ECONOMIC RESEARCH FORUM
منتدى البحوث الاقتصادية
2011

working paper series

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Working Paper No. 655

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December 2011

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First published in 2011 by
The Economic Research Forum (ERF)
21 Al-Sad Al-Aaly Street
Dokki, Giza
Egypt
www.erf.org.eg

Abstract

In the context of stock markets, the financial economics literature has developed the concept of "operational efficiency" which is known to be essential in performing their economic role. Operationally efficient (liquid) markets allow investors to get their orders executed quickly and as cheaply as possible. It is common knowledge that the recent financial crisis has led to a collapse in world stock markets. For example, the market capitalization of the Abu Dhabi Stock Exchange (ADSE) and the Dubai Financial Market (DFM) have fallen from $121,128 million and $138,179 million in 2007 to $80,201 million and $58,095 million by the end of 2009. As expected, this collapse in both markets has some serious implications to the liquidity cost of the ADSE and DFM. This research provides answers to two main questions. First, what is the liquidity cost that prevails in the Abu Dhabi and Dubai capital markets? Second, has the March 2010 change (reduction) in the minimum tick size in the DFM led to an improvement in its operational efficiency? Based on a total number of 22 listed firms on the DSM and 22 listed firms on the ADSE, and daily data during the period 1/10/2009–1/8/2010, the empirical results indicate that liquidity costs on both the DFM and ADSE are relatively high. In addition, the results clearly indicate that the reduction in the minimum tick size of listed firms on the Dubai capital market has led to its desired objective (reducing the impact of stock prices on their liquidity cost).

ملخص

في سياق أسواق الأوراق المالية، استحدثت أدبيات الاقتصاد المالي مفهوم "الكفاءة التشغيلية" المعروف أساسا للتنويه عن مستوى الأداء الاقتصادي للأسواق . حيث تتيح الأسواق العاملة بكفاءة (السيولة) للمستثمرين لتنفيذ طلباتهم بصورة اسرع وبأقل تكاليف ممكنة. ومن المعروف أن الأزمة المالية الأخيرة أدت إلى "انهيار" أسواق الأسهم العالمية. فعلى سبيل المثال، انخفضت القيمة السوقية لسوق أبو ظبي للأوراق المالية (ADSE) وسوق دبي المالي (DFM) من 121.128 مليون دولار و 138.179 $ مليون في عام 2007 إلى 80.201 مليون دولار و 58.095 $ مليون بحلول نهاية عام 2009. و كما هو متوقع ، أدى هذا الانهيار في كل من الأسواق إلى بعض الآثار الخطيرة على تكلفة السيولة في سوق دبي المالي و سوق أبو ظبي للأوراق المالية. و يقدم هذا البحث الإجابة على سؤالين أساسيين. أولا ، ما هي تكلفة السيولة التي تسود في أسواق رأس المال بأبو ظبي ودبي ؟ ثانيا ، هل أدى تغير (تخفيض) سعر صرف مارس 2010 في سوق دبي المالي إلى تحسن في كفاءة "عملياته"؟ و استنادا إلى إجمالي الشركات ال22المدرجة في سوق أبو ظبي للأوراق المالية ، وال 22 شركة المدرجة في سوق دبي المالي و البيانات اليومية خلال الفترة من 2009/10/1— 2010/8/1، تشير النتائج الاولية إلى أن تكاليف السيولة في سوق دبي المالي و سوق أبو ظبي للأوراق المالية مرتفعة نسبيا و على حد سواء. و بالإضافة إلى ذلك ، فإن النتائج تشير و بوضوح إلى أن الانخفاض في حجم علامة الحد الأدنى للشركات المدرجة في سوق المال في دبي أدى إلى الهدف 'المرجو و هو (الحد من تأثير ارتفاع أسعار الأسهم على تكلفة السيولة لديها).

1. Introduction

Following the classical arguments by Schumpeter (1934) and Robinson (1952), numerous theoretical and empirical papers have examined the role of financial development (the establishment and expansion of financial intermediaries, financial securities and stock markets) in economic growth and development. Indeed, financial intermediaries (banks) and capital markets (stock exchanges) are expected to provide services which are conducive to economic growth. For example, they improve information and transaction costs, promote savings and improve their efficient investment allocation, spread risk, and provide liquidity.

