

Corporate governance, enforcement institutions and corporate liquidity in the MENA region

Corporate
governance in
the MENA
region

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Abstract

Purpose – The study examines the effects of corporate governance and countrywide institutions and risk factors on corporate liquidity.

Design/methodology/approach – Using firm-level data, the authors analyze the effect of corporate governance and various economic, regulatory and social institutions on the liquidity of firms operating in the Middle East and North Africa (MENA) region. The authors use fixed-effects, firm-specific and country-level controls, disaggregated analysis, sensitivity and endogeneity analysis to test the robustness of the estimates.

Findings – The corporate governance characteristics of firms influence in diverse ways their liquidity decisions. The independence and diversity of the board and institutional ownership are especially strong predictors. The effect also depends on the size of the firm and the degree of economic development and exhibits time sensitivity and nonlinearity. Enforcement institutions and risk factors play a strong role.

Originality/value – The analysis contributes to the literature by using a large sample of countries and firms over a larger period, distinguishing between poorer and richer countries and using sensitivity and endogeneity analysis. The analysis considers explicitly the role of regulatory and enforcement conditions, social structures and religious beliefs.

Keywords Corporate governance, Liquidity, Institutions, Middle East and North Africa

Paper type Research paper

1. Introduction

Firms maintain liquidity for various reasons. Liquidity plays an important role in smoothing business operations, containing the cost of underinvestment in positive-net present value (NPV) projects due to lack of financing, and ensuring the solvency of the firm at the presence of adverse external shocks. However, excessive liquidity is a serious concern of shareholders. Holding of cash does not provide a return and allows corporate boards to invest in inefficient projects motivated by the potential extraction of private benefits (Jensen, 1986).

Corporate ownership structures and governance practices are key determinants of firms' liquidity. Comparative studies document significant variation in the association between corporate governance, other corporate characteristics and the liquidity preference of firms across countries (Harford *et al.*, 2008; Chen and Chuang, 2009; Chen, 2008; Lee and Park, 2016; Akhtar *et al.*, 2018). Further, the institutional environment in a country explains some of the variation in firms' liquidity. For example, the degree of shareholder protection in a country



affects the firms' cash flow management policies and preferred liquidity (Dittmar *et al.*, 2003; Akhtar *et al.*, 2018).

However, the overall evidence appears inconclusive. Some studies analyze the role of corporate governance in the trading liquidity of firms rather than their choice of liquidity, and they focus on developed countries, using relatively short periods (Chung *et al.*, 2010). Some studies find that board reforms are associated with lower liquidity (Chena *et al.*, 2020), or that the combination of inefficient governance practices and high liquidity exert a negative effect on the market value of firms (Opler *et al.*, 1999). Other studies suggest that inefficient corporate governance is associated with less liquidity but a faster pace of cash spending (Harford *et al.*, 2008). Cross-country studies do not find evidence of a robust association between corporate governance, firm value and liquidity (Kalcheva and Lins, 2007). Moreover, some studies find that the association between corporate governance and liquidity is nonlinear or insignificant after accounting for endogeneity bias (Loderer *et al.*, 2016). Finally, empirical studies do not adequately explore the mitigating role of institutions and other social influences in the behavior of firms.

Our study provides a further elucidation of the association between corporate governance and firm liquidity by studying the behavior of firms in Middle East and North Africa (henceforth MENA). The latter region has distinct characteristics and institutions. First, there is little information on the relation between corporate governance, institutions and cash holding practices in the region with sufficient coverage of countries, firms and institutions. Prior studies have either focused on single countries (Dittmar *et al.*, 2003; Alnori, 2020; Loncan, 2020) or used small samples and narrow coverage (Orlova and Sun, 2018; Al-Hadia *et al.*, 2020; Guizani, 2017; Al-Najjar and Clark, 2017; Guizani and Ajmi, 2021). Second, the incidence of corporate governance failure in the MENA region remains high with huge consequences for the financial health of companies and employment. Several episodes manifest this, including the failure of the Abraaj private equity firm due to ethical failures and cash embezzlement in 2018, the failure of the listed contractor Drake and Scull in 2018, the collapse of the multifaceted Al Ponzi Capital scheme in 2018, and recently the collapse of the London-listed the health care provider NMC Co. in 2019 associated with large transfers of cash and hidden debts. Third, strong block-holders traditionally dominate decision-making of firms and often adversely influence the directors' fiduciary duties and firm performance. An OECD (2014) report for the region identifies considerable corporate governance reform efforts but also considerable differences in implementation and enforcement. Fourth, the economies in the region have traditionally been cash-based ones. MasterCard International estimates that about 85–90% of retail transactions in the region use cash and checks (Rizvi, 2015). The 2018 Global Cash Index for the Middle East estimates that about 38% of transactions in selected countries are cash-based and that by 2021 the volume of cash payments will rise to USD 1.4 trillion. This cultural characteristic naturally influences financial contracting behavior. However, financial distress plays a role too. A recent PriceWaterhouseCoopers (PWC) (2018) estimates a staggering 31 USD billion of trapped liquidity in working capital (inventory, receivables and payables) for the MENA-listed firms. While both dividend payouts and capex spending have been at their 5-year lowest levels, liquidity are very low, due to high debt payment obligations. Finally, the region historically has a unique set of economic and social characteristics that comprise the predominance of Islamic values, social and political conflicts, a dominant role of the state and a distinctive geographical location (Darwisheh, 2014; Mertzanis and Allam, 2018). The sociopolitical developments of the last decade and the associated regional conflicts have led to a rise in uncertainty and forced the region to undergo considerable socioeconomic and institutional transformation. These developments affect general economic norms, regulatory frameworks and therefore the financial behavior of firms. The MENA region is considered 5by many accounts to be a unique study case (Khan, 2014).

Our article studies the effect of corporate governance and other firm-specific information on firms' liquidity decisions by combining various sources of data and placing a special emphasis on institutions. To examine these complementary research questions, our analysis takes a multi-level approach. First, we capture some institutional influence on firm liquidity on a consistent and more reliable basis using an accounting-based measure of liquidity that depends upon audited financial information reflecting the quality of the accounting and auditing standards in the region. Subsequently, we study the association between various firm-specific aspects of corporate governance and firm liquidity at the firm-level drawing on the insights provided by the empirical literature. Then, we apply sensitivity and endogeneity analysis to assess the robustness of our baseline results. Finally, we control for country-level effects to capture the impact of nonobservable economic and institutional factors that reflect the region's institutional and social environment. The results show that corporate governance can explain the firms' preference for liquidity in the MENA region. Specifically, the board size, board independence, board diversity and insider ownership strongly predict the firms' liquidity. In addition, institutional ownership appears to play an important role too. However, the corporate governance effect depends on the degree of economic development and firm size, and exhibits time sensitivity and nonlinearity. Macroeconomic, regulatory and institutional conditions as well as wider risk factors influence the corporate governance effect on firms' liquidity. Our results are in line with most international evidence but also differ in some important respects.

