

# Board independence and internal control quality in Egypt: does CEO duality matter?

Board  
independence  
and internal  
quality control

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## Abstract

**Purpose** – This paper aims to examine the relationship between board independence and internal control quality (ICQ) in Egypt and investigate whether CEO duality moderates such an association.

**Design/methodology/approach** – A survey among external auditors is used to assess ICQ among Egyptian listed firms over the period of 2007-2010.

**Findings** – Findings show that board independence does not have a significant positive effect on ICQ. However, when testing for the moderating effect of CEO duality on such a relationship, the authors document that the association becomes positive and significant under combined board leadership structure, whereas it is negative under separated leadership structure.

**Originality/value** – The authors' results demonstrate that CEO duality plays a governance role in weak legal environment like Egypt by strengthening board independence role in increasing ICQ.

**Keywords** Egypt, CEO duality, Board independence, Internal control quality (ICQ)

**Paper type** Research paper

## 1. Introduction

The importance attributed to internal control quality (ICQ) arises from the fact that it represents a cornerstone factor to achieve good financial reporting quality (Krishnan, 2005). Among the several critics addressed to Enron and Worldcom corporations concerning their financial reporting was the charge of a failure to maintain their internal control systems (Verschoor, 2002). Management is responsible for designing and implementing an internal control system within an organisation (Chen *et al.*, 2017). As corporate governance structure plays a crucial role in overseeing management and improving ICQ, different characteristics of the governance structure may interact in shaping ICQ and reducing risk (Knechel and Willekens, 2006). It is, therefore, important to examine monitoring mechanisms related to board characteristics that can increase ICQ.

Several studies have been conducted in US setting to examine the association between board characteristics and internal control weaknesses (Balsam *et al.*, 2014; Chen *et al.*, 2017). They have reported mixed evidence concerning the association between board independence and ICQ. In emerging economies, Hu *et al.* (2014) and Agyei-Mensah (2016) find that board independence is positively associated with internal control disclosures, respectively, in China and Ghana. In Egypt, Khlif and Samaha (2016) have reported insignificant association between board independence and ICQ. This may be counterintuitive in an emergent economy like Egypt characterised by low level of investor



protection and poor accounting and auditing infrastructure (Khelif and Samaha, 2014). Accordingly, we try in this study to deepen the analysis by considering the moderating effect of CEO duality (combined leadership structure versus separated one) on the association between board independence and ICQ in Egypt.

Combs *et al.* (2007) provide evidence that CEO duality affects board independence's impact on corporate performance. Recently, Chen *et al.* (2017) have shown that CEO duality affects the relationship between board independence and the disclosure of internal control weaknesses in the US setting.

This topic is particularly relevant for Egypt, characterised by poor auditing and accounting infrastructure (Elbannan, 2009). Furthermore, new governance reforms enacted in 2005 have insisted on board independence to increase firm's transparency (Afify, 2009; Khelif and Samaha, 2014). However, such new governance reforms remain salient concerning the board leadership structure. Thus, choosing between unitary board leadership structure (CEO serving as the Chairman of the board) or dual leadership (CEO is not appointed as the Chairman of the board) remains an entire voluntary decision in the firm.

Based on a sample of 86 Egyptian non-financial firms over the period of 2007-2010, we document that board independence is not significantly associated with ICQ. When testing for the moderating effect of CEO duality on such a relationship, we document that the association becomes positive and significant under combined leadership structure, whereas it is negative and significant under separated leadership structure.

Our study contributes to the extant accounting literature dealing with the association between board characteristics and ICQ by providing evidence in an emergent civil law market and extends the recent empirical paper of Chen *et al.* (2017) conducted in the US setting. To the best of our knowledge, our paper represents the first attempt to examine the moderating effect of CEO duality on the relationship between board independence and ICQ in an emerging market. The results reported are consistent with those documented by Brickley *et al.* (1997) who find that the costs of separation of CEO and chairman functions are larger than the benefits of unitary board leadership structure for most firms, and that combining the titles of CEO and Chairman can be efficient and consistent with shareholder interests. This result is important for policymakers in Egypt aiming to improve corporate transparency, corporate governance practices and internal control standards.

The rest of this paper is organised as follows. Section 2 develops hypothesis. Section 3 presents the data. Section 4 presents our methodology. Section 5 presents the empirical findings. Finally, section 6 concludes the paper.

