Does corporate governance affect stock liquidity in the Tunisian Stock Market?

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Abstract:

The aim of the current paper is to study the link between the effects of corporate governance on information asymmetry problems and stock liquidity in the Tunisian Stock Market. We use a sample of 49 Tunisian firms listed between 1998 and 2007. Our results show that corporate governance has direct and indirect effects on stock liquidity. Threat of expropriation exerted by family and foreign shareholders discourages reluctant investors, which decreases stock liquidity. In contrast, they invest their capital in State controlled firms. In fact, State is regarded as an effective controller rather than a shareholder. The State involvement in Tunisian firms is considered as state guarantee for investors, which increases stock liquidity. Our results provide evidence that some attributes of corporate governance improve stock liquidity because they reduce information asymmetry.

Key words: corporate governance, shareholder identity, stock liquidity, Tunisian Stock Exchange

JEL Classification: G10, G34.

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1. Introduction

Literature on market microstructure outlines the importance of stock liquidity in financial markets. Handa and Schwartz (1996) argue that: *"Investors want three things from the markets: liquidity, liquidity and liquidity"*. High premium in both developed and emerging markets[3] are the result of the high risk of illiquidity. The increase of stock liquidity improves firm's reputation in financial markets. Consequently, it increases firm's value (Amihud and Mendelson, 2008) and reduces capital cost (Diamond and Verrecchia, 1991). Finding ways to increase stock liquidity has attracted considerable interest of both academics and professionals: whether they are regulators or financial analysts. For instance, regulators protect minority investors against expropriation risk and encourage their active participation in markets, which improves to some extent liquidity (Brockman and Chung, 2003, 2008).

More recently, Heflin and Shaw (2000), Rubin (2007), Chen et al. (2007), Kanagaretnam et al. (2007) and Chung et al. (2010) focused on corporate governance as a mean to enhance stock liquidity. They argue that effective control mechanisms, such as constraining firms to disclose more information and hiring independent directors reduce expropriation risk and increase profitability. In fact, such mechanisms reduce information asymmetry problems between majority and minority shareholders, and enhance consequently stock liquidity. However, these studies were conducted in developed markets where liquidity is high, investors are well protected and ownership is widely dispersed. In emerging markets, only some studies address this issue (Mattoussi et al., 2004, Gana and Chemli, 2008; Ben Sedrine and Loukil, 2008; Belkhir and Bouri, 2008 and Haddad et al., 2009). They show that hese markets display different characteristics: markets are poorly regulated in addition to the low market liquidity and the high concentration of ownership. When investors have no state guarantees, main agency problems arise between monitory and majority shareholders (Ben Ali, 2009).

Whether they are conducted in developed or emerging markets, to our knowledge, these studies have tested effects of one single attribute of corporate governance on stock liquidity: ownership structure (Rubin, 2007 and Attig et al. 2006), board of directors (Kanagaretnam et al., 2007) and voluntary information (Chen et al., 2007 and Haddad et al., 2009). In addition to the explanation of the link between corporate governance and stock liquidity, they argue that corporate governance mechanisms mitigate information asymmetry

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[3] See among others Amihud and Mendelson (1986), Eleswarapu and Reinganum (1993), Brennan and Subrahmanyam (1996), Chordia et al. (2001) and Loukil et al. (2010).

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problems which improve stock liquidity. Thus, corporate governance has indirect effects on stock liquidity.

In the current study, we measure simultaneously the effects of many attributes of corporate governance such as the structure of the ultimate ownership and the characteristics of corporate board (board independence, weight of the first ultimate owner and the board size), on asymmetric information problems and then on liquidity. We raise the following question: *does corporate governance affect stock liquidity in emerging markets?*

We use a sample of financial and non financial firms which are listed in Tunis Stock Exchange (TSE) from 1998 to 2007. Our sample shows the presence of one shareholder who is majority. This leads us to analyze how corporate governance can solve agency conflicts between majority and minority shareholders and what are the effects on stock liquidity. We notice that these firms may be controlled by State, or family or even foreign investors. So we test if the corporate governance scheme depends on the shareholder's identity (in Chinese market, it is closely related to this identity, see among others Firth et al., 2007; Chi and Wang, 2009; Wu et al. 2009).

In contrast with previous studies which tested only the impact of corporate governance on stock liquidity, we distinguish between direct and indirect effects of corporate governance on stock liquidity. We focus on the effects of corporate governance on asymmetric information and examine then the link between the level of information asymmetry and stock liquidity.

Our empirical findings provide evidence that high ownership concentration and separation between cash-flows and voting rights encourage opportunistic behavior of the first ultimate owner. In order to get private benefits, he or she relies on his or her private information. These results are in line with those of Attig and *al.* (2006). Moreover, effective board of directors (large board and separation between functions of control and management) decreases the information asymmetry problems. This reduces informed trading and improves stock liquidity. In fact, if uninformed agents suspect the presence of informed agents, they trade only when their interests are protected (for example with high risk premium). This increases transaction costs and decreases consequently stock liquidity. At a microeconomic level, we join Cai et al. (2006) and Kanagaretnam et al. (2007), and show that stock liquidity decreases with the increase of the percentage of informed agents.