This study makes three contributions. First, it focuses on developing countries and especially on the under-researched and information-constrained MENA region, using a larger sample of firms that include more countries with combined firm-level information drawn from three databases for a 10-year period. Second, it takes a joined firm-level and country-level approach that distinguishes between poorer and richer MENA countries and uses disaggregated analysis, sensitivity testing and endogeneity analysis for assessing the robustness of the estimates. Third, using new information, the study analyses the influence of a variety of country-level economic, regulatory, enforcement, risk and institutional actors, including its social and religious heterogeneity. In this respect, the study takes a broader institutional perspective to the association between corporate governance and liquidity. It contributes to further elucidation of why firms hold cash in a traditional cash-based Arab society characterized by concentrated corporate ownership. An important policy implication of our results is the provision of guidance toward the effective switch from cash-based to digital transactions that the regional policymakers have already embarked upon.

We organize the study as follows. [Section 2](#) reviews briefly the relevant literature. [Section 3](#) identifies the source and nature of the data and the empirical strategy used in the analysis. [Section 4](#) analyzes the impact of the corporate governance and other characteristics of the firms on their decision to hold cash. [Section 5](#) expands the baseline model to account for the impact of country-level economic and institutional factors. [Section 6](#) concludes the study. Due to space restrictions, we add a [Supplementary material](#) that includes additional disaggregated analysis by firm size, sensitivity and endogeneity tests as well as additional country-level controls.

2. Related literature and hypothesis development

2.1 Theoretical framework

There are three key theories underlying the relation between corporate governance and firms' liquidity: the agency theory, the trade-off theory and the pecking-order theory. The agency theory contends that firms that have large amounts of free cash flows may suffer from agency conflicts if the cash ineffectively finances unprofitable projects. Managers may opt to stockpile cash in order to obtain discretionary power, leading to conflict between

shareholders and managers (Jensen, 1986). Chen (2008) argues that the managers have a higher chance of doing so in firms holding substantial amounts of free cash flows. The agency theory argues that managers should be held accountable against their strategic choice of using the cash to pay shareholders, undertake internal projects, finance corporate actions and takeovers or hold it in the firm (Harford *et al.*, 2008).

The trade-off theory strives to find the optimal level of cash by balancing the cost of running out of cash against the interest cost (Miller and Orr, 1966). The theory suggests that the firms, targeting an optimal level of cash, actually increase their market value by accounting for the marginal costs and benefits of cash holdings (Afza and Adnan, 2007; Ferreira and Vilela, 2004). Opler *et al.* (1999) add that the firm opts to hold cash when the marginal cost of cash shortage equals the marginal benefit of cash holdings. The balance depends on information asymmetry associated with the increasing cost of external finance against the agency cost of internal finance.

Finally, the pecking-order theory defies certain predictions of the trade-off theory (Myers, 1977; Myers and Majluf, 1984). This theory states that no optimal level of cash holdings exists and the firm decides on the level of cash-based on its investment needs. Firms follow a pecking-order in external financing to reduce the costs associated with information asymmetry. Firms initially use internal funds and then external funds, first through debt issuance and then through equity issuance. However, the empirical evidence on the validity of the pecking-order prediction is mixed. Dittmar *et al.* (2003) argue that cash holdings are the outcome of the different financing and investment decisions made by the pecking-order of financing and add that firms with an elevated level of cash holdings also include those that distribute dividends and use debt financing to store cash. The three theories provide alternative motives for firms to hold liquidity. Corporate governance and ownership are shared element of these theories. We briefly analyze their effects below.

2.2 Corporate governance and firm liquidity

The link between insider ownership, managerial behavior and liquidity varies. For example, Kuan *et al.* (2011) document that family-controlled firms maintain higher levels of liquidity relative to non-family ones. Chen (2008) finds that managerial ownership leads to lower liquidity in the new economy sectors (computers, Internet, telecoms and networks) and higher liquidity in the old economy sectors. Chen and Chuang (2009) find that CEO ownership and independent directors increase liquidity in high-tech firms. Kuan *et al.* (2012) find that in Taiwan a reduction in control rights is associated with either lower or higher liquidity, depending on its initial level. Azinfar and Shiraseb (2016) find that in Iran higher managerial ownership is associated with higher liquidity. Alghadi *et al.* (2021) document a positive relation between insider ownership and cash holdings of firms in Saudi Arabia. Ozkan and Ozkan (2004) found that family ownership positively affects cash holdings because firms hold excess cash to serve insider interests. Kusnadi (2011), Khalil and Ali (2015) and Liu *et al.* (2015) also document a positive association between family ownership and cash holdings in Asia, Pakistan and China, respectively. These results suggest that insider family ownership could monitor the firm's cash holding effectively, thus reducing agency problems. In the MENA countries, strong inside ownership and block-holders are the norm thereby strongly affecting financial decisions. Hence, our first testing hypothesis is:

H1. There is a positive association between insider ownership and liquidity.

Institutional ownership is a powerful monitor of corporate governance and financial decisions. However, it is not clear how better monitoring affects liquidity. La Porta *et al.* (2000) argue that better institutional monitoring would force self-serving managers to spend cash, resulting in lower holdings. Bushee (2001) distinguishes institutional investors among transient, quasi-index and dedicated investors, and finds that dedicated investors are

associated with higher long-term liquidity, while quasi-indexers use high diversification and low turnover trading practices and are therefore associated with lower liquidity. [Jebran *et al.* \(2019\)](#) argue that institutional ownership is associated with better long-term planning and better mitigation of the agency problems thereby reducing the level of required liquidity. In contrast, [Harford *et al.* \(2008\)](#) document a positive association between institutional ownership and liquidity in the USA. [Mohd *et al.* \(2015\)](#) document a positive association between institutional ownership and liquidity in India. Given the concentrated ownership structure and the associated strong formal and informal interaction between block-holders and managers of firms in the MENA countries, it is more likely that institutional ownership is associated with less pronounced internal conflicts of interest and therefore lower liquidity. Hence, our second testing hypothesis is:

H2. There is a negative association between institutional ownership and liquidity.