The theoretical predictions of the financial development and economic growth nexus are well supported by many cross-country, industry-level, and firm-level research papers[1]. Based on this literature, one can state that the role of finance in economic growth has become a stylized fact. This is why the literature has shifted its attention to other related issues such as the determinants of financial development[2], determinants of the type of financial system (bank-based or market-based[3]) and the development of new measures of financial development (such as long-term debt and bank efficiency) and their impact on economic growth[4].

As far as the economic importance of stock markets is concerned, it is interesting to note that "in roughly the last decade, stock exchanges have opened in some of the least likely places, from Azerbaijan to Zambia. This could be partly due to an influential body of theoretical and empirical literature which has established a positive correlation between the level of financial development and economic growth," (Minier 2009). Theoretically, there are two main arguments that relate stock market development to a country's investment and economic growth[5]. First, by improving liquidity, stock markets increase the availability of funds to finance long-term capital investment projects (Levine 1991 and Bencivenga et al. 1995). Second, liquid stock markets allow investors to realize the benefits of diversification and encourage investors to shift their investment portfolios from safe securities that offer low returns to riskier securities with high returns (Greenwood and Jovanovic 1990 and Obstfeld 1994).

Relative to the above-mentioned roles of the stock market, it is useful to note that the financial economics literature contains numerous empirical papers which examine the determinants of firm growth in terms of, for example, fixed investment[6]. Indeed, the number of these papers is too large to review even in a specialized paper. However, some of the more recent works include Aivazian et al. (2005), Hanazaki and Liu (2007), Yuan and Motohashi (2008), Bokpin and Onumah (2009), Xiao (2009), Bruckner (2010), Duchin et al. (2010), Piris (2010), and Umutlu (2010). Typically, these researchers regress firm-level fixed investment on a number of explanatory variables including Tobin's q (market value of equity

[1]For good surveys of financial development and economic growth literature, see Levine (2004), Ang (2008), and Demirguc-Kunt and Levine (2008). For some recent papers which examine the impact of financial development on economic growth in the Middle East and North Africa (MENA) region, see, for example, Ben Naceur and Ghazouani (2007) and Abu-Bader and Abu-Qarn (2008). For more recent papers which examine financial development and growth, see Blanco (2009), Colombage (2009), Antonios (2010), and Halkos and Trigoni (2010).

[2]See, for example, Law and Habibullah (2009), Andrianaivo and Yartey (2010) and Pinto et al. (2010). In addition, the determinants of stock market development in the MENA region is examined by Ben Naceur et al. (2007) and Cherif and Gazdar (2010).

[3]See, for example, Aggarwal and Goodell (2009).

[4] See, for example, Beck et al. (2009), Hasan et al. (2009) and Koetter and Wedow (2010).

[5]For a good discussion of the theoretical link between stock markets and resource allocation and growth see, for example, Capasso (2006).

[6]Some researchers measure firm growth in terms of employment or sale growth. Some of the recent papers include Saeed (2009) and Huynh and Petrunia (2010).

plus book value of debt to book value of total assets), cash flow, sales revenue, leverage, and stock liquidity.

Realizing the economic importance of financial development in general, and securities markets in particular, most of the Arab economies boast the existence of corporations listed on their respective stock exchanges. For example, in Abu Dhabi and Dubai, the ADSE and DFM were established, respectively, in 2000. Concerning the DFM, it is worth noting that on the 11th of March 2010, the DFM has changed its minimum tick size. In more specific terms, the new regulation enables traders to apply the three decimal tick size system on securities with a market value below AED 1. Naturally, this allows investors to trade in these securities with fractions of one Fills.

In the context of stock markets, the financial economics literature has developed a myriad of concepts which are known to be essential in performing their economic role. At the forefront of these concepts is operational efficiency. Operationally efficient (liquid) stock markets allow traders to get their orders executed as quickly (immediacy) and as cheaply as possible. In other words, liquidity refers to the ease with which buyers and sellers of securities promptly get their orders executed with minimal impact on the price.

