and the emerging economies (China, the Czech Republic, Egypt, Indonesia, the Philippines, and Taiwan). In accordance with the number of sampled countries and the quantity of data collected from those countries, this study employs quarterly data spanning the period from the first quarter of 2001 to the fourth quarter of 2016. The data were obtained from Datastream and the International Financial Statistics database of the International Monetary Fund (IMF).

### 2.2. The definitions of variables

In this study, we use the Amihud (2002) illiquidity measure (*illiq*) and trading volume (*TV*) to be the proxy variables of the

financial market liquidity. In general, the bid-ask spread is conventionally applied as a proxy variable for market liquidity. However, the bid-ask spread does not reflect the trading volume that affects price variation. Considering that there is a significant negative relationship between trading volume and bid-ask spread, and that market liquidity increases with trading volume (Demsetz, 1968), we use the trading volume to measure the market liquidity.

The Amihud measure of illiquidity (*illiq*) reflects the effects of the stock market's price impact. In other words, the Amihud measure of illiquidity represents the extent of price variation for each transaction. Thus, the Amihud measure of illiquidity can be estimated using both market price and trading volume, as expressed in Eq. (1):

$$Liq_{i,t} = \frac{1}{D_t} \sum_{d=1}^{D_t} \frac{|R_{i,d}|}{Vol_{i,d}} \quad (1)$$

where  $D_t$  is the number of trading days per year;  $R_{i,d}$  is the daily market return, and  $Vol_{i,d}$  is the daily market turnover. Market turnover is estimated by multiplying the trading volume by trading price. Accordingly, the Amihud measure of illiquidity is subject to the total number of outstanding shares in a stock market.

Furthermore, we use the ratio of foreign assets to gross domestic product (*FOA*), the ratio of foreign liabilities to gross domestic product (*FOL*), and the ratio of the sum of foreign assets and foreign liabilities to gross domestic product (*FOAL*), and foreign direct investment (*FDI*) to measure the financial market openness (*FO*). The holding of foreign assets refers to the net holdings of FDI, equity investment, bond investment (comprising bonds and other investment portfolios), and derivative financial instruments. For comparing the effects of the accumulations of risk assets, risk-free assets, equities, and debts on financial markets, this study proposes "equity-related foreign assets and liabilities" and "loan-related foreign assets and liabilities" as measures of financial development. Equity-related foreign assets and liabilities consist of FDI and equity investment. Loan-related foreign assets comprise debt and reserve assets, whereas loan-related foreign liabilities consist of debt liabilities and derivative financial instrument liabilities. Moreover, we use per capita GDP (*GDP*), inflation rate (*CPI*), and total stock market value (*MV*) to be the control variables.

### 2.3. Model specification

In this paper, we use the panel regression to explore the effect of financial openness in emerging markets on the domestic financial market liquidity. However, applying this method may be affected by country characteristics and endogeneity between financial market openness and local stock market liquidity. Therefore, this study applies dummy variables to control national characteristics, and instrumental variables to address the endogeneity problem. Financial market liquidity is estimated by the following regression model:

$$Liq_{it} = \mu_i + \alpha'X_{it} + \gamma FO_{it} + \varepsilon_{it} \quad (2)$$

where the dependable variable  $Liq_{it}$  is the proxy variable for financial market liquidity in country  $i$  at period  $t$ ;  $X_{it}$  is the explanatory variable matrix, which includes control variables (per capita GDP, inflation rate, and total stock market value) in the equation for financial market liquidity;  $FO_{it}$  is the proxy variable for financial market openness in an emerging economy (comprising  $FOA_{it}$ ,  $FOL_{it}$ ,  $FOAL_{it}$ , and  $FDI_{it}$ ). All control variables are lagged to prevent the reverse causality.

When the endogeneity problem exists between financial market openness and liquidity, changes in financial market liquidity affects the market's openness. Based on the premise that a market with abundant natural resources comprised of well-run government organizations may attract substantial foreign investment, whereas a small size market comprised of well-run government organizations may afford more foreign liabilities; this study applies the percentage of foreign liabilities in GDP and the percentage of equities in net foreign liabilities as instrumental variables to control the endogeneity problem (Faria et al., 2007; Faria and Mauro, 2009).