## 2. Hypothesis development

One way for a CEO to acquire additional power is achievable through the dual roles of CEO and board chair (Daily and Johnson, 1997). With respect to CEO duality, there are two divergent views (Combs *et al.*, 2007). Although agency theory suggests that power is something that needs to be restricted and controlled, the strategic leadership literature views power as an essential tool to increase organisational effectiveness (Cannella and Monroe, 1997).

On the one hand, Fama and Jensen's (1983) agency framework indicates that a unified leadership structure reduces the importance of the separation between decision control (chair of the board) and decision management (CEO). A combined leadership structure may facilitate CEO entrenchment (Pfeffer, 1981), and it is considered as the primary cause of the misalignment of interests (Kim *et al.*, 2008). Accordingly, CEO duality may constrain the desired system of checks and balances and compromise the board independence in overseeing top management behaviour (Cerbioni and Parbonetti, 2007). Powerful CEO has a

superior knowledge of the private information dealing with the firm's competitive advantages and its internal conditions. Therefore, duality may limit the complete transfer of private information between the CEO and board members (Kim *et al.*, 2008). For instance, Jensen (1993, p. 36) states:

The function of the chairman is to run board meetings and oversee the process of hiring, firing, evaluating, and compensating the CEO. Clearly the CEO cannot perform this function apart from his or her personal interest. Without the direction of an independent leader, it is much more difficult for the board to perform its critical function. Therefore, for the board to be effective, it is important to separate the CEO and Chairman positions.

On the other hand, Anderson and Anthony (1986) point out that duality enables a clear-cut leadership in the formulation and the implementation of firm's strategy, and this leads to greater efficiency. They argue that a unified leadership structure reduces information sharing costs and conflict of interests between CEO and non-CEO chairman. CEO duality allows more power which leads to faster strategic response times and offers a focal point for external accountability (Finkelstein and D'Aveni, 1994) and a clear line of authority within the firm and minimizes the potential for executive conflicts (Finkelstein and D'Aveni, 1994).

Independent or outside directors are generally characterised by lack of knowledge of a firm's operations that is needed to distinguish between performance outcomes and management's control (Baysinger and Hoskisson, 1990). Outside director-dominated boards tend to focus on short-term aspects (e.g. accounting and stock market data) rather than long-term organisational effectiveness based on the improvement of internal control system (Baysinger and Hoskisson, 1990). Accordingly, CEO duality will reinforce the position of CEO during board meetings who will orient outside directors towards organisational effectiveness through the improvement of ICQ. If duality is conferred under an outside director-dominated board, the benefits of duality should outweigh its risks (Finkelstein and D'Aveni, 1994). In this regard, Chen *et al.* (2017, p. 50) suggest that "if a unitary structure increases operating efficiency and effectiveness, management may encourage a strong internal control system in order to better manage internal operations and decision making".

Empirical evidence concerning the moderating effect of CEO duality on board independence-accounting phenomena relationship is quite limited in accounting and management literature. For instance, Combs *et al.* (2007) examine the moderating effect of CEO duality on the association between board independence and firm performance as measured by the magnitude of abnormal returns. They document that the proportion of outside directors does not have a significant effect on abnormal returns and that the interaction variable between outside directors and CEO duality is negatively associated with abnormal returns. With respect to moderating effect of CEO duality on board independence – ICQ relationship, Chen *et al.* (2017) have examined such a relationship in the US setting. They document a negative relation between board independence and the disclosure of internal control weaknesses, and such a negative association is stronger for firms characterised by CEO duality (combined positions of CEO and Chairman) than for those characterised by dual leadership.

In a sub-Saharan setting, namely, Kenya, Tuwey and Tarus (2016) test for the effect of CEO duality on board strategy involvement in terms of initiating strategy proposals, making decisions on long-term strategies, implementing strategic decisions and controlling and evaluating strategic decisions. Based on sample of 186 CEOs of private firms, they document that CEO duality has a positive and significant effect on board strategy involvement. In South Africa, Ntim *et al.* (2017) investigate the question of whether CEO duality moderates the association between firm's performance and executive compensation. Based on a sample of 1,521 firm-year observations over the period of 2002-2012, they

document that the positive and significant association between firm's performance and executive compensation becomes insignificant under CEO duality. To sum up, these two studies conducted in African settings suggest that CEO duality may lead to a strategy of firm's assets protection through the focus on long-term strategies and strategic decisions and the non-systematic increase of executives' compensation either in case of performance improvement.