Foreign investors represent an effective monitor of managerial efficiency. Foreign ownership affects the cash holding decisions of firms by reducing financing constraints, demanding a higher dividend payout policy and reducing agency costs via enhanced monitoring ([Pinkowitz *et al.*, 2008](#); [Bokpin and Isshaq, 2009](#)). However, the evidence is mixed. [Ward *et al.* \(2017\)](#) document a positive association between foreign ownership and liquidity that depends on the degree of monitoring. [Azinfar and Shiraseb \(2016\)](#) find a significant and positive association between foreign ownership and liquidity, as foreign investors lead firms to hold more cash for precautionary purposes and for agency conflict mitigation. [Vo \(2018\)](#) finds a positive association between foreign ownership and liquidity in Vietnam. In contrast, [Ullah *et al.* \(2018\)](#) find a negative association between foreign ownership and liquidity, indicating that foreign investors prefer the cash dividend than the capital gain. [Loncan \(2020\)](#) studies 23 emerging economies during 2006–2015 and finds that ownership by foreign institutions affects negatively the holding of cash and increases the importance of cash in market valuation of the firm. [Mugableh \(2021\)](#) documented a negative relation between foreign ownership and cash holdings of Jordanian firms during 2009–2020. However, [Al-Najjar and BinSaddig \(2013\)](#) found a weak relation between foreign ownership and cash holdings in Saudi Arabia. The MENA countries are mostly developing countries characterized by considerable uncertainty conditions and therefore foreign owners would prefer a higher cash dividend at the face of high market volatility. Hence, we predict the following:

H3. There is a negative association between foreign ownership and liquidity.

The structure and functions of the board are a crucial internal corporate governance mechanism. In particular, the separation of the powers and functions of the Chairman and the CEO in the firm could better mitigate agency costs due to the effective separation between management decisions (execution of projects) and corporate control decisions (authorization and monitoring of projects). CEO duality influences the effectiveness of board monitoring because CEOs are in an advantageous position to acquire superior knowledge about the firm. Entrenched CEOs can manage critical information needed to assess their effectiveness. The information effect is stronger at the presence of CEO duality. Empirical studies report strong evidence that CEO duality impairs the board's monitoring function. [Kim *et al.* \(2007\)](#) find that diversification strategies of firms with CEO duality often tend to reduce market value. [Gul and Leung \(2004\)](#) show that CEO duality leads to lower voluntary disclosure of information because opacity better serves the goals of managerial entrenchment. Thus, CEO duality encourages controlling shareholders to maintain high levels of liquidity. [Cambrea *et al.* \(2020\)](#) show a CEO duality is associated with higher firms' liquidity, especially in uncertain times. [Ajanthan and Kumara \(2017\)](#) document a positive association between CEO duality and liquidity in Sri Lanka. Hence, our hypothesis in our MENA setting is:

H4. There is a positive association between CEO duality and liquidity.

The size of the board affects corporate decision-making. However, there is little consensus on what constitutes an optimal board size. Empirical studies have shown that the firms with smaller boards tend to get better market valuation (Eisenberg *et al.*, 1998) and experience a lower risk of excessive managerial power and entrenchment (Cheng, 2008). Large boards are associated with a higher possibility of managerial misappropriation and therefore firms with large boards tend to maintain lower liquidity. The empirical evidence provides some support. Staikouras *et al.* (2007) document an inverse association between the size of the board of the European banks and their holding of cash reserves. In contrast, Huang (2010) finds a positive association between the size of the board and the holding of cash in the manufacturing industry in Taiwan. MengYun *et al.* (2021) document a negative relation between board expertise and firm liquidity in Pakistani firms. Cambrea *et al.* (2020) show a negative association between board size and cash holdings, which is more pronounced in uncertain times. In conditions of concentrated ownership, the firm's choice of a small board enhances the dominant position of the controlling shareholders, who perform monitoring and managerial roles but also could make inefficient use or misappropriate cash. In the latter case, firms may be forced to maintain larger portions of cash to serve private benefits of control. Given that most firms in the MENA region have concentrated ownership and rather small (less transparent and representative) boards, we conjecture that they will be included to maintain higher levels of cash for private benefits. Hence, our testing hypothesis is:

H5. There is a negative association between board size and liquidity.

Active and independent directors help the board perform its monitoring function effectively because they contribute independent judgment and knowledge, and they are less subject to executive influence. This possibility encourages the bringing of outsiders in the board, who do not have prior professional or kinship associations with management or other financial interests within the firm (Adams *et al.*, 2010). The personal interests of independent directors are linked to maintaining their reputation and expertise quality in the corporate director market (Fama, 1980; Choi *et al.*, 2020). Competition among independent directors regarding compensation and employability encourages their exercise of effective monitoring of management actions. In conditions of concentrated ownership, the independent directors can protect the interests of minority shareholders, who have few ways and means to exercise control (Kim *et al.*, 2007). Thus, the existence of independent directors reduces potential conflicts of interest in decision-making and makes the board fairer and more efficient. However, the empirical evidence is equally mixed. Aspris and Frino (2015) find a positive association between board independence, liquidity and market value for US firms. Anderson *et al.* (2004) document a negative association with respect to the cost of debt. They further argue that, since large liquidity increase expropriation risk, firms with many independent directors reduce managerial discretion and the level of free cash flow and therefore will tend to have lower liquidity. Cambrea *et al.* (2020) show that more independent corporate boards are associated with lower liquidity in Italian firms, especially in times of crisis. Belghitar and Khan (2013) show that firms with higher growth opportunities and independent directors owning shares have lower cash holdings. Bhuiyan and Hooks (2019) find that higher board independence, to the extent that it is associated with better quality directors, leads to lower liquidity of firms. Ajanthan and Kumara (2017) find that the share of independent directors in the board is weakly associated with cash holdings of firms in Sri Lanka. Therefore, in the highly uncertain MENA context, our testing hypothesis is:

H6. There is a negative association between board independence and liquidity.

Due to cognitive and psychological differences, board diversity influences corporate decision-making. For instance, women are more likely to debate issues (Ingleby and van Der Walt,

2005), raise questions (Bilimoria and Wheeler, 2000), adhere to ethical standards and resist unethical business practices (Pan and Sparks, 2012). Francoeur *et al.* (2008) conclude that board minorities, such as women, ethnicities and foreigners, contribute fresh perspectives on complex matters that can help contain information asymmetries. The evidence is also mixed. On the one hand, Zeng and Wang (2015) and La Rocca *et al.* (2019) find a positive association between women CEOs and the holding of cash in firms. Atif *et al.* (2019) find a positive association between the percent of women on boards and the holding of cash. On the other hand, Alves *et al.* (2015) argue that gender diversity in the board improves the quantity and quality of disseminated information thereby reducing uncertainty and cash holdings. Gul *et al.* (2011) find that firms with more women in the board make more public disclosures, thereby reducing information asymmetry and therefore the need for higher liquidity (Srinidhi *et al.*, 2011). Moreover, since women are on average more risk-averse than men, they are less likely to support risky strategies. Thus, women directors are expected to give more weight to risk factors and, since cash is a proxy against risk, they will tend to prefer more cash. Eagly and Sczesny (2019) notes that gender matters for determining the style of business conduct and influence effectiveness. Women tend to exhibit more “feminine” behavior, i.e. being more accommodating, sympathetic to differences and interpersonally sensitive. These characteristics imply that performing tight controlling, constant strict monitoring and assuming disproportionate risk-taking, do not fit much the inner behavior of women directors, which would imply a preference for higher liquidity. These findings provide the following testing hypothesis in our MENA setting:

H7. There is a negative association between board diversity and liquidity.