## 3. Empirical results

### 3.1. Descriptive statistics

Table 1 illustrates the descriptive statistics of all variables. Regarding proxy variables for financial market liquidity, the means are

**Table 1**  
Description statistics.

	<i>illiq<sub>it</sub></i>	<i>TV<sub>it</sub></i>	<i>FOA<sub>it</sub></i>	<i>FOAL<sub>it</sub></i>	<i>FOL<sub>it</sub></i>	<i>FDI<sub>it</sub></i>	<i>GDP<sub>it</sub></i>	<i>MV<sub>it</sub></i>	<i>CPI<sub>it</sub></i>
Mean	3.3794	12.3797	13.5404	27.1776	13.6942	6.8286	7.5877	13.7290	0.7201
Max.	896.3538	18.8107	205.8302	390.1678	190.3912	12.9243	11.8988	17.2208	6.4000
Min.	-456.1416	6.6940	0.0006	1.3902	0.2946	0.0000	5.1327	9.6010	-3.1000
Std. Dev.	80.4432	2.5185	15.9076	34.6991	18.2143	2.7912	1.5243	1.2692	1.0001
Skew.	4.6495	-0.3851	5.0834	4.7915	4.5757	-0.8467	-0.2037	0.1473	1.2299
Kurt.	62.2426	2.6089	37.1503	36.9702	33.1427	3.1567	1.7990	4.3552	9.9602
J-B	71,449.4***	12.99***	25,841.5***	24,881.9***	19,963.2***	56.8***	31.7***	32.3***	1022.7***

Notes: \*, \*\*, and \*\*\* represents 10%, 5%, and 1% significance levels, respectively. J-B denotes the Jarque-Bera normal distribution test.

**Table 2**

Regression results of financial openness on market liquidity.

The sample periods covered from 2001 Q1 to 2016Q1. The empirical model described as follows:

$$Liq_{it} = \mu_i + \alpha X_{it} + \gamma FO_{it} + \varepsilon_{it}$$

where  $Liq_{it}$  is the Amihud illiquidity measure ( $illiq_{it}$ ) and denotes as the proxy variable of market liquidity.  $FO_{it}$  denotes the proxy variables of Financial Openness and measured by  $FOA_{it}$ ,  $FOAL_{it}$ ,  $FOL_{it}$  and  $FDI_{it}$ , respectively.  $X_{it}$  denotes the control variables including  $GDP_{it}$ ,  $MV_{it}$ , and  $CPI_{it}$ . \*, \*\*, and \*\*\* represents 10%, 5%, and 1% significance levels, respectively. The value in parentheses denotes the  $t$ -value.

$illiq_{it}$	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
C	0.5312* (1.9251)	0.2611 (0.8587)	0.3214 (1.1274)	2.6841*** (3.1684)	4.9349*** (3.6176)	8.2741*** (4.8413)	7.9367*** (3.4219)	9.5843*** (4.7468)
$FOA_{it}$	0.0009** (2.2599)				0.0048* (1.6858)			
$FOAL_{it}$		-0.0032* (-1.7816)				-0.0016** (-2.0981)		
$FOL_{it}$			-0.0113* (-1.7131)				-0.0006 (-0.6482)	
$FDI_{it}$				-0.2841*** (-3.3261)				-0.0612*** (-3.3831)
$GDP_{it}$					-0.1781*** (-3.4113)	-0.2817*** (-4.4125)	-0.2538*** (-3.3514)	-0.3587*** (-4.1593)
$MV_{it}$					-0.2727*** (-3.7422)	-0.4318*** (-5.8531)	-0.4019*** (-3.9882)	-0.4833*** (-4.8453)
$CPI_{it}$					-0.0425* (-1.8494)	-0.0513*** (-2.5745)	-0.0527* (-1.8648)	-0.0078 (-0.2691)
$R^2$	0.0208	0.0195	0.0224	0.0738	0.0114	0.0245	0.0225	0.0396
$adj.R^2$	0.0185	0.0172	0.0186	0.0715	0.0029	0.0159	0.0143	0.0321
$F - stat$	10.3172***	9.8153***	9.8461***	37.2184***	3.4821***	2.9512***	2.5297***	4.7636***