In addition, it seems that the identity of ultimate owner is a proxy of the level of expropriation risk. Indeed, Tunisian investors pay more attention to the identity of the ultimate owner whatever what they own. State owner is regarded as an effective controller who protects their interests against expropriation of majority shareholders, while foreign and family investors are more likely to get an opportunistic behavior. Hence, the owner identity has a direct effect on investors' decisions and consequently on stock liquidity.

Section 2 presents a survey of the literature on corporate governance and stock liquidity and provides hypotheses. Section 3 describes the sample and the methodology. Section 4 discusses empirical findings. Section 5 concludes the paper.

2. Literature review and hypotheses

The relationship between corporate governance mechanisms (ownership structure, board composition and voluntary disclosure) and liquidity is well covered by the financial literature[4]. The main findings are that high levels of corporate governance reduce information asymmetry between informed and uninformed investors which increase stock liquidity. Thus, corporate governance has indirect effect on stock liquidity.

However, uninformed agents prefer investing in firms with high levels of corporate governance because it may have direct effect on their stock liquidity (Giannetti and Simonov, 2006). In the following subsections, we develop conceptual framework that allow us to distinguish between direct and indirect effects of corporate governance on stock liquidity.

2.1. Corporate governance, information asymmetry and stock liquidity

Our paper is related to three strands of the literature on corporate governance and stock liquidity.

The first strand analyzes the relationship between ownership structure and liquidity. For instance, Heflin and Shaw (2000) argue that outside investors consider block holders as insiders, which increases information asymmetry and decreases stock liquidity. However, concentration of voting rights allows dominant shareholder to control firms and enables them to enjoy private benefits if expropriation of minority shareholders is possible. Concentration of cash-flow rights encourages them to control firms effectively. When shareholder has more voting rights than ownership rights, dominant owners don't care about firm's objectives: they

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[4] See among others Heflin and Shaw (2000), Rubin (2007), Chen et al. (2007), Kanagaretnam et al.(2007) and more recently Chung et al. (2010)

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pay more attention to their personal interests (Claessens et *al.*, 2002; La Porta et *al.* 1999). For instance, dominant shareholders can expropriate minority shareholder. In practice, they provide funds only if they have private information about projects they would invest in which decreases stock liquidity (Attig et *al.*, 2006). Most empirical studies do not provide evidence that minority expropriation decreases liquidity in developed markets. Heflin and Shaw (2000) report a positive relation between spread and block holder ownership in American firms. However in Canadian firms, Attig et al. (2006) find a positive relationship between deviation of control from ownership and bid-ask spread.

The second strand of literature is more recent and analyzes the effect of board composition on liquidity (Cai et al. 2006 and Kanagaretnam et al., 2007). It shows that board independence reduces asymmetric information and improves consequently liquidity in developed markets.

The current paper is also related to the literature on corporate disclosure. Voluntary disclosure may reduce information asymmetry risk (Brown and Hillegeist, 2007). So, high level of disclosure improves liquidity and decreases capital cost (Amihud and Mendelson, 1986; Diamond and Verrecchia, 1991). Empirical studies in developed markets provide evidence that there is positive relationship between disclosure and liquidity, in contrast with studies conducted in emerging markets which have non-conclusive results. Welker (1995) and Chen et al. (2007) report a positive relationship between corporate disclosure policy and stock liquidity in US markets. Heflin et *al.* (2005) find evidence that high level of voluntary disclosure mitigates information asymmetry problems, which reduces transaction cost. Also, Hillegeist and Brown (2007) confirm that high quality of disclosure decreases the percentage of trading. Results of Mattoussi et al. (2004) and Haddad et *al.* (2009) are consistent with previous findings in Tunisian and Jordanian markets while Gana and Chemli (2008) report that voluntary disclosure decreases stock liquidity. According to the previous findings, corporate governance mechanisms reduce information asymmetry problems which have a positive effect on liquidity. Hence, we state the following hypothesis:

H1: Corporate governance mechanisms have indirect effect on stock liquidity.

2.2. Corporate governance, fear of expropriation and stock liquidity

Protection of investors' rights and interests encourages small investors, particularly who are wealth-constrained and have no business experience (La Porta et al., 1997, 1998, 1999 and 2000). However, when shareholder protection is poor, insiders pay considerable attention to control rights. It is a mean to expropriate outside investors. In such institutional setting, corporate ownership is concentrated in the hands of one shareholder. Consequently, minority shareholders have no significant decision power (La Porta et al., 1999, 2000).