Thus, we test the following hypothesis:

- H1.* CEO duality moderates the board independence–ICQ relationship. Specifically, under CEO duality, the relationship between the proportion of outsiders on the board and ICQ is positive and significant.

### 3. Data

Our sample consists of listed companies on the Egyptian Stock Exchange over the period of 2007-2010. The choice of this period is motivated by two main reasons. On the one hand, we begin with 2007 to avoid any kind of bias related to the first year of application of the Egyptian Corporate Governance Code enacted in late 2005 with an effective application from 2006 (Khelif and Samaha, 2014). On the other hand, we restrict our data collection to 2010 given the fact that Egypt has witnessed financial and political instability since the beginning of 2011. We also exclude financial institutions and insurance companies, as they have specific accounting rules, and they are classified as highly regulated sectors. For the remaining listed companies, the criteria for the inclusion are as follows:

- annual reports must be available at the stock exchange; and
- company must have been listed for the entire period of survey 2007-2010.

The sample selection process yields a total number of 344 firm-year observations over the period of 2007-2010. Table I displays more information about listed companies included in our sample. Table II provides information about the sources of data collection for all variables.

### 4. Methodology

#### 4.1 The model

To test the empirical validity of the hypothesis formulated above, we estimate a panel data model with balanced data. Panel data analysis is a sequence of pictures of the same observations but at different points in time. In a fixed-effects regression, indicator variables (1/0) are introduced for all years less one ( $T - 1$ ). The following regression analysis is performed:

Industry	No. of companies listed in the Egyptian Stock Exchange 100	No. in the sample	(%) of inclusion
Commercial and services	48	44	92
Industrial	44	42	95
Total	92	86	93

**Table I.**  
Sample description

Variables	Required data	Sources of information
<i>Dependent variable</i>		
ICQ	Internal control quality and varies from 0 to 2	A survey is conducted among Egyptian auditors to evaluate firm's internal control quality (see Appendix)
<i>Independent variables</i>		
<i>Test variable</i>		
BInd	The percentage of independent directors on the board	Board of Directors data: EGID <sup>a</sup>
<i>Moderating variable</i>		
CEOD	1 if CEO is also the Chairman of the board and 0 otherwise	Board of Directors data: EGID <sup>a</sup>
<i>Control variables</i>		
AudS	1 if Big 4 and 0 otherwise	Auditor report : Firm's web site and EGID <sup>a</sup>
BSize	Number of board of director members	Board of Directors data: EGID <sup>a</sup>
FF	Percentage of shares held by individual (retail) investors	Ownership Structure data: EGID <sup>a</sup>
Loss	1 if the firm reports negative earnings and 0 otherwise	Income statement: Annual report : Firm's website and EGID <sup>a</sup>
FSize	Natural logarithm of market capitalisation	EGID <sup>a</sup>
Lev	Total debt divided by total assets	Balance sheet: Annual report : Firm's website and EGID <sup>a</sup>
ROA	Net income to total assets	Annual report: Firm's website and EGID <sup>a</sup>

**Table II.**  
Data sources

**Note:** <sup>a</sup>Egyptian Company for information dissemination and data are obtained for a fee

$$\begin{aligned}
 ICQ_{it} = & \alpha_0 + \alpha_1 BInd_{it} + \alpha_2 CEOD_{it} + \alpha_3 AudS_{it} + \alpha_4 BSize_{it} + \alpha_5 FF_{it} + \alpha_6 Loss_{it} \\
 & + \alpha_7 FSize_{it} + \alpha_8 Lev_{it} + \alpha_9 ROA_{it} + \sum_{t=1}^3 \alpha_{t+9} YEAR\_Dummy_t + \varepsilon_{it}
 \end{aligned}
 \tag{1}$$

where:

*Dependent variable*

ICQ = internal control quality.

*Test variable*

BInd = board independence proxied by the percentage of independent directors on the board;

*Moderating variable*

CEOD = CEO duality proxied by a dummy variable: 1 if CEO and Chairman is the same person, 0 otherwise.