It is common knowledge that liquidity is a major concern for those who trade financial securities and those who create, manage and regulate trading infrastructures. Indeed liquidity has proved to be relevant in a number of issues. For example, the published literature indicates a negative relationship between stock returns and liquidity. This observation implies that companies with more liquid stocks have lower costs of capital (Amihud and Mendelson 1986; Brennan and Subrahmanyam 1996; Easley et al. 2002; Pastor and Stambaugh 2003; Acharya and Pedersen 2005; Hasbrouck 2005). Moreover, it is shown that companies with more liquid stocks incur lower investment banking fees and hence lower cost of capital (Butler et al. 2005; and Mantecon and Poon 2009). In addition, it is stated that trading costs and liquidity "are often cited as important factors in the international competition for order flow, and might shed light on the relative merits of different market designs."[7] Finally, it is stated that "ultimately, market design and regulation shape the degree of investor participation, the competitiveness of financial markets, economic growth, and social welfare," (Degryse 2009).

Given their economic importance, one should not be surprised to learn that the issue of stock markets' liquidity has attracted numerous papers which examine a number of specific issues. For example, Bourghelle and Declerck (2004), Aitken and Comerton-Forde (2005), Ahn et al. (2007), and Ascioglu et al. (2010) have examined the impact of a reduction in the minimum tick size on transaction costs In addition, the impact of improvements in legal and political institutions on the cost of liquidity in financial markets[8], impact of liquidity on the capital structure decisions of companies[9], impact of stock splits on liquidity[10], impact of liquidity on firm value[11], impact of financial liberalization on stock market liquidity[12], and the impact of cross-listing on liquidity[13] and on information asymmetry[14] have attracted a lot of research

[7] Choe et al. (1999) argue that in emerging markets, large orders often result in substantial price movements raising concerns that foreign capital flows (hot money) might destabilize domestic markets. In addition, it is argued that high trading costs in emerging markets might induce corporations to cross-list their stocks in more liquid and developed stock markets (Domowitz 2001).

[8] See, for example, Eleswarapu and Venkatataman (2006).

[9] See, for example, Lipson and Mortal (2009) and Frieder and Martell (2006).

[10] See, for example, Pavabutr and Sirodom (2008, 2010).

[11] See, for example, Fang et al. (2009).

[12] See, for example, Lee and Wong (2009).

[13] See, for example, Berkman and Nguyen (2010.

effort. Finally, many papers show that specialist markets are associated with a lower cost of liquidity (bid-ask spread) when compared with other market structures[15].

In addition to the above-mentioned research issues, the determinants of liquidity cost (bid-ask spread) have attracted a lot of research attention. Following the classical works by Demsetz (1968), Tinic (1972), Tinic and West (1974), Benston and Hagerman (1974), and Stoll (1978) and based on the order execution and inventory control model provide by Stoll (2000), numerous papers examine the underlying relationship between liquidity and stock characteristics. In other words, these works regress a measure of liquidity cost on a vector of characteristics including stock volatility (risk), trading volume (liquidity), firm size, stock price, foreign ownership, and others[16]. Some of these works include Benston and Hagerman (1974), Chiang and Venkatesh (1988), Glosten and Harris (1988), Sarin et al. (1997), Heflin and Shaw (2000), Attig et al. (2003), Naes (2004), Jacoby and Zheng (2006), Zheng and Zhang (2006), Blasco et al. (2008), Frino et al. (2008), Brockman et al. (2009), Ree and Wang (2009), Agudelo (2010), Chai et al. (2010), Chung et al. (2010), Chung and Hrazdil (2010), and Jacoby and Zheng (2010).

Against the above background, the objective of this paper is to provide answers to the following four questions:

(1) What is the liquidity cost that prevails in the ADSE and DFM?

(2) Has the March 2010 change in the minimum tick size in the DFM led to an improvement in its operational efficiency?

(3) How does liquidity cost in these two Arab markets compare with other advanced and emerging stock markets?

(4) Are main-stream determinants of liquidity cost applicable to these Arab stock markets?

(5) Based on the results of the empirical analyses, what policy recommendations can be suggested to improve the liquidity (operational efficiency) of listed securities on the ADSE and DFM in particular and other Arab stock markets in general?

Relative to the above-mentioned objectives, it is useful to note—to the best knowledge of the authors—that these markets have not been investigated in terms of their liquidity cost and determinants. Moreover, the change in the minimum tick size is unique in Arab stock markets and given the importance of operational efficiency, our examination of the impact of this new regulation on the operational efficiency of the DFM can be generalized to other Arab stock markets.