When investors are poorly protected, like in emerging markets, corporate governance replaces investors' protection. Indeed, good corporate governance scheme reduces the expropriation risk of minority shareholders and protects their financial interests (Shleifer and Vishny, 1997). McKinsey's study conducted by Coombes and Watson (2000) provides evidence that, in poorly regulated markets, investors pay higher premiums when there is more effective governance. Giannetti and Simonov (2006) argue that investors' choice may be driven by fear of expropriation: investors are more reluctant to hold stocks in firms when extraction threat of private benefits is more severe. In other words, small investors prefer firms which have effective corporate governance. One explanation is that corporate governance may substitute for regulation and play more important role when the market is poorly regulated and expropriation risk is high.

Some studies, see among others Klapper and Love (2004), Durnev (2005, 2007) and Chen et al. (2009), advance that in emerging markets, investors prefer firms with good corporate governance. They noticed that firm's value increases and equity cost decreases when the quality of corporate governance improves. It has more significant effect than in developed ones. Accordingly, corporate governance is a credible mean to protect investors. Notice that regulatory reform is difficult to do and requires longer time (Klapper and Love, 2004). Hence, corporate governance helps to build a relationship of trust between insiders and outsiders. We advance the following hypothesis:

H2: A direct mean to enhance stock liquidity is to improve the quality of corporate governance.

3. Methodology

3.1. Sample and data collection

We consider a sample of common ordinary stocks of 49 firms listed in TSE between 1998 and 2007 (see table 1). Daily trading data are provided by TSE and contain closing price, trading volume, best ask and best bid. Corporate governance data is collected manually from annual reports and "Stock Guide" provided by TSE and Financial Council Market (CMF). These data provide information about shareholders and board of directors.

Table 1. Sample composition

Stocks by industries	
Banks	10
Other financial firms	11
Services	9
Manufacturing firms	19
Total	49

3.2. Stock liquidity and information asymmetry proxies

Microstructure market literature defines many liquidity proxies but, some liquidity proxies, such us spread and Amihud ratio, are biased when the sample contains infrequently traded stocks (Lesmond, 2005 and Liu, 2006). Accordingly, we use the number of non trading days adjusted by turnover as liquidity proxy as in Liu (2006). Notice that Liu measure is also more appropriate than average daily spread which does not capture liquidity risk when the frequency of non trading days is high. In non trading days the ratio of return to volume cannot be calculated. Moreover, Liu proxy is multidimensional in the sense it captures (1) potential timing of execution order; 2) quantity of transactions (number, volume); and (3) transaction costs. The Liu measure is the standardized turnover-adjusted number of zero daily trading volumes. It's written:

$$LMx = \left[NoZV_x + \frac{1/TURN_x}{Deflator} \right] \times \frac{21x}{NoTD}$$

where NoZV is the number of no trading days; TURN is the stock turnover; NoTD is the number of trading days in the market during the period x, and deflator[3] is chosen arbitrary such that

$$0 \langle \frac{1/TURN \quad x}{deflator} \langle 1$$

Our empirical proxy of information asymmetry is the percentage of informed trading **AIMO** (Aktas et *al*., 2007), given by:

$$AIMO = \left| (QB - QS)/(QB + QS) \right|$$

where QB and QS represent asked and offered quantities respectively.

According to Easley et *al.* (1996), informed traders submit more buy (respectively sell) orders when they hold good (respectively bad) signal information. Hence, the difference between informed and uninformed trading measures the degree of information asymmetry in the market. Hmaied et *al.* (2006) show that, in Tunisian Stock market, informed traders submit more buy orders than uninformed ones.

3.3. Corporate governance mechanisms

Ultimate ownership structure

LaPorta et al. (1999) and Claessens et al. (2000) outline the difficulty of identifying the ultimate controlling shareholders: we must define the threshold of participation to get the control. The choice of this *threshold* depends on legal countries origin. LaPorta et al. (1999) find that, in common law countries, firms are widely held firms and 10 % of voting rights is enough to control individually a firm, like in the United States, United Kingdom and Japan. In civil law countries, the threshold is too high because corporate ownership is highly concentrated.

In Tunisia, the ultimate owner should raise 20% of the capital. According to the article 290 of Commercial Companies Code, shareholders can cancel management decisions when they hold at least 20 % of the capital. Omri (2003) defines block holders in Tunisian firms as shareholders who own at least 20 % of the capital.

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[3] We use a deflator of 3500 000 in constructing LM proxy.

We measure control rights (**VOTR**) and cash-flow rights (**CASR**) of ultimate owners as in La Porta et *al.* (1999) and Claessens et *al.* (2000). To define an ultimate owner let us consider the following example: a shareholder Z holds 50% of the capital of firm X, which holds 20% of the capital of firm Y. Hence, shareholder Z is the ultimate owner of firm Y because he holds 10% (=50%*20%) of cash-flow rights and 20% as control rights (min{50%, 20%}). Our sample shows the presence of at least two ultimate owners. This is why we measure cash-flow rights of the first and the cash flow rights second ultimate owners hereafter denoted by **CASR1** and **CASR2** respectively.