*Control variables*

AudS = external auditor's size (dummy variable; 1 for Big four firms and 0 otherwise);

BSize = board size proxied by the number of board of director members;

FF = free float proxied by the percentage of shares held by individual (retail) investors:

*Loss* = a dummy variable: 1 if a firm reports negative earnings, 0 otherwise;  
*FSize* = natural logarithm of firm's market capitalisation;  
*Lev* = leverage ratio measured as the total debt divided by total assets; and  
*ROA* = profitability ratio measured as the net income divided by total assets.

Initially, we estimate Model 1 to examine the effect of board independence and CEO duality on ICQ. To test for our hypothesis, we distinguish between companies characterised by unitary leadership (combined positions of CEO and Chairman or CEO duality) and those having dual leadership structure. Then, we re-estimate Model 1 after removing CEO duality variable to examine whether such a variable moderates the association between board independence and ICQ under the two leadership structures. A sensitivity analysis for this moderating hypothesis consists of inserting an interaction variable (*Blnd \* CEOD*) which equals to the percentage of outside directors on the board if the firm has combined positions of CEO and Chairman and 0 otherwise.

#### 4.2 Internal control quality

Information about ICQ cannot be directly detected, and it is not generally available (Krishnan, 2005). Following the regulation of internal control disclosure in US setting through the Sarbanes–Oxley (SOX) Act (Sections 302 and 404) in the USA, information about ICQ becomes available. For instance, SOX 302 enacted in 2002 requires that management has to disclose the material internal control weaknesses in the Form 10-K, whereas SOX 404, enacted in 2004, requires that auditor should certify such an information about internal control weaknesses. Such a regulation does not exist in an emerging economy like Egypt characterised by low accounting and auditing infrastructure (Khlif and Samaha, 2014).

Following Khlif and Samaha (2014, 2016), we use survey methodology among 20 Egyptian auditors, who were appointed as legal auditors for Egyptian listed companies included in our sample over the period of 2007-2010, to get information about ICQ. The survey approach is based on the internal control checklist developed by Hwang *et al.* (2004)[1]. This checklist includes 23 items dealing with organisation, roles and responsibilities; risk management; overall monitoring; IT function and organisation; system characteristics; and IT monitoring control.

To conduct the survey, we analyse the audit report, which mentions the name of auditor conducting the legal audit, his/her address and telephone. Based on this information, we arrange a meeting with legal auditors to score the firm ICQ with respect to the checklist mentioned above. These meetings were held from June to August 2012, and each auditor was asked to assign (0) if not effective, (1) moderately effective and (2) highly effective. All auditors surveyed clearly state that the assessment of firms' internal control systems was based on the archived audit files for the years specified[2]. ICQ score for each firm is calculated as follows:

$$ICQ_i = \frac{\sum_{j=1}^{23} Score_{ji}}{23} \quad (2)$$

Accordingly, ICQ score ranges from 0 to 2. Detailed information about the 23 internal control items is displayed in Appendix. Controlling for the internal validity of ICQ variable, Cronbach's alpha for each year varies from 0.745 in 2009 to 0.871 in 2007 confirming the internal validity of our ICQ variable (Table III).

### 4.3 Control variables

We include seven control variables dealing with corporate governance (board size, ownership structure) and corporate characteristics (corporate size, financial performance, leverage ratio) and auditor type (Big-4 versus non-Big-4 auditors).

With respect to corporate governance variables, board size is regarded as a relevant governance mechanism that can enhance corporate transparency. The concept of expert power suggests that large board size allows diverse experiences and opinions which potentially increase a board's supervisory capacity (Samaha *et al.*, 2015). Accordingly, we expect a positive association between board size and ICQ. In addition, ownership dispersion, as proxied by free float, may affect ICQ, as it increases information asymmetry between small and large owners. Accordingly, management will try to mitigate information asymmetry problems by improving corporate transparency through increased ICQ.

With respect to corporate characteristics, it is generally expected that companies with large corporate size have better ICQ (Krishnan, 2005). However, corporate size is generally associated with greater complexity implying more internal control problems, and thus lowers ICQ (Zhang *et al.*, 2007). Following Doyle *et al.* (2007) corporate size is measured by the natural logarithm of market capitalisation. Given the mixed theoretical predictions and the inconclusive empirical evidence (Kinney and McDaniel, 1989), we do not expect a sign for ( $F_{Size}$ ) variable. In addition, Elbannan (2009) suggests that ICQ may be influenced by financing decisions. He documents that lower ICQ is associated with lower credit ratings implying less easy access to debt financing. Accordingly, we expect that companies with high leverage ratio will have stronger internal control systems, especially in emergent markets where banks represent a primary source of external finance (Barako *et al.*, 2006). Moreover, firm experiencing financial problems may reduce its investment in the maintenance of a proper internal control system (Krishnan, 2005). Financial distress is measured by a dummy variable (*Loss*) that takes the value of 1 if a firm reports a negative earning and 0 otherwise.