2. The Abu Dhabi Stock Exchange and Dubai Financial Market

In Tables 1 to 6, we report some basic information about the ADSE and the DFM. Based on the reported figures, the following observations can be made. First, the ADSE and the DFM were established in 2000. As expected, both of these markets reflected some modest initial figures. For example, in 2003 the ADSE and DFM had a total of 30 and 13 listed firms respectively. By the end of 2009, the total number of listed firms on each of these markets had increased to 67 (Table 1).

Second, a look at tables 2 and 3 reveals the fact that most of the listed firms belong to the service sector. Indeed, this is also reflected in the market capitalization and trading volume proportions. For example, in the Abu Dhabi market, the telecommunication sector makes up about 36.7 percent of the capitalization of the whole market and the real estate sector makes up about 45.7 percent of the market's trading volume. Similarly, 50.1 percent of Dubai

[14] See, for example, Heibatollah and Zhou (2008).

[15] See, for example, Frino et al. (2008).

[16] For a review of this literature, see Stoll (2002).

market's capitalization is accounted for by the utilities sector. In addition, the real estate sector accounted for about 57.8 percent of the market's trading volume.

Third, notwithstanding the causes of the present financial crisis and global recession[17], the underlying fact is that the world economy has collapsed into steep recession in the 4th quarter of 2008. Indeed, it is estimated that the year 2008 had witnessed a global drop in real GDP by 6 percent and many forecasts foresee the global recession lasting through 2009 and perhaps 2010[18]. Moreover, the 2008 global economic recession has led to a collapse in global stock prices. For example, the 2007 market capitalization of the ADSE, which was equal to$121,128 million, dropped to $68,810 million by the end of 2008. Similarly, the capitalization of the DFM decreased from a total value of $138,179 million in 2007 to $63,099 million by the end of 2008. This is why the ratio of market capitalization to Gross Domestic Product (GDP) in both of these markets reflected some marked decrease in 2008 (Table 4).

Fourth, similar to most emerging stock markets, the capital markets in the United Arab Emirates (UAE) are highly concentrated in terms of market capitalization and trading volume. For example, the capitalization of the largest ten listed firms account for 55 percent and 50.8 percent of the ADSE and DFM respectively. Similarly, 66.6 percent and 68.4 percent of the trading volume of the ADSE and DFM is accounted for by only 5 listed firms (Table 5).

3. Data, Methodology and Empirical Results

The market-making mechanism that exists in the ADSE and DFM is order-driven. All investors must deal with brokers and their orders are prioritized (for execution) according to price and time. In other words, by submitting successive buy and sell orders, traders provide liquidity for other participants who demand immediacy by placing counter market orders. In contrast to other markets such as in the USA, these markets do not have designated liquidity providers (market-makers) to stabilize stock prices by trading on their own accounts.

The basic data set which is used in this paper is obtained from each market's daily report. This report publishes a number of measures including the number of traded shares, trading volume, number of transactions, closing prices, highest and lowest recorded transaction prices, and the highest (lowest) prevailing bid (ask) prices at the close of each trading day.

At the close of each trading, both markets publish the prevailing highest and lowest buy price and sell price. These prices are for counter orders (buy and sell) that did not get executed at the end of each trading day. The difference between these two prices can be used as a measure of liquidity cost. While these prices are not published continuously during trading days, one can argue that the difference between the closing highest and lowest bid and ask prices at the end of each trading day is a good measure of liquidity cost. This is due to the fact that the arrival times of the closing bid and ask prices are random in nature. In other words, over a time period, the daily closing best bid and ask prices reflect a good measure of liquidity cost.

Based on the daily closing bid and ask prices during the period 1/10/2009–1/8/2010 (a total of 10 months), we compute the following daily measures of the spread for a total of 22 listed firms on the DFM and 22 listed firms on the ADSE.

1: $Spread_{i,t} = [(Ask_{i,t} - Bid_{i,t}) / Bid_i)] * 100$

where $Spread_i$ refers to the percentage bid-ask spread of stock i at the end of the trading day t, Ask is the ask quote and Bid is the bid price at the end of day t.

[17] For a review of the causes of the financial crisis, see Felton and Reinhart (2008) and Taylor (2009).

[18] For a good forecast of the world economy in 2009 and 2010, see Mussa (2009).

2: $Spread_{i,t} = s / \sqrt{Ask_{i,t}\ Bid_{i,t}}$

where s indicates the difference between the bid and ask quotes, and Ask and Bid are defined as above.