3. Data and empirical strategy

We carry out the analysis by drawing on a unique set of panel data comprising 218 non-financial firms, whose shares are traded on the stock exchanges in countries in the MENA region. We obtain the firm-level accounting data from the audited financial statements and the annual reports of firms through the ORBIS database and the corporate governance data from the BoardEx database. Our basic sample includes a total of 2,425 country-year observations. However, some firms have fewer years of available observations and some observations for the dependent variable are missing. As a result, the number of effective country-year observations is reduced to 1,518. We performed winsorization on the data for certain variables, specifically at the 1st and 99th percentiles to mitigate the impact of outlier values. In addition, we also obtain new information from the Organization of Economic Cooperation and Development (OECD) (Amico, 2014) on corporate governance regulation and enforcement practices in the MENA region. We merged the three sources of information along with additional country-level information to obtain an integrated dataset. Our final sample includes complete information of firms' characteristics and activity in 11 MENA countries (Bahrain, Egypt, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Saudi Arabia, Tunisia and United Arab Emirates) during 2008–2017. Some MENA countries are not included because either they do not have active exchanges and hence market information or there are many missing observations. Using our combined data, we analyze the effect of ownership structure (hypotheses H1 to H3) and board structure (hypotheses H4 to H7) on liquidity, taking account of the role of institutions.

In our analysis, we follow standard practice and our outcome variable on cash holdings (LIQUIDITY) is the ratio of cash and other liquid assets over total assets, as stated in the firms' audited financial statements (Opler *et al.*, 1999; Harford *et al.*, 2008; Ferreira and Vilela, 2004). While accounting data drawn from financial statements present objective secondary information that permits analysis replication, we caution that in developing countries there is some difficulty in relying on information from firms' annual reports or other interim financial

statement, due to their questionable quality. Claessens and Tzioumis (2006) argue that balance sheet information in many developing countries is of low quality and often inconsistent. A recent ICAEW (2020) report emphasizes that the accounting measures of firm performance and liquidity are often institutionally laden and subjected to various noneconomic influences. Shleifer (2019) stressed that survey data could be an alternative and perhaps more credible source of information for assessing market expectations. Table 1 reports the sample countries and the average values of LIQUIDITY per country. The data show considerable diversity in firms' liquidity among the MENA countries. The average proportion of firms' liquidity in our sample countries is 2.12% exhibiting moderate dispersion. Overall, firms in Morocco have the highest liquidity with a mean of 2.48% while firms in the UAE have the lowest liquidity with a mean of 1.71%.

Following previous studies (Opler *et al.*, 1999; Bates *et al.*, 2009; Guizani and Ajmi, 2021), we use several characteristics of the firm's corporate governance and ownership as predictors. These include board size, independence and diversity, CEO duality, as well as ownership by corporate insiders, foreign and institutional investors. Further, since the effect of these corporate governance characteristics is largely unobservable, we follow Dittmar *et al.* (2003) and Harford *et al.* (2008), among others, and consider the effect of firm age, size and size growth, leverage and performance, based on available data, to account for differences among firms. Moreover, we use country-level control factors to account for the effect of significant economic and institutional influences at the national level. These control factors capture the role of unobservable country influences and account for potential spurious bias. They account for the effect of the economic environment and the institutional environment. The coefficient estimates reflect the country-level differences in the association between the various measures of corporate governance and the measure of firm liquidity preference. We assume that each firm is exceedingly small to individually influence country-level conditions. Appendix provides detailed information on all variables used in the analysis.

Table 2 shows the descriptive statistics of the variables. These statistics show considerable variation among countries. The board of directors has an average size of 8 members with a maximum of 19 and a minimum of 4 members. The share of nonexecutive directors in the board is on average 54% with a maximum of 100% and a minimum of 0%. Thus, not all the firms adopt good governance practices by appointing nonexecutive directors. The CEO duality in the sample is extremely high with an average of 96%. The average share of insider ownership is 6%, of foreign ownership is 7% and of the institutional ownership is 36%. All ownership variables have a maximum of 100% and a minimum of 0%. Most firms included in the sample are young with an average age of 3.04 years and a maximum of 5.09 years. Firms that rely less on debt finance, with an average degree of

Table 1.
Liquidity per MENA
country (mean
percent value)

Country (firms)	Obs	Mean	SD	Median	Min	Max
Bahrain (4)	29	0.021	0.010	0.018	0.009	0.043
Egypt (20)	141	0.018	0.014	0.014	0.004	0.088
Jordan (6)	40	0.022	0.019	0.013	0.006	0.083
Kuwait (24)	166	0.020	0.024	0.013	0.002	0.170
Lebanon (2)	12	0.018	0.004	0.016	0.012	0.025
Morocco (7)	47	0.025	0.034	0.010	0.004	0.147
Oman (20)	141	0.021	0.019	0.014	0.001	0.115
Qatar (18)	125	0.021	0.017	0.017	0.004	0.108
Saudi Arabia (91)	635	0.023	0.021	0.016	0.001	0.163
Tunisia (12)	82	0.020	0.034	0.014	0.003	0.115
United Arab Emirates (14)	100	0.017	0.013	0.013	0.001	0.070
Total average (218)	1,518	0.021	0.019	0.014	0.004	0.102

Variable	Obs	Mean	SD	Min	0.25%	Mdn	0.75%	Max	Corporate governance in the MENA region
LIQUIDITY	1,518	0.021	0.019	0.001	0.011	0.014	0.025	0.17	
BRDSIZE	1,518	2.10	0.27	1.39	1.95	2.08	2.30	2.89	
BRDINDP	1,518	0.54	0.23	0.00	0.36	0.50	0.71	1.00	
BRDDIVR	1,518	0.03	0.07	0.00	0.00	0.00	0.00	0.40	
CEODUALTY	1,518	0.96	0.19	0.00	1.00	1.00	1.00	1.00	
OWNNSDR	1,518	0.06	0.14	0.00	0.00	0.00	0.06	1.00	
OWNINSTL	1,518	0.36	0.30	0.00	0.07	0.33	0.60	1.00	
OWNFORG	1,518	0.07	0.13	0.00	0.00	0.00	0.00	1.00	
FRMAGE	1,518	3.04	0.77	0.69	2.48	3.14	3.58	3.95	
FRMSIZE	1,518	13.49	1.57	9.62	12.41	13.38	14.36	18.59	
FRMSIZEGR	1,518	0.07	0.25	-0.84	-0.03	0.03	0.13	4.42	
FRMLEVERG	1,518	0.44	0.22	0.02	0.25	0.43	0.60	0.91	
ROA	1,518	0.07	0.09	-0.84	0.02	0.06	0.11	0.44	
CREDIT	1,518	3.94	0.32	3.24	3.67	3.95	4.17	4.73	
GDPCAP	1,518	0.35	0.23	0.04	0.18	0.18	0.63	0.75	
INFLATION	1,518	0.23	0.20	0.01	0.13	0.13	0.33	0.79	
LEGRIGHT	1,518	1.66	0.58	0.00	1.00	1.92	2.00	3.00	
DIRLIAB	1,518	3.58	0.83	1.81	3.00	3.84	4.00	6.00	
DISCLOS	1,518	5.39	1.35	3.62	4.52	5.00	6.00	9.00	
RULAW	1,518	0.23	0.35	-0.86	0.05	0.16	0.47	0.96	
REGULATOR	1,518	1.18	0.18	0.78	1.15	1.15	1.28	1.58	
COMLEXPL	1,518	0.72	0.45	0.00	0.00	1.00	1.00	1.00	
FRACETHN	1,518	0.47	0.07	0.30	0.46	0.50	0.50	0.55	
FRACLNG	1,518	0.01	0.00	0.01	0.01	0.01	0.01	0.01	
FRACRLG	1,518	0.05	0.04	-0.05	0.03	0.04	0.06	0.19	
CORPETHC	1,518	4.87	0.60	2.91	4.43	5.00	5.16	6.02	