3.3794 for  $illiq_{it}$  and 12.3797 for  $TV_{it}$ , whereas the variances are 896.3538 for  $illiq_{it}$  and 18.8107 for  $TV_{it}$ .  $illiq_{it}$  exhibits more variability than does  $TV_{it}$ . Regarding proxy variables for financial market openness, the means are 13.5404% for  $FOA_{it}$ , 27.1776% for  $FOAL_{it}$ , 13.6942% for  $FOL_{it}$ , and 6.8286 for  $FDI_{it}$ , whereas the variances are 205.8302% for  $FOA_{it}$ , 390.1678% for  $FOAL_{it}$ , 190.3912% for  $FOL_{it}$ , and 12.9243 for  $FDI_{it}$ .  $FOA_{it}$  and  $FDI_{it}$  exhibits the highest and lowest variances, respectively. Regarding control variables, the means are 7.5877 for  $GDP_{it}$ , 0.7201 for  $CPI_{it}$ , and 13.7290 for  $MV_{it}$ , whereas the variances are 11.8988 for  $GDP_{it}$ , 6.4 for  $CPI_{it}$ , and 17.2208 for  $MV_{it}$ .

### 3.2. Financial market liquidity and openness

Table 2 presents the regression results of the relationship between all proxy variables for financial market openness and the Amihud measure of illiquidity ( $illiq_{it}$ ).  $illiq_{it}$  exhibits significant negative relationships with  $FOAL_{it}$ ,  $FOL_{it}$ , and  $FDI_{it}$ , but a significant positive one with  $FOA_{it}$ . Accordingly, as the openness of a financial market increases, so does its liquidity. The relationship between financial market openness and liquidity is also subject to macroeconomic development and financial development at a local level; therefore, this relationship is further analyzed with the input of per capita GDP, inflation rate, and total stock market value into the empirical model. As Table 2 illustrates,  $illiq_{it}$  remains significantly negatively related to  $FOAL_{it}$  and  $FDI_{it}$ ; thus, high financial market openness indicates high financial market liquidity.

Table 3 illustrates the regression results of the relationships between all proxy variables for financial market openness and trading volume ( $TV_{it}$ ).  $TV_{it}$  exhibits significant positive relationships with  $FOAL_{it}$ ,  $FDI_{it}$ , and  $FOA_{it}$ , concurring to the correlation result of  $illiq_{it}$ . After per capita GDP ( $GDP_{it}$ ), inflation rate ( $CPI_{it}$ ), and total stock market value ( $MV_{it}$ ) are added to the regression model, the four proxy variables for financial market openness exert further effects on, and are significantly positively related to,  $TV_{it}$ . Moreover, the significant effects of  $GDP_{it}$ ,  $CPI_{it}$ , and  $MV_{it}$  on financial market liquidity (Tables 2 and 3) indicate that both macroeconomic and financial development affect financial market liquidity. In summary, the results suggest that the liquidity of a financial market increases with its openness.

### 3.3. Emerging and developed economies

Because variations in financial market openness between emerging and developed economies exhibit different extents of influence on the liquidity of their respective financial markets, the sampled countries are categorized as emerging and developed economies. Table 4 tabulates the empirical results of the effects of financial market openness on financial market liquidity in developed economies. All proxy variables for financial market openness ( $FOA_{it}$ ,  $FOAL_{it}$ ,  $FOL_{it}$ , and  $FDI_{it}$ ) exert nonsignificant effects on  $illiq_{it}$ , whereas  $FOA_{it}$ ,  $FOAL_{it}$ , and  $FOL_{it}$  significantly affect  $TV_{it}$ . Thus, opening financial markets in developed economies contributes, albeit nonsignificantly, to financial market liquidity.

Table 5 presents the empirical results of the effects of financial market openness on financial market liquidity in emerging economies. All proxy variables for financial market openness significantly affect  $illiq_{it}$ ; in particular,  $FOAL_{it}$ ,  $FOL_{it}$ , and  $FDI_{it}$  exert significant negative effects on  $illiq_{it}$ . Similarly, all four proxy variables for financial market openness exert significant positive effects

**Table 3**

Regression results of financial openness on market liquidity.

The sample periods covered from 2001 Q1 to 2016Q1. The empirical model described as follows:

$$Liq_{it} = \mu_i + \alpha X_{it} + \gamma FO_{it} + \varepsilon_{it}$$

where  $Liq_{it}$  is the market trading volume ( $TV_{it}$ ) and denotes as the proxy variable of market liquidity.  $FO_{it}$  denotes the proxy variables of financial openness and measured by  $FOA_{it}$ ,  $FOAL_{it}$ ,  $FOL_{it}$  and  $FDI_{it}$ , respectively.  $X_{it}$  denotes the control variables including  $GDP_{it}$ ,  $MV_{it}$ , and  $CPI_{it}$ . \*, \*\*, and \*\*\* represents 10%, 5%, and 1% significance levels, respectively. The value in parentheses denotes the  $t$ -value.