3: $Spread_{i,t} = [(Ask_{i,t} – Bid_{i,t}) / Q_i)] * 100$

where Qi refers to the midpoint between the bid and ask prices of stock i.

In addition to the above, and based on the international literature and the availability of data, we use trading frequency, stock price, price volatility, ownership structure, and company size to explain the cross-sectional variations in the bid-ask spread. In other words, we estimate the following regression model:

$$(SPREAD_{i,t}) = \alpha_0 + \alpha_1 \ln(VOL_{i,t}) + \alpha_2 \ln(PRICE_{i,t}) + \alpha_3(RISK_{i,t})$$

$$+ \alpha_4 \ln(SIZE_{i,t}) + \alpha_5(OWN_{i,t}) + \varepsilon_{i,t} \qquad (1)$$

where SPREAD is the bid-ask spread; VOL is the trading volume or number of contracts; PRICE is equal to one plus the natural logarithm of stock price; RISK is the difference between the highest and lowest price divided by the closing price; SIZE is defined as the market value of the firm's equity; OWN is the proportion of the shares which are owned by those who own 5 percent of the shares or more; and ln stands for the natural logarithm.

The chosen stocks are the most active in the market. In other words, these shares are chosen based on the fact that they had daily transactions and daily closing bid and ask prices for at least 75 percent of the days during the 10 month period.

As far as the change in the minimum tick rule in the DFM is concerned, the specified time period (1/10/2009–1/8/2010) enables us to measure the daily bid-ask spread for a total of 5 months before and after the change in the minimum tick rule. In other words, to the above-mentioned model (1), we add a dummy variable to account for the change in the minimum tick rule. In addition, we estimate model 1 based on the first sub-period (5 months) and the second sub-period (5 months) separately. Indeed, if the coefficient of the stock price in the second sub-period is lower than that in the first sub-period, this indicates that the change in the minimum tick rule has led to a reduction in liquidity cost.

We report in tables 6-9 some basic information about the spread measures and the independent variables for both the ADSE and DFM. Based on the reported results, three observations can be made.

First, the mean values of the spread measures are relatively high. For example, it can be seen (table 6) that the mean values of the spread are equal to 1.561 percent and 1.558 percent in the Abu Dhabi and Dubai capital markets respectively. These values are much higher than, for example, the 0.741 percent and 0.689 percent reported by Frino et al. (2008), 1.268 percent reported by Espinosa et al. (2008), 0.36 percent reported by Brockman et al. (2009), and the 0.36 percent reported by Chung et al. (2010[19]). The same observation applies to the other measures of the spread (Table 8).

Second, as far as the both markets are concerned, the mean values of the spread measure in the second sub-period (table 7) are higher than those which prevailed in the first sub-period. This observation is expected given the fact that the mean values of stock prices were lower in the second sub-period (table 9). However, what is interesting here is the impact of stock price

[19] It is useful to note that Frino et al. (2008) examine the Italian market where stocks that traded in the auction market switched to a specialist market. The results indicate a decrease in the cost of trading from 0.714 percent to 0.689 percent. The papers by Espinosa et al. (2008), and Brockman et al. (2009) and Chung et al. (2010) examine the Madrid Stock Exchange and the New York Stock Exchange respectively.

on liquidity cost in the Dubai market following the change (reduction) in the minimum tick size. This point will be discussed later on.

Finally, the two markets differ in some of the independent variables. For example, the reported results (table 9) reveal that the risk measure in the DFM is higher than that in Abu Dhabi market. In addition, it seems that the ownership structure of listed firms on the Dubai market is more concentrated than in the Abu Dhabi market.

The estimation results of model 1 are reported in Tables 10 to 12. Again, based on these results, we can put forward two main sets of observations. The first observation is about the impact of stock price on liquidity cost. The second observation is about the other independent variables. What follows is a discussion of these observations. First, the coefficient of price (PRICE) is consistently negative and significant at the 1 percent level. This indicates that stocks with higher prices have, on average, lower liquidity cost. While this observation is expected, it is interesting to note that, as far as the DFM is concerned (table 10), the coefficient of the dummy variable is negative and significant and implies that the reduction in the minimum tick rule has led to the desired objective (reducing liquidity cost). In addition, it is useful to compare the Abu Dhabi and Dubai markets in terms of the coefficient of this variable (PRICE). For example, the ADSE's results show that the coefficients of the stock price (PRICE) in the first and second sub-periods are equal to -0.375 and -0.345 respectively (Table 11). The corresponding coefficients for the DFM (Table 12), on the other hand, are equal to -0.349 (first sub-period) and -0.091 (second sub-period). Clearly, this indicates that the introduction of the new minimum tick rule has led to a reduction in the impact of stock prices (low) on liquidity cost.