Table 2.
Descriptive statistics of the variables

leverage of 44%, generate an average return on assets of 7% and realize an average growth of assets of 7%.

We fit an Ordinary Least Squares (OLS) regression model with fixed-effects to estimate the coefficients (Greene, 2012). The disadvantage of the OLS linear estimation is that it does not account for nonlinearities, has poor extrapolation properties, is sensitivity to outliers, and it may produce too low predicted values for the outcome variable, due to attenuation bias. However, the OLS estimation avoids the problem of incidental parameter bias that is embedded in nonlinear estimations using country-year fixed-effects. The inclusion of country-year fixed-effects (Hausman value = 2.94; p -value = 0.000) in the analysis contains the OLS estimation bias. We further apply sensitivity and endogeneity tests for obtaining robust estimates. We run the regressions using Stata 16.1, and we consider only nonmissing observations of our variables. We use country and year fixed-effects to capture time-invariant and time-varying heterogeneity. When we study the impact of the firm-level determinants only on firm liquidity, we calculate robust standard errors. When we extend the analysis to capture unobservable country-level effects that might cause the error terms to be correlated among firms within each country, we cluster standard errors at the country-level to control for Moulton's (1986) critique on potential bias resulting from regressing firm-level variables on aggregate country-level variables. Our estimation model posits that the following regression equation shows the decision function of firms to hold cash:

$$y_{ijt} = \alpha + X_{1ijt}\beta_1 + X_{2jt}\beta_2 + \mu_{ijt} \quad (1)$$

where y_{ijt} is the degree of LIQUIDITY reported in the financial statements of firm i in country j in year t ; X_{1ijt} is the vector that includes the corporate governance and other characteristics of

firm i in country j in year t ; and X_{2jt} is the vector that includes the country-level economic and institutional control factors in country j in year t . The final term μ_{ijt} represents the composite error term of the regression that comprises the sum of γ_i , δ_t and ε_{ijt} , where γ_i accounts for the influence of country effects, δ_t accounts for the influence of year effects, and the ε_{ijt} is the error parameter assumed to vary across firms, years and countries and be normally distributed. We recognize the problem of interpreting the estimated correlations as causation. Therefore, we interpret our estimates as power of association rather than outright causation and we use the expressions “impact” or “predict” only for textual exposition. Table 3 reports the correlations between the characteristics of the firms taken pairwise. The results indicate small values of the correlations (<0.5), which implies very low potential collinearity problems. Hence, we include them all in the regression.

4. Analysis of the results

The results of the regression report the estimated marginal effect of a unit change in the firm-specific corporate governance characteristics on the liquidity of firms. In order to account for country development effects, we distinguish between low-income countries and high-income countries within the region, based on the median value of GDP per capita. Table 4 reports the estimates of the baseline regression. We estimate several models to analyze the association. Models (1) to (5) analyze the impact of each corporate governance characteristic separately on firms' liquidity. Models (6) to (8) analyze the impact of all corporate governance factors on firm's liquidity for the whole sample and separately for high-income countries and low-income countries. The results show that in all estimation models board size, independence exerts a negative and significant impact on the firms' holding of cash. Thus, the larger and more independent the structure of the board is, the lower is the liquidity in the firm. Board diversity also exerts a negative effect, except in low-income countries, where the effect is positive. Higher board diversity is associated with lower levels of liquidity only in more developed markets. However, the size of these effects differs. The board size effect is much stronger in low-income countries; the board independence effect does not vary much between the groups of countries, while the effect of board diversity differs: it is stronger and negative in high-income MENA countries, and weaker and positive in low-income countries. It appears that in the MENA context larger boards with more independent directors face a lower risk of managerial misappropriation and therefore are associated with lower liquidity. This evidence is in line with that of Staikouras *et al.* (2007) for EU banks and of Al-Najjar and Clark (2017) for MENA firms. Moreover, more diversified boards exert more efficient monitoring, which leads to lower liquidity in firms in the more developed MENA countries but not so in the less developed ones. This evidence contradicts the findings of Zeng and Wang (2015) and La Rocca *et al.* (2019) who document a positive association but is in line with the predictions of the psychological approach to women's role in decision-making that emphasizes the reduction of information asymmetry and transaction costs. For example, given that liquidity decisions are driven by different motives (precautionary versus transactional motive), it may be the case that in low-income countries, risk factors are more important making women directors more conservative cash managers, and therefore higher board diversity is associated with higher liquidity. Moreover, in low-income countries, firms that choose to separate the roles of the CEO and the Chair are associated with higher cash holdings. Finkelstein and D'Aveni (1994) show that in weak institutional environments, firms with low liquidity levels often feel the pressure to strong top management structures to steer corporate strategies more effectively. With respect to the ownership structure, our results show that insider ownership is associated with lower liquidity in low-income countries, but a higher one liquidity in high-income ones. This result contradicts the free cash flow theory (Jensen, 1986) and confirms the view that high insider ownership provides better control and monitoring of the firm associated with a lower risk of

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
LIQUIDITY (1)	1												
BRD SIZE (2)	-0.02	1											
BRDNDP (3)	-0.02	0.11***	1										
BRDDIVR (4)	-0.07***	0.22***	-0.00	1									
CEODUALTY (5)	0.05**	-0.08***	-0.07**	-0.35***	1								
OWNINSDR (6)	-0.06**	-0.13***	-0.04	0.02	-0.29***	1							
OWNINSTL (7)	-0.05**	0.19***	0.03	0.09***	0.09***	-0.30***	1						
OWNFORG (8)	-0.10***	0.16***	0.08***	0.14***	0.01	-0.07***	0.38***	1					
FRMAGE (9)	0.08***	0.12***	-0.10***	0.03	-0.00	0.08***	0.03***	0.05*	1				
FRMSIZE(10)	-0.23***	0.17***	0.02	-0.07***	0.05***	-0.19***	0.35***	0.13***	-0.15***	1			
FRMSIZEGR (11)	-0.02	-0.02	0.00	-0.03	-0.01	0.03	-0.03	-0.03	-0.11***	0.07***	1		
FRMLEVERG (12)	-0.32***	-0.02	-0.08***	0.05*	-0.03	0.07***	0.09***	0.20***	-0.17***	0.37***	0.09***	1	
ROA (13)	0.26***	0.13***	-0.05*	0.08***	0.01	0.02	0.11***	-0.00	0.12***	-0.11***	0.11***	-0.36***	1
VIF	1.30												
N	1,518												