The difference between the voting rights of the first ultimate (**VOTR1**) and their cash-flow rights (**CASR1**) is an estimation of expropriation risk (Claessens et *al.*, 2002; Attig et *al.*, 2006). It is written:

$$\textbf{DIVC= VOTR1 - CASR1}$$

We are also interested in the identity of the ultimate owner. Many categories of owner behave differently, according to their interests and preferences (Pederson and Thomsen, 2000 and Thomsen and Pederson, 2003). In emerging economies, owner identity is more important than ownership concentration (Dyck, 2000; Firth et al. 2007; Omran et al. 2008; Wu et al. 2009 and Chi and Wang, 2009). We consider dummies proxies to distinguish three owner groups: family (**CFAM**), State (**CSTA**) and foreign investor (**CFOR**) such that:

$$\textbf{CFAM=} \begin{cases} 1 & \textit{if the first ultimate owner is family} \\ 0 & \textit{otherwise} \end{cases}$$

$$\textbf{CSTA=} \begin{cases} 1 & \textit{if the first ultimate owner is the State} \\ 0 & \textit{otherwise} \end{cases}$$

$$\textbf{CFOR=} \begin{cases} 1 & \textit{if the first ultimate owner is the foreign investor} \\ 0 & \textit{otherwise} \end{cases}$$

Corporate board characteristics

We focus on three characteristics of corporate board: board independence, weight of the first ultimate owner in the board and board size:

- The board size (**BSIZ**) is the total number of directors.

- To measure the degree of independence, we use, first, the percentage of independent directors in the board (**INDP**). Independent directors are directors who have no relationship with the management team (neither financial nor personal relationship).

- In addition, we introduce the separation of control and management functions (**SPLI**) as second proxy of board independence.

$$\text{\textbf{SPLI}}=\begin{cases}1 \; if \; separation \; between \; control \; and \; management \\ 0 \; otherwise\end{cases}$$

- We measure the weight of the first ultimate owner in board by the percentage of affiliated directors (**AFFD**). According to Dahya et *al.* (2008), affiliated director are: 1) the ultimate owner; 2) a member of family when the ultimate owner is family, 3) an employee of the firm, its subsidiary or employee of others firms controlled by ultimate owner, 4) a politician or public servant when the ultimate owner is the State; and 5) employee of foreign firm domiciled in the same country as the ultimate owner when he is a foreign investor.

4. Empirical results

4.1. Sample characteristics

Table 2 presents descriptive statistics about stock liquidity, information asymmetry and corporate governance characteristics. There are 79,4 non trading days on average (Panel A) while non trading days exceed 53 days in 50% of our observation. Moreover, the liquidity measure is highly dispersed.

Table 2. Descriptive statistics

Panel A. Stock liquidity and information asymmetry		
Legend: LM= standardized turnover-adjusted number of zero daily trading volume; AIMO= absolute value of imbalance order.		
	LM	**AIMO**
N	385	385
Mean	79,405	55,945
Median	53,425	52,558
Standard deviation	75,913	16,881
Skewness	0,808	0,683
Kurtosis	-0,739	-0,229

Minimum		0	25,158
Maximum		252	99,998

Panel B. Ownership distribution		
	N	**Frequency (%)**
Dispersed ownership	19	5,39
One ultimate owner	287	81,53
Two ultimate owner	46	13,07
Ownership and control deviation	79	22,44
Family	117	33,24
State	136	38,63
Foreign	76	21,59
Institutional	4	1,13

Panel C. ownership concentration

Legend: CASR1= % cash-flow rights of the first ultimate owner; CASR2=% of cash-flow rights of the second ultimate owner; DIVC=the divergence between the voting rights and the cash-flow rights; BSIZ= total number of directors; IDEP=% of independents directors; AFFD=% of affiliated directors to dominant shareholder; SPLI= 1 if there is a separation between the functions of CEO and chairman and 0 if not.

	CASR1	**CASR2**	**DIVC**	**INDP**	**AFFD**	**BSIZ**	**SPLI (%)**
N	352	352	352	352	352	352	23,63
frequency	-	-	-	-	-	-	
Mean	0,441	0,02	0,028	0,082	0,547	9,794	
Median	0,457	0	0	0	0,571	10	
Standard deviation	0,213	0,063	0,061	0,133	0,267	1,998	
Skewness	0,009	3,17	2,198	1748	-0,357	-0,701	
Kurtosis	-0,069	8,799	4,054	2233	-0,67	-0,356	
Minimum	0	0	0	0	0	4	
Maximum	0,992	0,291	0,308	0,556	1	12	

We find that, on average, more than half of transactions are initiated by informed traders. This means that Tunisian Stock market displays severe asymmetric information.

In Panel B, statistics indicate that the control threshold 20% is enough to control individually firms in 81,53% of firm-year observations. 13% observations show the presence of two ultimate owners and a low frequency of divergence between ultimate ownership and control of first owner (23,72%).