Second, as far as the remaining independent variables are concerned, on average, they have the expected signs. For example, the impact of trading volume (VALUE) on the bid-ask spread is negative and this indicates that illiquid stocks tend to have wider bid-ask spreads[20]. The coefficient of risk is consistently positive and significant. Indeed, when volatility (risk) is low, one should expect narrower bid-ask spreads. The coefficient of firm size is also consistently positive and significant. This result is surprising because one would have expected that larger firms tend to be older and better known and hence their bid-ask spreads tend to be narrower than smaller and less-known firms. However, the fact that the market has not been established for a long time, this argument is probably not relevant. Finally, while the impact of the ownership structure of firms on the bid-ask spread is negative, the extent of this impact is lower in the Dubai market. This is probably due to the fact that firms which are listed on the Dubai market are more concentrated in their ownership structure (Table 9).

4. Summary and Conclusions

The theoretical predictions of the financial development and economic growth nexus are well supported by many cross-country, industry-level, and firm-level research papers. This is why stock markets have attracted numerous papers which examine various aspects of their performance and these include, for example, the determinants of operational efficiency (liquidity cost), impact of reducing the minimum tick size on liquidity cost, impact of stock splits on liquidity, impact of financial liberalization on stock market liquidity, impact of cross-listing on liquidity, impact of liquidity on the capital structure decisions of companies, firm value, and on information asymmetry. In addition, many papers show that specialist markets are associated with a lower cost of liquidity (bid-ask spread) when compared with other market structures.

This paper tried to provide answers to five questions: (1) What is the liquidity cost that prevails in the ADSE and DFM? (2) Has the March 2010 change in the minimum tick size in

[20] Using the natural logarithm of the number of contracts produced similar results.

DFM led to an improvement in the operational efficiency of the DFM? (3) How does liquidity cost in these two Arab markets compare with other advanced and emerging stock markets? (4) Are main-stream determinants of liquidity cost applicable to these Arab stock markets? (5) Based on the results of the empirical analyses, what policy recommendations can be suggested to improve the liquidity (operational efficiency) of listed securities on the ADSE and DFM in particular, and other Arab stock markets in general?

Based on a total number of 22 listed firms on the DSM and 22 listed firms on the ABSM and the time period 1/10/2009–1/8/2010, the empirical results indicate that liquidity costs on these two Arab capital markets are relatively high. This conclusion warrants some serious examination, and based on the international literature, the introduction of market-makers (specialists) might be the remedy. In addition, while well-known determinants of liquidity cost are applicable to the DSM and ABSM cases, the results clearly indicate that the stock market crash has led to an increase in liquidity cost. Moreover, the fact that wide (and increasing) bid-ask spreads have some serious implications on investment management (risk of stocks) and corporate finance (cost of equity capital and firm value), this observation must be dealt with, and based on the international literature, it can be argued that the management of the ABSM must consider either a reduction in the minimum tick or, in the case of the DSM, encourage listed firms whose prices have fallen by a large proportion to consider a reverse stock split. Finally, it can be argued that the results of this paper are applicable to other Arab stock markets. Indeed, this observation is based on the fact that all Arab markets have adopted the same market-making mechanism.