Finally, Khlif and Samaha (2016) have shown that auditor's size is positively associated with ICQ in the Egyptian setting. Accordingly, we expect that auditor's size, as proxied by a dummy variable (1 if Big-4 and 0 otherwise) is positively related to ICQ.

## 5. Results

### 5.1 Descriptive statistics

Table IV A shows descriptive statistics for continuous variables. ICQ variable has an average of 1.139 and varies from 0.013 to 2. Board independence has a mean of 10.697 per cent and ranges from 0 to 95 per cent and the proportion of CEO duality amounts to 60.465 per cent.

With respect to control variables, board size ranges from a minimum of 3 to a maximum of 31 with an average of 11 board members. Ownership dispersion, as proxied by free float, has an average of 40 per cent and ranges from 1 to 99 per cent. Leverage ratio, measured as the total debts divided by total assets, has a mean of 15.400 per cent and ranges from 0 to 200.220 per cent[3]. Finally, corporate size has a mean of 20.242 and varies from 15.923 to

Years	2007	2008	2009	2010
Cronbach's alpha	0.871	0.831	0.745	0.771

Note: ICQ: internal control quality

**Table III.**  
Internal validity  
of ICQ

Variable	Mean	SD	Minimum	Maximum
<i>A. Continuous variables</i>				
ICQ	1.139	0.446	0.013	2
BInd (%)	10.697	16.300	0	95.000
BSize (number)	10.465	5.353	3	31
FF (%)	40.058	24.847	1.000	99.000
Lev (%)	15.400	31.600	0	222.000
FSize	20.242	1.809	15.923	24.897
ROA	8.648	9.370	-11.000	55.000
<i>B. Proportions for dummy variables</i>				
Variable	Definition		(%)	
AudS	1 if Big four and 0 otherwise		40.690	
CEOD	1 if CEO is also the Chairman of the board and 0 otherwise		60.460	
Loss	1 if a firm reports negative earnings, 0 otherwise		4.900	

**Notes:** ICQ: internal control quality; BInd board independent defined as the number of independent directors on the board; BSize: board size; FF: free float; Lev: leverage ratio; FSize: corporate size proxied by the natural logarithm of market capitalisation; ROA: return on assets; AudS: external auditor's size (dummy variable; 1 for big four firms and 0 otherwise); CEOD: CEO duality proxied by a dummy variable: 1 if CEO is also the Chairman of the board and 0 otherwise; Loss: a dummy variable: 1 if a firm reports negative earnings, 0 otherwise; *Italic style is used to highlight the variables of interest in the models*

**Table IV.**  
Descriptive statistics

24.897. Concerning the dummy variables, 40.690 per cent of firms in our sample are audited by Big 4 audit firms, and 4.900 per cent of firms have reported negative earnings.

### 5.2 Univariate analysis

Table V presents the association between dependent and independent variables. Board independence is not significantly associated with ICQ. Similarly, CEO duality is not significantly related to ICQ. With for the remaining corporate governance control variables, only ownership dispersion is positively associated with ICQ.

With respect to corporate characteristics, corporate size is negatively associated with ICQ, whereas leverage ratio is not significantly associated with ICQ in the Egyptian setting. Loss variable is not also associated with ICQ. Finally, highly profitable firms are associated with lower ICQ. This unexpected result may be justified by the fact that high profitable ratio may indicate a solid financial position implying less interest on internal control system and thus lower ICQ.

For external auditor's size, test of equality of means for ICQ shows that the mean of ICQ is 0.963 for non-Big 4 audit firms, whereas it accounts for 1.395 for Big 4 audit firms. The difference between these two types of audit firms is  $-0.432$ , and it is highly significant [ $t = -9.990$  (0.000)]. Therefore, external auditor's size is significantly associated with ICQ.