Tunisian firms are controlled by three categories of shareholders: State, family or foreign investors.

Panel C points out that the first ultimate owner has high cash-flow rights (on average 44%). On average, the proportion of independent directors is low (8%) and well dispersed. However, 50% of directors are affiliated with the first ultimate owner. This highlights the weight of first ultimate owner.

In addition, statistics indicate that Tunisian CEOs has usually two functions: chief executive director and board chairman in small directors' board (contains on average ten members).

4.2. Multivariate Analysis

According to the first hypothesis, effective corporate governance diminishes asymmetric information which should improve stock liquidity. However, according to the second hypothesis, the relation between corporate governance and stock liquidity may be direct if investors can get an idea about the quality of corporate governance in which they would like to invest in.

In order to test these hypotheses, we analyze, first, the effects of corporate governance mechanisms on asymmetric information. Second, we analyze the link between these effects and variation of stock liquidity.

4.2.1. Governance mechanisms and information asymmetry in Tunisian listed firms

Hereafter, we use nonlinear principal component analysis (PCA) to examine the relation between governance mechanisms and information asymmetry problems. The nonlinear PCA does not rely on assumptions like normality and linear relationships among variables in linear PCA. Indeed, it is particularly suited when some variables are dummies or when relationships between variables are nonlinear.

In this study, we use non linear PCA because used variables in factor analysis incorporate numerical and dummy variables. These variables are closely related to the corporate board (four variables), the ultimate ownership structure (six variables) and the private collection of information (one variable). Accordingly, we select four factorial axes. The first axis explains most of the variance with 22%, while the second and third axes explain 18% and 15% respectively of total variance. The last axis captures only 10% of the total variance.

The following table presents Eigen values and percentages of explained variance.

Table 3. Nonlinear principal component analysis

Panel A. Eigen values and explained variance

Dimension	Eigen value	% Explained variance
1	2,405	21,860
2	1,945	17,686
3	1,692	15,382
4	1,145	10,405
Total	7,187	65,533

Panel B. Correlations between corporate governance variables, information asymmetry and selected axis

Legend

CASR1= % cash-flow rights of the first ultimate owner; CASR2=% of cash-flow rights of the second ultimate owner; DIVC=the divergence between the voting rights and the cash-flow rights; CFAM= 1 if the first ultimate owner is family and 0 if not; CSTA= 1 if the first ultimate owner is State and 0 if not; CFOR= 1 if the first ultimate owner is foreign investor ; BSIZ= total number of directors; IDEP=% of independents directors; AFFD=% of affiliated directors to dominant shareholder; SPLI= 1 if there is a separation between the functions of CEO and chairman and 0 if not; AIMO= absolute value of imbalance order.

		Dimensions			
		1	**2**	**3**	**4**
Board	**BSIZ**	0,1	**-0,426**	**-0,557**	0,041
characteristics	**SPLI**	-0,374	-0,126	**-0,528**	-0,31
	INDP	**-0,62**	0,023	0,162	-0,096
	AFFD	**0,623**	**0,487**	-0,182	0,276
Ultimate	**CASR1**	0,156	**0,743**	**-0,424**	0,268
ownership	**CASR2**	-0,384	0,115	**0,515**	**0,484**
structure	**DIVC**	0,333	-0,417	**0,4**	-0,351
	CFAM	-0,568	**0,619**	-0,102	-0,357
	CFOR	-0,295	**-0,561**	-0,19	**0,623**
	CSTA	**0,878**	-0,005	0,192	-0,116
Information	**AIMO**	-0,134	0,269	**0,596**	0,056
asymmetry					

Axis 1: State controlled firms

The first axis shows significant correlations between two groups of variables. The first group contains the presence of the State as the first ultimate owner and the proportion of affiliated directors. These variables are positively and highly associated to the axis. The second group negatively correlated to the axis and contains the following variables: the

presence of family owner as the first ultimate owner and the proportion of independents directors. Accordingly, the first axis allows us to distinguish the characteristics of corporate governance in State controlled firms. In these firms, corporate board is dominated by representatives of the State and is characterized by a low presence of independent directors. State ownership may be considered as a substitute for legal investor protection in emerging markets (Wu et al., 2009). Hence, the presence of this owner decreases expropriation fear.

Axis 2: Family controlled firms

We detect a first group of variables related strongly and positively to the second axis. This group contains: (1) cash-flow rights of the first ultimate shareholder; (2) the presence of family as a first ultimate owner and (3) the percentage of affiliated directors which captures the power of family controller.

The second group contains two variables: the presence of foreign investors as the first ultimate shareholder and the board size. These variables are negatively associated to the second axis. Thus, the second axis describes family control which shows highly concentrated cash-flow rights, important number of family members in board of directors and a small board size. The fact that emerging markets are poorly regulated encourages family owner to extract private benefits and to expropriate minority shareholders (Faccio et *al.*, 2001; Maury, 2006).