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Table 1: The ADSE and DFM: Some Recent Developments

Year	Number of Listed Firms		Market Capitalization (Million US$)	
	ADSE	DFM	ADSE	DFM
2003	30	13	30,362	14,284
2005	59	30	132,412	111,992
2007	64	55	121,128	138,179
2008	65	65	68,810	63,099
2009	67	67	80,201	58,095

Source: Arab Monetary Fund

Table 2: Sector Distribution of Capitalization and Trading Volume Abu Dhabi Market (2009)

Sector	No. of Firms	Capitalization Ratio	Traded Volume Ratio
Banking	17	0.361	0.147
Insurance	15	0.044	0.040
Real Estate	3	0.070	0.457
Consumer	9	0.028	0.019
Construction	10	0.037	0.061
Industrial	4	0.014	0.001
Telecommunication	4	0.367	0.008
Health Care	2	0.009	0.001
Energy	3	0.069	0.265

Table 3: Sector Distribution of Capitalization and Trading Volume Dubai Market (2009)

Sector	No. of Firms	Capitalization Ratio	Traded Volume Ratio
Banking	12	0.127	0.073
Consumer	5	0.003	0.002
Financial Services	14	0.087	0.184
Insurance	13	0.024	0.041
Materials	4	0.068	0.002
Real Estate	11	0.101	0.578
Telecommunication	2	0.029	0.008
Transportation	4	0.061	0.098
Utilities	1	0.501	0.022

Table 4: The ADSE and DFM: The Secondary Market

Year	Capitalization to GDP		Traded Value to Capitalization	
	ADSE	DFM	ADSE	DFM
2003	0.341	0.161	0.033	0.072
2005	0.987	0.835	0.071	0.240
2007	0.584	0.666	0.394	0.748
2008	0.263	0.241	0.917	1.317
2009	0.349	0.253	0.234	0.813

Source: Arab Monetary Fund

Table 5: Top Ten Companies by Capitalization and Trading Volume to Total Market (2009)

Market	Capitalization	Trading Volume
ADSE	55.0	66.6
DFM	50.8	68.4

Source: Arab Monetary Fund

Table 6: Estimates of the Spread: Some Basic Statistics

	Abu Dhabi Stock Exchange	Dubai Financial Market
Mean	1.561	1.558
Median	1.328	1.075
Maximum	9.333	11.207
Minimum	0.010	0.101
Standard Deviation	1.130	1.542
No. of Observations	1656	4603

Notes: Spread = $[(Ask_i - Bid_i) / Bid_i)]*100$. $Spread_1$ refers to the percentage bid-ask spread of stock i at the end of the trading day t, Ask is the ask quote and Bid is the bid price at the end of day t.

Table 7: Sub-period Estimates of the Spread: Some Basic Information

	Abu Dhabi Stock Exchange		Dubai Financial Market	
	1st Sub-Period	2nd Sub-Period	1st Sub-Period	2nd Sub-Period
Mean	1.495	1.626	1.443	1.680
Median	1.276	1.356	1.111	0.990
Maximum	5.347	9.333	10.219	11.207
Minimum	0.255	0.100	0.216	0.101
Std. Deviation	1.007	1.237	1.154	1.861

Notes: Spread = $[(Ask_i - Bid_i) / Bid_i)]*100$. $Spread_1$ refers to the percentage bid-ask spread of stock i at the end of the trading day t, Ask is the ask quote and Bid is the bid price at the end of day t.

Table 8: Other Measures of the Spread

	Mean $Spread_1$	Mean $Spread_2$
Abu Dhabi Stock Exchange:		
Whole Period	0.015	1.543
1st Sub-Period	0.015	1.479
2nd Sub-Period	0.016	1.606
Dubai Financial Market:		
Whole Period	0.015	1.537
1st Sub-Period	0.014	1.426
2nd Sub-Period	0.017	1.655

Notes: $Spread_1 = s / \sqrt{Ask_i\ Bid_i}$; $Spread_2 = [(Ask_i - Bid_i) / Q_i)]*100$. Ask is the ask quote, Bid is the bid price at the end of day t, s indicates the difference between the bid and ask quotes, and Q_i refers to the midpoint between the bid and ask prices of stock i.

Table 9: Independent Variables: Some Basic Statistics

	VALUE	PRICE	RISK	SIZE	OWN
Abu Dhabi Stock Exchange:					
Whole Period	13.868	1.649	2.729	22.281	0.457
1st Sub-Period	14.177	1.701	3.017	22.282	0.456
2nd Sub-Period	13.562	1.597	2.444	22.280	0.457
Dubai Financial Market:					
Whole Period	14.366	1.102	3.378	21.102	0.529
1st Sub-Period	14.938	1.257	3.845	21.201	0.528
2nd Sub-Period	13.754	0.936	2.879	20.996	0.530

Notes: VALUE is the natural logarithm of trading volume defined as the daily trading volume; PRICE is equal to one plus the natural logarithm of stock price; RISK is the difference between the highest and lowest price divided by the closing price; SIZE is the natural logarithm of market capitalization; OWN is the proportion of the shares which are owned by those who own 5 percent of the shares or more.