$TV_{it}$	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
C	12.5819*** (405.1202)	12.8203*** (431.5128)	12.1238*** (434.9876)	12.8306*** (225.0148)	20.9632*** (58.4562)	20.2145*** (58.8417)	20.8423*** (57.9873)	25.1361*** (52.7746)
$FOA_{it}$	0.0068*** (7.2515)				0.0141*** (9.6634)			
$FOAL_{it}$		0.0018*** (4.5921)				0.0068*** (9.8541)		
$FOL_{it}$			0.0012 (1.4368)				0.0113*** (8.9851)	
$FDI_{it}$				0.0127** (2.2613)				0.4112*** (23.8792)
$GDP_{it}$					-0.5815*** (-28.2148)	-0.5685*** (-26.1864)	-0.5682*** (-27.2541)	-0.9234*** (-27.5147)
$MV_{it}$					-0.3014*** (-15.4125)	-0.2977*** (-15.5267)	-0.2922*** (-16.6819)	-0.6114*** (-31.2563)
$CPI_{it}$					0.0926*** (3.7845)	0.0911*** (3.8184)	0.0889*** (3.6418)	0.1082*** (2.9853)
$R^2$	0.0452	0.0047	0.0091	0.7302	0.7252	0.7212	0.8129	0.0411
$adj.R^2$	0.0431	0.0029	0.0072	0.7211	0.7229	0.7184	0.8111	0.0354
$F - stat$	22.9645***	3.9851*	4.3528**	308.4483***	308.4156***	304.4562***	505.4496***	4.3251***

**Table 4**

Regression results of developed markets.

The sample periods covered from 2001 Q1 to 2016Q1. The empirical model described as follows:

$$Liq_{it} = \mu_i + \alpha X_{it} + \gamma FO_{it} + \varepsilon_{it}$$

where  $Liq_{it}$  denotes as the proxy variable of market liquidity which includes the market trading volume ( $TV_{it}$ ) and the Amihud illiquidity measure ( $illiq_{it}$ ).  $FO_{it}$  denotes the proxy variables of financial openness and measured by  $FOA_{it}$ ,  $FOAL_{it}$ ,  $FOL_{it}$  and  $FDI_{it}$ , respectively.  $X_{it}$  denotes the control variables including  $GDP_{it}$ ,  $MV_{it}$ , and  $CPI_{it}$ . \*, \*\*, and \*\*\* represents 10%, 5%, and 1% significance levels, respectively. The value in parentheses denotes the  $t$ -value.

Dependent variable	$illiq_{it}$				$TV_{it}$			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
C	-0.0632 (-0.6746)	-0.0622 (-0.6854)	-0.0612 (-0.6986)	-0.0413 (-0.5127)	10.0014*** (13.6412)	10.0587*** (13.3619)	10.1257*** (13.6472)	7.1371*** (8.8761)
$FOA_{it}$	-0.0001 (-0.6672)				0.0076*** (4.4849)			
$FOAL_{it}$		-0.00001 (-0.6711)				0.0042*** (5.0214)		
$FOL_{it}$			-0.00001 (-0.6143)				0.0076*** (5.0941)	
$FDI_{it}$				0.0003 (1.1227)				-0.0025 (-0.2971)
$GDP_{it}$	-0.0009 (-0.0829)	-0.0008 (-0.0748)	-0.0008 (-0.0661)	-0.0008 (-0.0752)	-0.6541*** (-10.3317)	-0.6367*** (-10.1185)	-0.6367*** (-10.2134)	-0.7568*** (-15.5791)
$MV_{it}$	0.0049*** (2.8863)	0.0049** (2.8284)	0.0046** (2.3119)	0.0028 (1.0925)	0.6284*** (7.3698)	0.6017*** (7.1945)	0.6036*** (7.2841)	0.9317*** (11.8964)
$CPI_{it}$	0.0077* (1.9079)	0.0074* (1.8174)	0.0073* (1.7463)	0.0080* (1.7670)	0.0102 (0.2137)	0.0108 (0.3116)	0.0113 (0.3216)	0.0176 (0.3743)
$R^2$	0.0050	0.0049	0.0046	0.0047	0.6497	0.6414	0.6369	0.6286
$adj.R^2$	-0.0141	-0.0143	-0.0147	-0.0142	0.6425	0.6357	0.6317	0.6218
$F - stat$	0.2567	0.2582	0.2529	0.2601	90.5225***	92.2556***	92.5794***	91.0601***

on  $TV_{it}$ . Both of these findings indicate that in emerging economies, the more open financial markets are, the more mobile they are.