### 5.3 Multivariate analysis[4]

Results of multivariate analysis are reported in Table VI. In Model 1, our results suggest that neither board independence nor CEO duality has a significant effect on ICQ. As stated in the methodology part, we test for the moderating effect of CEO duality on the association between board independence and ICQ by sub-grouping our overall sample into two sub-samples: unitary leadership structure (CEO duality = 1) and separated leadership structure (CEO duality = 0). For unitary leadership structure group, the association between board independence and ICQ becomes positive and significant ( $t = 3.680$ ;  $p = 0.000$ ). This finding is



Variables	ICQ	BInd	BSize	FF	Lev	FSize	ROA
ICQ	1.000						
BInd	-0.082	1.000					
BSize	-0.048	0.153**	1.000				
FF	0.187**	-0.108*	-0.153**	1.000			
Lev	-0.031	0.052	0.092*	-0.135**	1.000		
FSize	-0.164**	0.536***	0.563***	-0.406***	-0.046	1.000	
ROA	-0.131*	0.041	0.312***	-0.087*	0.257***	0.088	1.000
<i>t-test: test of equality of means</i>							
Category	Number of observations			Mean	SD	T-statistic (p-value)	
<i>AudS</i>							
0	204			0.963	0.418	-9.990***	
1	140			1.395	0.353	(0.000)	
<i>CEOD</i>							
0	136			1.148	0.448	0.309	
1	208			1.133	0.446	(0.757)	
<i>Loss</i>							
0	327			1.138	0.453	-0.078	
1	17			1.147	0.294	(0.937)	

**Notes:** ICQ: internal control quality; BInd: board independent defined as the number of independent directors on the board; BSize: board size; FF: free float; Lev: leverage ratio; FSize: corporate size proxied by the natural logarithm of market capitalisation; ROA: return on assets; AudS: external auditor's size (dummy variable; 1 for big four firms and 0 otherwise); CEOD: CEO duality proxied by a dummy variable: 1 if CEO is also the Chairman of the board and 0 otherwise; Loss: a dummy variable: 1 if a firm reports negative earnings, 0 otherwise. \*Significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

**Table V.**  
Univariate analysis

in line with those reported by [Chen et al. \(2017\)](#) in the US setting. For separated leadership structure group, the relationship between board independence and ICQ becomes negative and significant ( $t = -3.030$ ;  $p = 0.003$ ). These findings confirm that CEO duality moderates the relationship between board independence and ICQ, as the initial non-significant association becomes positive and significant under CEO duality and negative and significant under separated leadership structure.

Accordingly, CEO duality contributes to the improvement of control role played by board of directors and more specifically by outside directors in the Egyptian setting. As outside directors are generally characterised by the lack of knowledge of a firm's operations, they tend to focus on short-term aspects (e.g. accounting and stock market data) rather than long-term organisational effectiveness based on the improvement of internal control system ([Baysinger and Hoskisson, 1990](#)). Therefore, unitary leadership will encourage them to put pressure on management to strengthen internal control system to better manage internal operations and decision-making. In contrast, separated leadership structure increases information sharing costs and conflict of interests between CEO and non-CEO chairman which will increase the focus of outside directors on short-term aspects rather than improving internal control system which translates into lower ICQ.

To confirm this moderating effect of CEO duality on the relationship between board independence and ICQ, we introduce an interaction variable ( $CEOD*BInd$ ) in Model 4. This variable captures the effect of board independence on ICQ only when the firm is characterised by a combined leadership structure. It takes the value of the ratio of outside