Table 10: Regression Results: Whole Time Period

	Abu Dhabi Stock Exchange	Dubai Financial Market
Variable	**Coefficient**	**Coefficient**
VOL	-0.419*	-0.662*
PRICE	-0.368*	-0.151*
RISK	0.198*	0.222*
SIZE	0.143*	0.168*
OWN	-0.117*	-0.009*
DUMMY	-------	-0.117*
Adjusted R^2	0.321	0.369
D-W Statistic	1.712	1.747
F-Statistic	196.332*	539.918*

Notes: $SPREAD_{i,t}=\alpha_0+\alpha_1 \ln(VOL_{i,t})+\alpha_2 \ln(PRICE_{i,t})+\alpha_3(RISK_{i,t})+\alpha_4 \ln(SIZE_{i,t})+\alpha_5(OWN_{i,t})+\alpha_6(DUM_{t,})+\varepsilon_{i,t}$. SPREAD is the bid-ask spread (as defined above); VOL is the natural logarithm of trading volume defined as the daily trading volume (in Dinars); PRICE is equal to one plus the natural logarithm of stock price; RISK is the difference between the highest and lowest price divided by the closing price; SIZE is the natural logarithm of market capitalization; OWN is the proportion of the shares which are owned by those who own 5 percent of the shares or more; DUMMY is a dummy variable which is equal to 0 in the first sub-period and 1 in the second sub-period. * indicates that White (1980) heteroskedasticity-constant t-statistic is significant at the 1 percent level.

Table 11: Regression Results: First and Second Sub-period (Abu Dhabi Stock Exchange)

Variable	Coefficient (First Sub-Period)	Coefficient (Second Sub-Period)
VOL	-0.407*	-0.428*
PRICE	-0.375*	-0.345*
RISK	0.168*	0.242*
SIZE	0.146*	0.136*
OWN	-0.171*	-0.159*
Adjusted R^2	0.349	0.302
D-W Statistic	1.875	1.765
F-Statistic	111.444*	90.790*

Notes: $SPREAD_{i,t}=\alpha_0+\alpha_1 ln(VOL_{i,t})+\alpha_2 ln(PRICE_{i,t})+\alpha_3(RISK_{i,t})+\alpha_4 ln(SIZE_{i,t})+\alpha_5(OWN_{i,t})+\varepsilon_{i,t}$. SPREAD is the bid-ask spread (as defined above); VOL is the natural logarithm of trading volume defined as the daily trading volume (in Dinars); PRICE is equal to one plus the natural logarithm of stock price; RISK is the difference between the highest and lowest price divided by the closing price; SIZE is the natural logarithm of market capitalization; OWN is the proportion of the shares which are owned by those who own 5 percent of the shares or more. * indicates that White (1980) heteroskedasticity-constant t-statistic is significant at the 1 percent level.

Table 12: Regression Results: First and Second Sub-period (Dubai Financial Market)

Variable	Coefficient First Sub-Period	Coefficient Second Sub-Period
VOL	-0.501*	-0.843*
PRICE	-0.349*	-0.091*
RISK	0.130*	0.331*
SIZE	0.169*	0.156*
OWN	-0.089*	-0.054*
Adjusted R^2	0.320	0.453
D-W Statistic	1.543	1.721
F-Statistic	280.767*	461.137*

Notes: $SPREAD_{i,t}=\alpha_0+\alpha_1 ln(VOL_{i,t})+\alpha_2 ln(PRICE_{i,t})+\alpha_3(RISK_{i,t})+\alpha_4 ln(SIZE_{i,t})+\alpha_5(OWN_{i,t})+\varepsilon_{i,t}$. SPREAD is the bid-ask spread (as defined above); VOL is the natural logarithm of trading volume defined as the daily trading volume (in Dinars); PRICE is equal to one plus the natural logarithm of stock price; RISK is the difference between the highest and lowest price divided by the closing price; SIZE is the natural logarithm of market capitalization; OWN is the proportion of the shares which are owned by those who own 5 percent of the shares or more. * indicates that White (1980) heteroskedasticity-constant t-statistic is significant at the 1 percent level.