Note(s): The table reports the pairwise correlations for the variables for nonmissing observations. It also provides the Variance inflation factor (VIF) mean value. VIF values above 4 for small samples indicate collinearity. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 3.
Correlation matrix of
the regressors

Table 4.
Corporate governance
and liquidity - Baseline
models

LIQUIDITY	Board size (1)	Board independence (2)	Board diversity (3)	CEO duality (4)	Ownership structure (5)	All countries (6)	High-income countries (7)	Low-income countries (8)
BRDSIZE	-0.052*** (0.011)					-0.047*** (0.010)	-0.031** (0.012)	-0.106*** (0.035)
BRDINDP		-0.656*** (0.166)				-0.697*** (0.166)	-0.825*** (0.268)	-0.749*** (0.266)
BRDDIVR			-1.654*** (0.387)			-1.537*** (0.366)	-2.056*** (0.536)	0.920* (0.519)
CEODUALTY				0.289*** (0.091)		-0.064 (0.099)	0.095 (0.138)	0.359* (0.216)
OWNINSDR					-0.626*** (0.097)	-0.684*** (0.104)	1.251*** (0.303)	-1.945*** (0.183)
OWNINSTL					-0.102* (0.091)	-0.125* (0.070)	0.365*** (0.113)	-0.628*** (0.114)
OWNFORG					0.019 (0.291)	-0.022 (0.292)	-0.558* (0.295)	1.009 (0.799)
FRMAGE	-0.043 (0.031)	-0.067** (0.031)	-0.056* (0.030)	-0.050 (0.031)	-0.034 (0.031)	-0.058* (0.030)	-0.015 (0.052)	0.008 (0.064)
FRMSIZE	-0.046* (0.028)	-0.060** (0.028)	-0.059*** (0.028)	-0.060** (0.029)	-0.060* (0.032)	-0.057* (0.029)	-0.144** (0.058)	0.017 (0.020)
FRMSIZEGR	0.151 (0.186)	0.175 (0.178)	0.156 (0.183)	0.173 (0.182)	0.174 (0.183)	0.166 (0.190)	0.013 (0.124)	0.386* (0.230)
FRMLEVERG	-4.382*** (0.182)	-4.461*** (0.185)	-4.344*** (0.181)	-4.352*** (0.184)	-4.275*** (0.201)	-4.394*** (0.196)	-4.016*** (0.286)	-4.649*** (0.333)
ROA	1.836*** (0.676)	1.524** (0.661)	1.766*** (0.676)	1.690** (0.674)	1.843*** (0.630)	1.840*** (0.657)	2.815*** (0.801)	1.248 (0.830)
Year effects	0.292	0.293	0.291	0.290	0.290	0.300	0.341	0.294
Country effects	1.668	1.666	1.668	1.671	1.664	1.662	1.616	1.686
R ² _{overall}	0.292	0.293	0.291	0.290	0.290	0.300	0.341	0.294
Sigma _e	1.668	1.666	1.668	1.671	1.664	1.662	1.616	1.686
N	1,518	1,518	1,518	1,518	1,539	1,518	757	761

Note(s): The parentheses report the robust standard errors of the coefficients in the regressions. Columns 1 to 5 present the marginal effect of each corporate governance characteristic on firm liquidity. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

misappropriation especially in firms operating in poorer countries. These results are in line with those of [Jebran et al. \(2019\)](#). However, insider ownership in high-income countries is associated with higher liquidity. The latter countries have better regulations that contain misappropriation risk. Moreover, institutional ownership is associated with lower liquidity mainly in low-income countries and higher liquidity in high-income countries. This evidence is only partly in line with that of [Mohd et al. \(2015\)](#) and reflects the different investment horizons used by institutional investors while investing in the different MENA countries. Foreign ownership is a significant and negative determinant of firms' liquidity only in high-income countries, reflecting the specific strategies of foreign direct and other investment. In order to examine the robustness of our baseline estimates, we apply further disaggregated analysis by firm size, sensitivity tests and endogeneity analysis, which confirm the baseline results (see [Supplementary material](#)). More generally, our findings appear to be in line with the view that firms operating in countries with weak investor protection may experience higher risk of misappropriation ([Dittmar et al., 2003](#); [Easterbrook, 1984](#)). In these environments, better corporate governance (e.g. more representative, independent and diverse boards) implies lower liquidity especially for less developed countries.

5. Further robustness checks

The specific corporate governance characteristics of the firms may not explain adequately the liquidity decisions of firms. Other factors may be important too. For example, different countries are at distinct phases of economic development and have different institutional and regulatory structures. We apply more robustness tests to assess the impact of these conditions and institutions. However, given the complex and interdependent nature of country-level factors, potential collinearity problems may exist, which leads us to conduct estimation using separate groups of control variables. We expand and estimate again [Equation \(1\)](#) to assess, separately, the effect of the financial and macroeconomic conditions; the financial regulation conditions and the corporate governance enforcement conditions in the MENA countries. [Appendix](#) describes the corresponding variables.

First, macroeconomic conditions affect corporate governance and firm liquidity through uncertainty and the availability of investment opportunities and funds. [Baum et al. \(2008\)](#) find that macroeconomic uncertainty affects firms' holding of cash, depending upon the nature of the data, the industry and the period used. [Chen and Mahajan \(2010\)](#) document that macroeconomic factors affect the firms' holding of cash (see also [Guizani and Ajmi, 2021](#)). We expand the model of [Equation \(1\)](#) to include regressors that account for the role of financial development (CREDIT), economic development (GDPCP) and inflation (INFLATION).

Further, financial regulation affects the internal organization and governance of firms and thereby their liquidity. Unregulated financial distress affects the liquidity decision of the firm ([Almeida et al., 2004](#); [Harford et al., 2008](#); [Opler et al., 1999](#); [Mertzanis et al., 2019](#)). Managers of financially distressed firms have lower access to external finance and hence hold higher cash to meet liabilities. Strong corporate governance can ease financing constraints thereby affecting cash management ([Lee and Park, 2016](#)). [Kusnadi \(2011\)](#) find that firms working in countries with strong legal systems exhibit a lower sensitivity of liquidity to cash flow. [Ferreira and Vilela \(2004\)](#) find that concentrated ownership and better investor protection limit managerial discretion and are associated with lower liquidity. [Bick et al. \(2018\)](#) find that firms with high intensity of total fair value assets and liabilities tend to hold more cash, especially when managers are powerful. We expand [Equation \(1\)](#) to include regressors accounting for the role of the strength of legal rights (LEGRIGHT), the degree of business disclosure (DISCLOS) and the degree of director liability (DIRLIAB) in the MENA countries.