Variables	Model 1	Model 1 CEO duality	Model 3 Separated leadership structure	Model 4 Interaction variable
Constant	1.862 (7.070)***	1.287 (3.830)***	0.813 (1.980)**	1.764 (7.010)***
<i>Test variables</i>				
BIInd	0.124 (1.130)	<i>0.581 (3.680)***</i>	<i>-0.435 (-3.030)***</i>	
CEOD	0.024 (0.640)			
BIInd*CEOD				<i>0.544 (3.910)***</i>
<i>Control variables</i>				
AudS	0.416 (11.900)***	0.442 (9.120)***	0.488 (10.400)***	0.441 (12.740)***
BSize	0.009 (2.330)**	0.005 (1.060)	0.000 (0.010)	0.008 (2.050)**
FF	0.138 (1.780)*	0.044 (0.450)	0.449 (3.680)***	0.160 (2.140)**
Loss	-0.072 (-0.870)	0.097 (0.079)	-0.044 (-0.410)	-0.057 (-0.710)
Lev	0.041 (0.740)	0.116 (1.860)*	-0.293 (-2.550)**	0.038 (0.710)
FSize	-0.030 (-2.370)**	-0.027 (-1.650)	0.019 (0.960)	-0.025 (-2.060)**
ROA	-0.840 (-4.050)***	-0.980 (-4.180)***	0.276 (0.620)	-0.875 (-4.340)***
2008	-0.551 (-11.690)***	-0.370 (-0.610)	-0.545 (8.550)***	-0.553 (-11.990)***
2009	-0.596 (-12.680)***	0.159 (2.620)**	-0.597 (-9.370)***	-0.598 (-12.990)***
2010	-0.399 (-8.490)***	0.558 (9.130)***	-0.396 (-6.230)***	-0.400 (8.700)***
Number of observations	344	208	136	344
Adjusted R <sup>2</sup> (%)	52.460	54.130	65.950	55.950
F (p-value)	32.540 (0.000)***	21.030 (0.000)***	24.770 (0.000)***	38.330 (0.000)***
Max VIF	1.970	1.710	3.090	1.920

**Notes:** ICQ: internal control quality; Bind: board independent defined as the number of independent directors on the board; BSize: board size; FF: free float; Lev: leverage ratio; FSize: corporate size proxied by the natural logarithm of market capitalisation; ROA: return on assets; VIF: variance inflation factor; AudS: external auditor's size (dummy variable; 1 for big four firms and 0 otherwise); CEOD: CEO duality proxied by a dummy variable: 1 if CEO is also the Chairman of the board and 0 otherwise; Loss: a dummy variable: 1 if a firm reports negative earnings, 0 otherwise. \*Significant at 10 per cent; \*\*significant at 5 per cent; \*\*\*significant at 1 per cent; Italic style is used to highlight the variables of interest in the models

**Table VI.**  
Multiple regression  
analysis

directors on the board under CEO duality and 0 otherwise. Findings show that this interaction variable (*CEOD\*BIInd*) variable has a significant positive effect on ICQ ( $t = 3.910$ ;  $p = 0.000$ ) which provides further support for the moderating role of CEO duality on the relationship between the proportion of outsiders on the board and ICQ.

With respect to control variables, only auditor type has a significant positive effect on ICQ across all models, and these findings are in line with those reported by [Khelif and Samaha \(2016\)](#). Ownership dispersion has also a positive effect ICQ in Model 1, and such a relationship becomes more prevailing under separated leadership structure, whereas it becomes insignificant under CEO duality. Such a result may be justified by the fact that CEO duality may strengthen the position of block holders at the expense small shareholders leading to lower ICQ. The relationship between board size and ICQ was significant in model 1 ( $t = 2.330$ ;  $p = 0.021$ ), and it becomes insignificant for combined and separated leadership structures. Concerning leverage ratio, the association is insignificant in Model 1, and it becomes positive and significant under CEO duality, whereas it is negative and significant for separated leadership structure. This implies that a unitary leadership structure strengthens the control role played by creditors when there is a high leverage ratio by

improving ICQ. Finally, for corporate size the association is only negative and significant for the overall model, and it becomes insignificant for combined and separated leadership structures.

It should be noted that the adjusted R-Squares ranges from 54.120 per cent to 65.950 per cent indicating good explanatory powers for all models examined.

## 6. Summary

It is generally accepted that that the fiduciary responsibility and monitoring role of independent directors should improve better internal control practices by management. Recent accounting literature (Chen *et al.*, 2017) suggests that the relationship between board independence and ICQ depends on the board leadership structure; specifically whether the company has a combined leadership structure (unitary CEO/Chairman) or separated leadership structure (dual CEO/Chairman).

As Khlif and Samaha (2016) have documented a non-significant effect of board independence on ICQ in Egypt, we try to refine the analysis by exploring the moderating effect of board leadership structure on such a relationship. Using a sample of 86 Egyptian non-financial firms over the period of 2007-2010, we document that board independence is positively and significantly associated with ICQ under unitary board leadership structure CEO/Chairman, and it is negative and significant under dual leadership structure.