Axis 3: Information asymmetry problems

The third axis is positively related to information asymmetry, cash-flow rights of the second ultimate owner and difference between voting and cash-flow rights. In addition, this axis is negatively related to cash-flow rights of the first ultimate owner, the separation of control and management and board size.

Therefore, firms characterized by: large separation between control and ownership (**DIVC**) and high cash-flow rights of the second ultimate owner are subject to severe problems of asymmetric information which increases informed trading. In contrast, large ultimate ownership of the first owner, large board size and separation of control and management functions mitigate asymmetric information and decrease consequently proportion of informed trading.

Axis 4: Foreign controlled firms

The fourth axis is related positively and strongly to the presence of foreign investor as first ultimate owner and to cash-flow rights of the second ultimate owner. Domestic investors

consider firms controlled by foreign investors as foreign firms and they are expecting high expropriation risk. This is why they prefer domestic companies (Rhee and Wang, 2009).

Our results provide strong evidence that there is no correlation between the identity of ultimate owner and information asymmetry problems. In addition, we find that some mechanisms of corporate governance, such as board size, separation of functions of executive and control, cash-flow rights of the first and the second largest shareholder and the deviation between control and ownership mitigate information asymmetry.

These axes enable us to test if corporate governance mechanisms affect indirectly liquidity when they diminish asymmetric information or when making decisions depend on the identity of the ultimate owner.

4.3. Impact of Tunisian corporate governance on stock liquidity

We study the effect of three types of corporate control (State, family and foreign) and the effect of information asymmetry problems on stock liquidity. Moreover, we consider the following control variables: volatility (**VLAT**), firm size (**SIZE**), and book to market ratio (**BTMK**). The model is written now:

$$LM_{it} = \phi_0 + \phi_1 AXE1_{it} + \phi_2 AXE2_{it} + \phi_3 AXE3_{it} + \phi_4 AXE4_{it} + \phi_5 SIZE_{it} + \phi_6 VLAT_{it} + \phi_7 BTMK_{it} + \varepsilon_{it}$$

AXE1, AXE2 and AXE 4 describe corporate governance in firms controlled by State, family and foreign owners respectively while AXE3 describes attributes of corporate governance when firms are subject to information asymmetry problems.

Table 4. Relationship between corporate governance, information asymmetry and stock liquidity

Legend	
AXE1= State control ; AXE2= family control; AXE3= information asymmetry problems ; AXE4= foreign control; BTMK=book-to-market ratio; VLAT= stock returns volatility ; SIZE= firm market capitalization	
$LM_{it} = \phi_0 + \phi_1 AXE\ 1_{it} + \phi_2 AXE\ 2_{it} + \phi_3 AXE\ 3_{it} + \phi_4 AXE\ 4_{it} + \phi_5 SIZE_{it} + \phi_6 VLAT_{it} + \phi_7 BTMK_{it} + \varepsilon_{it}$	
AXE1	-22.246
	(11.73)**
AXE2	13.987
	(6.35)**
AXE3	23.807
	(11.28)**
AXE4	24.263
	(11.85)**
SIZE	-24.628
	(10.36)**

VLAT	-10.329
	(3.06)**
BTMK	36.505
	(3.75)**
Constant	436.228
	(10.48)**
Observations	347
Firms	49

*, **: statistically significant at the level of 5%, and 1% respectively.

Results show that the coefficient for State control (AXE1) is negative and significant ($p < 0.01$). It seems that investors are more confident when State is majority shareholder, which increases therefore liquidity. We join Ang and Ding (2006) and show that State plays an active role in controlling investors in poorly regulated markets like emerging markets. These results are consistent with the idea that State shareholder provides real guarantee when there is no real legal protection for investors and this improves stock liquidity.

However, the coefficients for family and foreign control (AXE2 and AXE4) are positive and significant ($p < 0.01$). These findings indicate that stock liquidity decreases with family control. This result shows that Tunisian investors are not willing to invest in family controlled firms. This explanation is in line with the argument that expropriation risk is more severe in family controlled firms in poorly regulated markets (Faccio et al., 2001 and Maury, 2006) which discourages investors to trade on stocks of these firms.

Additionally, foreign control decreases stock liquidity which is consistent with finding of Rhee and Wang (2009). One explanation is that Tunisian investors do not trust the foreign controlling shareholders: they are regarded as informed traders who can expropriate their wealth. When foreign control increases, Tunisian investors consider firms as foreign ones and prefer to trade on stocks of domestic firms.

These findings are consistent with the corporate governance direct effect hypothesis H2. Hence, Tunisian investors pay considerable attention to the control's type (family, State or Foreign). They prefer investing in firms controlled by State shareholder which leads to high levels of stock liquidity in these firms. In contrast, they are reluctant when there the majority shareholder is family or foreign investors, which lead to low stock liquidity in these firms.