Moreover, corporate governance institutions vary across countries affecting enforcement efficiency. Adherence to the rule of law, the overall effectiveness of the judicial system in

resolving conflicts and contract violations, the experience of the regulator and the balance between voluntary versus mandatory compliance are key elements of the enforcement environment (Jackson and Roe, 2009). Boubakri *et al.* (2013) found that politically connected firms tend to hold more cash than politically unconnected firms do. At the presence of lax corporate governance enforcement conditions, politicians use these firms to finance their personal political agendas. We expand Equation (1) to include regressors accounting for the role of the rule of law (RULAW), the supervisory experience of the regulator (REGULATOR), and whether the applicable corporate governance code in the country includes the clause “comply-or-explain” (COMPLEXPL).

Finally, social conditions affect the financing behavior of firms. Coffee (2001) argued that social norms rather than legal rules often determine corporate behavior. Alesina *et al.* (2003) argue that heterogeneity (fractionalization) in society is an important determinant of political stability, quality of institutions and economic policy effectiveness, thereby influencing corporate behavior. La Porta *et al.* (2000) argue that different religions are associated with diverse hierarchical social norms, which affect perceptions of representation, social equality and fairness thereby affecting financial decisions and the nature of financial contracting. We expand Equation (1) to include regressors accounting for the role of ethnic fractionalization (heterogeneity) in society (FRACETHN), linguistic fractionalization (FRACLNG) and religious fractionalization (FRACRLG).

Table 5 presents the results. They show that the corporate governance characteristics remain significant predictors of liquidity, except for CEO duality, which is insignificant. The control variables are also significant throughout. Higher levels of financial and economic development are associated with higher liquidity, while higher inflation is associated with lower liquidity. Myers and Majluf (1984) note that, despite the size of the financial sector, financial market imperfections, in the form of information asymmetry, and higher financing costs increase the cost of external financing, leading firms to hold more cash. Inflation erodes the purchasing power of cash and therefore leads to lower liquidity (Chen and Mahajan, 2010). Overall, it appears that macroeconomic conditions appear to influence the effect of corporate governance on the firms’ liquidity (Baum *et al.*, 2008). Further, the institutions governing legal rights and director liability are significant, but financial disclosure does not appear to affect the firm’s holding of cash. Das Gupta and Pathak (2021) show that the origin of the legal system in a country affects the cash flow decisions of firms. Acemoglu *et al.* (2003) argue that weak legal rights in a country are associated with financial underdevelopment, thereby raising the cost of nonliquid assets. Moreover, the weaker the rule of law and the more experienced the regulator, the higher the level of cash held by the firms. In emerging markets, weaker rule of law is associated with higher political uncertainty (as is evident in the MENA region), which induces firms to hold more cash driven by both speculative (Almeida *et al.*, 2004) and precautionary motives (Bates *et al.*, 2009). When the regulatory efficiency is higher, the agency cost of free cash flow declines and firms are allowed to hold more cash for carrying out corporate investment (Huang *et al.*, 2013). An experienced regulator is more effective in mitigating the risk of fund misappropriation by managers thereby encouraging the holding of cash by firms in environments with high information asymmetries, such as the MENA region. The stronger the “comply-or-explain” clause in the codes of corporate governance, the higher the compliance of firms to best governance practices and therefore the lower is the possibility of misappropriation risk. This leads firms to hold more cash. Chen *et al.* (2020) analyze the effect of board reforms and find that comply-or-explain reforms result in smaller cash reductions than mandated, rules-based reforms. Finally, higher ethnic and religious fractionalization in society is associated with higher liquidity. Higher heterogeneity in society regarding ethnicity and religious beliefs intensifies risk perceptions leading to higher liquidity. Moreover, ethnically and religiously heterogeneous societies experience more frequent internal conflict and uncertainty, which intensifies the firms’ precautionary motive due to lower social trust. Indeed, Myers and Majluf (1984) argue that lower social trust produces information asymmetries,

LIQUIDITY	Corporate governance in the MENA region			
	Macroeconomic conditions	Financial regulation conditions	Enforcement conditions	Social and religious conditions
BRDSIZE	−0.048*** (0.010)	−0.047*** (0.010)	−0.047*** (0.010)	−0.012*** (0.021)
BRDINDP	−0.689*** (0.164)	−0.698*** (0.168)	−0.683*** (0.166)	−0.234*** (0.164)
BRDDIVR	−1.637*** (0.366)	−1.577*** (0.360)	−1.593*** (0.386)	−1.128*** (0.214)
CEODUALTY	−0.067 (0.095)	−0.054 (0.094)	−0.059 (0.098)	−0.067 (0.125)
OWNINSDR	−0.687*** (0.112)	−0.708*** (0.109)	−0.708*** (0.114)	−0.335*** (0.067)
OWNINSTL	−0.130* (0.076)	−0.121 (0.074)	−0.130* (0.072)	−0.025* (0.023)
OWNFORG	0.021 (0.305)	−0.011* (0.316)	0.032* (0.304)	0.034 (0.451)
CREDIT	0.526** (0.231)			
GDP CAP	1.036*** (0.231)			
INFLATION	−3.098*** (0.752)			
LEGRIGHT		−2.886** (1.239)		
DISCLOS		0.029 (0.045)		
DIRLIAB		−0.078** (0.031)		
RULAW			−0.141* (0.235)	
REGULATOR			4.162*** (1.222)	
COMLEXPL			1.101** (0.479)	
FRACETHN				0.324** (0.294)
FRACLNG				0.067 (0.118)
FRACRLG				0.238*** (0.366)
Firm characteristics	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes
Country effects	Yes	Yes	Yes	Yes
R ² _{overall}	0.298	0.277	0.295	0.297
Sigma _e	1.645	1.666	1.656	1.654
N	1,518	1,518	1,518	1,518

Note(s): The parentheses report the clustered standard errors of the coefficients in the regressions clustered at the country-level. The control variables include macroeconomic conditions, financial regulation conditions, corporate governance enforcement and social heterogeneity conditions. For space reasons, we report only the firm-level corporate governance effects

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 5.
Impact of country-level factors

which increases the precautionary reactions of firms. Guiso *et al.* (2008) argue that in societies with lower trust, firms are less likely to seek external financing through the stock market. Moreover, Hu *et al.* (2019) find that firms operating in high concentration Protestant areas tend, due to higher risk aversion, to hold more cash. Cheung (2016) use Corporate Social Responsibility (CSR) activities to measure trust, conflict and social capital and find that firms with higher CSR activities tend to hold lower levels of cash due to lower systematic risk and uncertainty effects. While the aforementioned country-level factors appear to be significant mediators of the liquidity effect, they are by no means the only important ones. We further consider the effect of risk factors, including the Arab Spring effect, on the firms' decision to hold cash (Supplementary material and associated analysis).