Our study complements previous empirical literature dealing with ICQ in Egypt (Khlif and Samaha, 2016), as it refines the analysis with respect to a controversial issue concerning the non-significant effect of board independence on ICQ in Egypt. It also extends African studies dealing with the moderating effect of CEO attributes on corporate performance board of directors' compensation (Ntim *et al.*, 2017, in South Africa) and the impact of CEO duality on board strategy involvement (Tuwey and Tarus, 2016, in Kenyan setting). Our findings also suggest that the effect of board independence is conditional on the structure of firm leadership (dual versus unitary) and that the effectiveness of internal control should be assessed in the context of the overall corporate governance environment.

These findings may have policy implications for Egyptian standard-setters concerning the enactment of a regulation like SOX that imposes the disclosure of internal control weaknesses in the annual reports in Egypt and other emerging economies. It also highlights that contrary to the common view the CEO duality has an adverse effect on corporate transparency (Samaha *et al.*, 2015, for voluntary disclosure), CEO power through unitary board leadership structure may have a beneficial effect on the monitoring role of independent directors through increased ICQ in an emerging economy like Egypt.

Future research should examine other CEO characteristics on ICQ and test their moderating effect on the association between board independence and ICQ in emerging and developed settings. These characteristics may include CEO turnover, age, founding status, compensation, ownership, tenure and reputation.

## Notes

1. We follow the same strategy adopted by Khlif and Samaha (2014) who adopt this approach to get information regarding ICQ for Egyptian listed companies.
2. An illustrative example of how auditors have responded to our survey is as follows: "We have the pleasure to provide you with our assessment to the internal control system of Company 'X' listed on EGX for the years 2007 – 2010. We would like to indicate that our assessment provided in this document was obtained from our archived audit files for the years required, however, we will not be able to provide the basis of our assessment for confidentiality reasons. According to

the scaling theme that you sent us, we provide you in the following tables our assessment for each item in the questionnaire on a scale from 0 (less effective) to 2 (highly effective)".

3. For one firm included in our sample, retained and current losses are largely superior to capital stock implying a total negative shareholder equity. For this firm, total long-term debts account for 96,721,380, and total assets amount to 48,006,129.
4. All models examined do not suffer from multicollinearity problem, as all maximum variance inflation factor (VIFs) do not exceed 3.100.

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### Further reading

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## Appendix

Internal control checklist (Hwang <i>et al.</i> , 2004)	Not effective	Moderately	Highly
<b>1. Control Environment Factors</b>			
(1) Organisation, Roles and Responsibilities <ul style="list-style-type: none"> <li>• Role of the Board of Directors</li> <li>• Effectiveness of the Organisation and Key Management</li> <li>• Human Resource Policies and Procedures</li> </ul>			
(2) Risk Management <ul style="list-style-type: none"> <li>• Management's Risk Assessment Process</li> <li>• Awareness of Compliance with Laws and Regulations</li> </ul>			
(3) Overall Monitoring <ul style="list-style-type: none"> <li>• Reasonableness of Management's Plans and Budgetary Controls</li> <li>• Reliability of Financial Reporting and Management's Estimates</li> <li>• Role of the Audit Committee and Internal Audit</li> </ul>			
<b>2. Systems and IT Environment and Monitoring Factors</b>			
(4) IT Function and Organisation <ul style="list-style-type: none"> <li>• IT Strategy</li> <li>• Management and User Satisfaction</li> <li>• IT Organisation</li> <li>• IT People</li> </ul>			
(5) System Characteristics <ul style="list-style-type: none"> <li>• Technical Architecture</li> <li>• Usage of Emerging Technologies</li> <li>• Key Application Background (General Accounting)</li> <li>• Significant Changes to System and IT Environment</li> <li>• Known Problems with Systems</li> </ul>			
(6) IT Monitoring Control <ul style="list-style-type: none"> <li>• IT Performance Measures</li> <li>• System Development and Implementation</li> <li>• Application Maintenance</li> <li>• IT Security</li> <li>• Computer Operation</li> <li>• Business Continuity and Disaster Recovery Plan</li> </ul>			
<b>Internal control scoring (Hitzig &amp; Jacoby, 1995)</b>			
<b>Control effectiveness</b>	<b>Control conditions</b>	<b>Assessed</b>	<b>Score</b>
Highly effective	Controls exist. No deviations disclosed in tests of controls.	Low	2
Moderately effective	Controls exist. Deviations detected, but unlikely to exceed tolerable rate	Below maximum	1
Not effective	(a) Key controls absent  (b) Controls exist. Deviations detected, but with a high risk of exceeding tolerable rate.	Maximum	0

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