Accordingly, we conclude that corporate governance has direct effects on stock liquidity in Tunisian firms.

Table 4 indicates that the coefficient for information asymmetry (AXE3) is positive and significant ($p < 0.01$). This finding confirms the corporate governance indirect effect hypothesis H1. Hence, corporate governance has indirect effect on stock liquidity when it mitigates asymmetric information.

We show that illiquid stocks suffer from high information asymmetry problems. These stocks are those of firms characterized by: 1) high ultimate ownership of the second owner; 2) large separation between cash-flow and voting rights of the first owner; 3) CEO duality and 4) small board of directors. In other words, if low levels of corporate governance increases informed trading and leads to low levels of stock liquidity.

4.4. Robustness analysis

4.4.1. Other liquidity proxies

We replace Liu measure by other liquidity measures to test the robustness of previous results. The idea is to take into account transaction costs, we use the following proxies:

- The relative bid ask spread (**BASQ**), it is written:

$$BASQ = \frac{1}{N} \sum_{j=1}^{N} 2 \times \left(\frac{bestask\,price_j - bestbid\,price_j}{bestask\,price_j + bestbid\,price_j} \right) \times 100$$

where N is number of trading days in year and prices are in day j.

- The illiquidity ratio (**ILIQ**) proposed by Amihud (2002) is written:

$$ILIQ = \frac{1}{N} \sum_{j=1}^{N} \left| R_j \right| / Vol_j \times 10^6 ,$$

where $\left| R_j \right|$ is the absolute value of daily return and $Vol_j \times P_j$ is the daily transaction volume in Tunisian Dinars(TND)[5].

- The proportion of days with zero returns (**PZER**) proposed by Lesmond et al. (1999):

$$PZER = \frac{number\,of\ zero\,return}{N}$$

To capture quantity dimension, we use turnover ratio (**TURN**) and quoted depth (**DEPH**) given respectively by:

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[5] 1TND≈0,69665 USD

$$TURN = \frac{1}{N} \sum_{j=1}^{N} \frac{TRAD_j}{OUTS},$$

$$DEPH = \frac{1}{N} \sum_{j=1}^{N} (QA_j + QB_j)$$

Where TRAD is trading volume in day j; OUTS are outstanding shares; QA_j is the quantity at best ask closing day j; and QB_j is the quantity at best bid closing day j.

Table 4. Robustness results: Corporate governance and other liquidity proxies

Legend
BASQ=The average quoted daily spread; PZER= the proportion of days zero return; ILIQ= the average ratio of a stock absolute daily return to its daily dinars volume; DEPH= the average quoted daily depth; TURN= the average daily stock turnover; AXE1= corporate governance by State; AXE2= family corporate governance; AXE3= information asymmetry problems; AXE4= foreign corporate governance; BTMK=book-to-market ratio; VLAT= stock returns volatility; SIZE= firm market capitalization.
Model:

$liquidity_{it} = \phi_0 + \phi_1 AXE1_{it} + \phi_2 AXE2_{it} + \phi_3 AXE3_{it} + \phi_4 AXE4_{it} + \phi_5 SIZE_{it} + \phi_6 VLAT_{it} + \phi_7 BTMK_{it} + \varepsilon_{it}$

	BASQ	ILIQ	PZER	PROF	TURN
AXE1	-0.050	-0.251	-6.961	0.148	0.100
	(2.47)**	(3.28)**	(4.72)**	(5.36)**	(2.13)*
AXE2	0.056	0.137	1.690	0.020	-0.077
	(2.36)**	(1.69)*	(1.09)	(0.72)	(1.54)
AXE3	0.135	0.189	2.857	-0.018	-0.220
	(6.30)**	(2.48)**	(2.52)**	(0.63)	(4.38)**
AXE4	0.152	0.388	0.130	-0.121	-0.477
	(6.43)**	(5.02)**	(0.12)	(3.85)**	(9.55)**
SIZE	-0.319	-0.945	-9.538	0.213	-0.021
	(13.24)**	(10.90)**	(8.50)**	(7.46)**	(0.41)
VLAT	0.032	0.371	-5.006	0.094	0.266
	(0.89)	(4.66)**	(7.61)**	(2.70)**	(3.21)**
BTMK	0.229	1.753	6.757	0.695	-1.842
	(2.18)*	(5.23)**	(1.69)*	(5.38)**	(8.28)**
Constant	6.525	18.517	201.975	2.181	-0.423
	(15.10)**	(11.54)**	(9.79)**	(4.17)**	(0.45)
Observations	347	344	344	344	347
N Firms	49	46	46	46	49

*,**: statistically significant at the level of 5%, and 1% respectively.