6. Conclusions

Our article studies the effect of corporate governance on firms' liquidity by using firm-specific information from different data sources and placing a special emphasis on institutions. The results show that the corporate governance characteristics are significant predictors of firms' liquidity. However, the effect differs according with the firms' size and country development. Overall, the association between corporate governance and liquidity of firms in the MENA region tends to conform to observed international patterns, but it also deviates from them in important respects.

The role of regulatory and enforcement institutions and social structures appears to be important. Regulatory and enforcement institutions contribute to the protection of property rights and the contain investment risks, thereby enhancing investment in human and physical capital and fostering corporate competitiveness and growth. In this respect, our results are broadly in line with the empirical literature regarding the important role of the institutions and finance approach to corporate governance (Bhagat and Hubbard, 2022). Our results have a MENA-wide focus and therefore reflect diverse local practices and influences. International comparisons of regulations contribute to the understanding of the economic and noneconomic factors that affect governance structures and their implications for the financial decisions of firms. The regulatory institutions in the MENA region have improved in recent years, but they still lag behind in some important respects.

Given that financial contracting arrangements in the MENA countries have traditionally been cash-based, our results provide some guidance into the ongoing efforts by local policymakers to move economic operations into the digital era as well as to regulators and loan providers. Institutions, regulatory policies and uncertainty appear to matter and must be accounted for in corporate liquidity decisions. Regulatory experience and corporate governance compliance appear to influence corporate liquidity policies. Finally, social conflict and heterogeneity, which are observed in the MENA region, appear to influence the general level of uncertainty and thereby corporate liquidity policy.

Our analysis has certain limitations. It needs to use a larger sample of firms in the region and consider the effect of other institutional factors that are important in the region (e.g. digitization). Moreover, it also uses an accounting measure of firms' liquidity, which captures their decision to hold cash. The analysis could be extended to capture trading-based liquidity effects by using market-based measures of liquidity that reflect trading efficiency conditions in the region. Future research should better account for the effects of recurrent uncertainty in the region, of the recent economic transformation policies (i.e. digitization), and of the improving accountability practices, including employees, customers and society at large through ESG (environmental, social and governance) measures.

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Name	Description and source
<i>Firm-level outcome variable</i>	
LIQUIDITY	Ratio of cash and other liquid assets to total current liabilities, based on information provided in the firms' financial statements, from the ORBIS database (Bureau van Dijk, https://www.orbis.bvdinfo.com)
<i>Firm-level corporate governance variables</i>	
BRDSIZE	Logarithm of number of corporate directors in the firm's board, from the BoardEX database (www.boardex.com)
BRDINDP	Ratio of the number of corporate nonexecutive directors over the total number of corporate directors in the board, from the BoardEX database
BRDDIVR	Ratio of female corporate directors in the board over the total number of corporate directors in the board, from the BoardEX database
CEODUALTY	Binary variable that takes the value of 1 if there is a separation between the roles of the chief executive officer (CEO) and the chairman of the board in the firm, and 0 otherwise, from the BoardEX database
OWNNSDR	Percent of the voting rights (shares) of the firm, owned directly by the domestic corporate insiders, from the ORBIS database
OWNINSTL	Percent of the voting rights (shares) of the firm, owned directly by the domestic institutional investors, from the ORBIS database
OWNFORG	Percent of the voting rights (shares) of the firm, owned directly by the foreign investors of all types, from the ORBIS database
<i>Firm-level other variables</i>	
FRMAGE	Logarithm of the number of years of the firm between today and its establishment year, from the ORBIS database
FRMSIZE	Logarithm of the value of total assets (USD) of the firm, from its financial statements, from the ORBIS database
FRMSIZEGR	Annual percent change in the value of total assets of the firm, from its financial statements, from the ORBIS database
FRMLEVERG	Ratio of the value of long-term liabilities to the value of total assets of the firm, from its financial statements, from the ORBIS database
ROA	Ratio of the value of net income to the average value of total assets of the firm, from its financial statement and from the ORBIS database
<i>Country-level economic controls</i>	
CREDIT	Logarithm of the amount of domestic credit extended to the private sector (percent of GDP), data from the World Bank's World Development Indicators (https://databank.worldbank.org/source/world-development-indicators). The variable reflects a country's level of financial development
GDPCAP	Logarithm of the level of GDP per capita (current USD), from the World Development Indicators. The variable reflects a country's level of economic development
INFLATION	The rate of annual change of the consumer price index (%), from the World Development Indicators
<i>Country-level institutional controls</i>	
RULAW	Enforcement of the rule of law indicator, ranging from -2.5 to 2.5 (higher values imply better rule of law), from the World bank's Worldwide Governance Indicators (https://databank.worldbank.org/source/worldwide-governance-indicators)
LEGRIGHT	The legal rights indicator, ranging from 0 to 12 (more transparency), with data from the World Bank's Doing Business Report (https://archive.doingbusiness.org/en/doingbusiness)
DIRLIAB	The director liability indicator, ranging from 0 to 10 (more liability), from the World Bank's Doing Business Report

Table A1.
Definitions of variables

(continued)

Name	Description and source
DISCLOS	The business disclosure indicator, ranging from 0 to 10 (more disclosure), from the World Bank's Doing Business Report
<i>Country-level enforcement controls</i>	
REGULATOR	The logarithm of the years between the present year and the year of establishment of the capital market regulator, from Amico (2014)
COMLEXPL	Binary variable that assumes the value of 1, if the corporate governance code applied in the country contains the clause "comply-or-explain," from Amico (2014)
<i>Country-level social controls</i>	
FRACETHN	Index ranging from 0 to 1, from Alesina et al. (2003) . It reflects the likelihood that randomly selected people from a given country will not share the same ethnic origin (ethnic heterogeneity)
FRACLNG	Index ranging from 0 to 1, from Alesina et al. (2003) . It reflects the likelihood that randomly selected people from a given country will not share the same language (linguistic heterogeneity)
FRACRLG	Index ranging from 0 to 1, from Alesina et al. (2003) . It reflects the likelihood that Randomly selected people from a given country will not share the same religion (religious heterogeneity)
<i>Instrument for IV analysis</i>	
CORPETHC	The corporate ethics indicator, ranging from 0 to 7 (highest), from the World Economic Forum's <i>Competitiveness Report</i> (https://www.weforum.org). It measures the extent to which a country's overall population adheres to high ethical standards in business conduct

Table A1.

Supplementary material

The Supplementary Material for this article can be found online.

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