On the basis of all the empirical findings, opening up financial markets fosters financial liberalization, attracts capital from abroad, and improves market liquidity and capital efficiency. This outcome is more noticeable in emerging economies than in developed ones. As such, opening financial markets in emerging economies may engender the replacement of inefficient financial institutions with more efficient ones, thereby furthering domestic financial reform; reducing information asymmetry, adverse selection, and moral hazards; and attracting foreign investment. The inflow of substantial capital from abroad enables financial markets in emerging economies to become more mobile and efficient.

Table 5

Regression results of emerging markets.

The sample periods covered from 2001 Q1 to 2016Q1. The empirical model described as follows:

$$Liq_{it} = \mu_i + \alpha X_{it} + \gamma FO_{it} + \varepsilon_{it}$$

where  $Liq_{it}$  denotes as the proxy variable of market liquidity which includes the market trading volume ( $TV_{it}$ ) and the Amihud illiquidity measure ( $illiq_{it}$ ).  $FO_{it}$  denotes the proxy variables of financial openness and measured by  $FOA_{it}$ ,  $FOAL_{it}$ ,  $FOL_{it}$  and  $FDL_{it}$ , respectively.  $X_{it}$  denotes the control variables including  $GDP_{it}$ ,  $MV_{it}$ , and  $CPI_{it}$ . \*, \*\*, and \*\*\* represents 10%, 5%, and 1% significance levels, respectively. The value in parentheses denotes the t-value.

Dependent variable	$illiq_{it}$				$TV_{it}$			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
C	5.8452*** (2.8853)	6.5311** (2.2325)	1.9372 (1.3029)	7.7468*** (2.4755)	22.8849*** (24.2971)	22.1236*** (22.5983)	21.0682*** (22.6518)	29.7968*** (39.3527)
$FOA_{it}$	0.1758*** (3.0012)				0.0694*** (2.8864)			
$FOAL_{it}$		-0.0495*** (-2.6481)				0.0267* (1.7236)		
$FOL_{it}$			-0.0312** (-1.9581)				0.1332*** (6.7168)	
$FDL_{it}$				-0.1286*** (-3.2763)				0.7567*** (11.6643)
$GDP_{it}$	-0.5853 (-1.3981)	-0.5618* (-1.7966)	-0.0319 (-0.6217)	-0.4239*** (-2.3681)	-2.7521*** (-33.9564)	-2.6018*** (-23.2297)	-2.4125*** (-20.1112)	-2.8977*** (-36.3671)
$MV_{it}$	-0.2494 (-1.1367)	-0.2297*** (-2.4136)	-0.1196 (-1.3971)	-0.3517*** (-2.6538)	0.3899*** (5.1237)	0.5617*** (7.9637)	0.5468*** (9.8521)	-0.1799*** (-2.9971)
$CPI_{it}$	0.0652 (0.6374)	-0.0959 (-1.5217)	0.0187 (0.5671)	-0.0327 (-0.6986)	0.2847*** (2.9687)	0.2286*** (2.3556)	0.2132*** (2.4117)	0.3163*** (4.1257)
$R^2$	0.0143	0.0138	0.0135	0.0211	0.6867	0.6668	0.6972	0.7781
$adj.R^2$	0.0118	0.0126	0.0127	0.0149	0.6815	0.6612	0.6915	0.7742
$F-stat$	3.8963**	5.9674***	4.8413***	7.7786***	137.6982***	127.2867***	145.0159***	227.6985***

#### 4. Conclusions

Capital market globalization has compelled many countries to open up their financial markets in anticipation of the foreign investment required to improve market liquidity. This study samples 11 developed and emerging economies to examine the effects of financial market openness on market liquidity. To ensure the robustness of the study, two proxy variables are applied to measure financial market liquidity, with a further four to estimate financial market openness. The main empirical findings are as follows: First, financial market openness is significantly positively related to financial market liquidity, suggesting that opening up financial markets renders markets more mobile. Second, the effects of financial market openness on financial market liquidity are more significant in emerging economies than in developed ones. Accordingly, emerging economies opening up their financial markets facilitates domestic financial reform, thereby reducing information asymmetry, adverse selection, and moral hazards within the markets, and subsequently improving market efficiency, liquidity, and the potential for attracting foreign investment.

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