Table 4 shows that only some of previous results are robust, when we use spread and price impact as liquidity measures. In fact, some significant effects disappear when we consider new liquidity measures:

First, the State involvement as a shareholder still improves stock liquidity: it reduces transaction cost (BASQ, ILIQ and PZER) and enhances both market depth and frequency of trading activity. Our results provide strong evidence that Tunisian investors prefer issuing equity in State controlled firms because they are expecting low expropriation risk. Consequently, they set low transaction costs, which increases trading activity. Second, stocks

in family and foreign controlled firms have higher spread and significant impact of order flow on stock price. In fact, when Tunisian investors set prices and spread, they are expecting high expropriation risk. Third, stocks in foreign controlled firms display low trading volume (TURN and PROF). One explanation is that Tunisian investors are suspicious and do not invest their money in these firms. Finally, it seems that asymmetric information asymmetry increases transaction costs in contrast with frequency of trading activity. In fact, under asymmetric information, informed trading and consequently transaction costs increase.

4.3.2. The effect of regulation on the relationship between corporate governance and liquidity

Notice that financial firms operate in a highly regulated environment in contrast with nonfinancial firms. Hereafter, we analyze the role of corporate governance in financial and nonfinancial firms (Adams and Mehran, 2003, Caprio et al. 2007; Andres and Vallelado, 2008). The aim of regulators is to control managerial and board's decisions which may discourage large shareholders to control financial firms (Adams and Mehran, 2003). Hence, regulation can be considered as an outside mechanism of corporate governance (Andres and Vallelado, 2008). To our knowledge, this topic is not well discussed in financial literature (Adams and Ferreira, 2008). Some empirical studies find that corporate governance may be replaced by regulation (Joskow et *al*., 1993; Booth et *al*., 2002; Adams and Ferreira, 2008). However, other studies show that in well regulated markets, firms are constrained to set high levels of corporate governance (Adams and Mehran, 2003; Booth et *al*., 2002; Becher and Frye, 2010). Hereafter, we analyze the previous effects in financial and non-financial firms. First, we divide our sample into two groups: financial and non financial firms and run the previous regression in each group (Table 6). These groups are composed as follows:

Table 5. Sub-samples composition

Financial firms		Non Financial firms	
Banks	10	Services	9
Insurance	2	Manufacturing firms	19
Leasing	6		
Investment company	3		
Total	21	Total	28

Table 6. Robustness results: Impact of regulation on the relationship between corporate governance and stock liquidity

Model :

$$LM_{it} = \phi_0 + \phi_1 AXE1_{it} + \phi_2 AXE2_{it} + \phi_3 AXE3_{it} + \phi_4 AXE4_{it} + \phi_5 SIZE_{it} + \phi_6 VLAT_{it} + \phi_7 BTMK_{it} + \varepsilon_{it}$$

	LM	
	Non Financial firms	Financial firms
AXE1	-26.279	-18.181
	(8.75)**	(5.07)**
AXE2	5.254	25.952
	(0.90)	(7.48)**
AXE3	36.189	10.616
	(9.64)**	(3.44)**
AXE4	11.170	20.279
	(2.36)*	(8.04)**
SIZE	-12.897	-32.332
	(3.31)**	(9.98)**
VLAT	-13.257	-5.561
	(3.25)**	(2.10)*
BTMK	55.018	0.861
	(4.46)**	(0.05)
Constant	207.187	634.121
	(2.94)**	(10.15)**
Observations	179	167
Number of firms	28	20

( ) Absolute value of z statistics

* , ** are significant at 5% and 1% respectively

Many variables have the same effects discussed above on liquidity in both financial firms and in non-financial firms. Even if financial firms operate in highly regulated markets, it seems that regulation does not affect the relationship between corporate governance and stock liquidity. The State involvement is a signal of effective control which increases stock liquidity in both types of firms. In addition, foreign shareholder affects negatively stock liquidity in both groups, which confirm that Tunisian investors expect high expropriation risk when the controller is foreigner. However, family control has negative effect on stock liquidity in

financial firms and negative and no significant effect on stock liquidity in non financial firms. Our results show that stock liquidity is negative function of information asymmetry problems in financial and non-financial firms.

5. Conclusion

Our results show that corporate governance may improve stock liquidity in direct and indirect ways because it decreases information asymmetry problems. First, we find that information asymmetry depends on some characteristics of corporate governance (except identity of dominant shareholder and percentage of affiliated directors). Under asymmetric information, investor preferences depend negatively on expropriation risk which is closely related to the identity of the dominant shareholder. For instance, Tunisian investors are expecting low (respectively high) expropriation risk when the State (family or foreign respectively) is a majority shareholder. We provide evidence that some mechanisms of corporate governance affect liquidity since they mitigate asymmetric information problems.

In the current study, we used annual measures of liquidity which is not enough to analyze the effects of corporate governance on information asymmetry around announcement dates. Indeed, some studies (Kim and Verrecchia, 1991, 1994; Chae, 2005) analyzed investors' behavior and asymmetric information problems before and after announcement dates. Hence, it is interesting to study the link between corporate governance and stock liquidity using event studies.

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