

GRAPHICAL REPORTING PRACTICES IN THE ANNUAL REPORTS OF JORDANIAN BANKS: AN EMPIRICAL ANALYSIS

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Abstract

This study aims at investigating graphical reporting practices in the annual reports of Jordanian banks. Data are collected from the annual reports of 15 banks listed on Amman Stock Exchange for the period 2008-2013. The study revealed that graphs are being moderately used by Jordanian banks to present information in their annual reports. The presence of non-executive directors on the boards of Jordanian banks tend to limit graph usage in their annual reports. In addition, the study provides clear evidence for the presence of improperly designed graphs in the annual reports of Jordanian Banks. Thus, regulators in Jordan such as the Security Exchange Commission may need to develop a set of guiding principle for properly designed graphs. Furthermore, effort has to be devoted to encourage firms to comply with these principles.

Keywords: Financial Reporting, Graphical Reporting, Impression Management, Jordan

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1 Introduction

Corporate annual reports are considered the main source of information about the firm's performance. These reports disclose statutory and voluntary information. Statutory financial statements have been criticized for losing their relevance for decision making over time. Specifically, concerns have been raised about their sufficiency for representing the complexity of the firm's operations, and their adequacy for satisfying the users' needs. In addition, more users are facing difficulties in reading and understanding many parts of these statements (Core *et al.*, 2003; Dantoh *et al.*, 2004)

On the other hand, voluntary disclosure represents the free choice of management to provide information beyond what is statutory required (Meek *et al.*, 1995). Two competing frameworks have been used to explain voluntary disclosure. These are: incremental information and impression management. The assumptions of both frameworks are well rooted in the agency theory (Baiman, 1990). The agency theory argues that the separation of ownership and control creates information asymmetry problem, where management (insiders) are better informed than owners (outsiders) about the firm's current performance and future prospects. This information superiority may induce management to make decisions that maximize their own interest rather than the owners' interests. This conflict of interests gives rise to agency costs which are borne by the owners (monitoring and controlling cost) and by the

management (bonding costs) (Jensen and Meckling, 1976).

The incremental information hypothesis assumes that management provides additional information to overcome the information asymmetry problem (Baginski *et al.*, 2004). Empirical evidence shows how voluntarily disclosed information helps in mitigating the influence of agency problems on the investment and financing decisions and thereby the firm value (e.g. Heflin *et al.*, 2002; Ball, 2006; Hope and Thomas, 2007). On the other hand, the impression management hypothesis argues that voluntary information is self-interest driven. Furthermore, it represents an opportunistic behavior through which management involve in biased reporting to influence the perceptions of outsiders (Bowen *et al.*, 2005; Brennan *et al.*, 2009). Accordingly, management may manipulate the accounting numbers and the way they are represented to conceal the negative performance of the firm (Barton and Mercer, 2005). Empirical evidence supports this argument and reports cases where management makes discretionary reporting choices in the measurement, disclosure and presentation of the voluntarily disclosed information (Beattie and Jones, 2008).

One of the voluntary disclosure areas that have become a common practice in the annual reports of many firms is the graphical presentation of financial and non-financial information (Ball, 2011). Empirical evidence provided by Beattie and Johns (1997) shows that 92% of leading U.S. listed firms and 80% of leading U.K. listed firms include graphs in their annual reports. Similar high usage rates are found in

Canada (Chevalier and Roy, 1993), Australia (Mather *et al.*, 1997), and France (Jounini, 2013).

Graphs are, basically, used as a tool for analyzing and presenting information. The advantages of graphs over other forms of presenting financial and non-financial information are well documented in the literature. For example, the use of graphs in the annual reports enhances the accuracy and effectiveness of the communication process. Thus, they are, increasingly, being used as decision aids. Furthermore, graphical presentation provides better understanding and more confidence in decision making (Amer and Ravindran, 2010). This explains the tendency of many users to look, only, to graphs instead of reading the whole annual report (Zweig, 2000). In addition, it may explain the preference of the majority of shareholders surveyed in the UK to see more graphs included in the annual reports (David, 2001). However, if not properly constructed, graphs can potentially distort the user's perception about the presented information (Mather *et al.*, 2005). Given the voluntary nature of graphical disclosure, the use of graphs in the annual reports provides a great opportunity for management to mislead readers and create a favorable impression about the firm's performance (Murphy and Zimmerman, 1993). This is because graphs fall outside the framework of accounting regulation (Melis *et al.*, 2013). The existing accounting standards do not cover the issues of graph design, presentation, and auditing in the annual reports (Burgess *et al.*, 2008). Accordingly, auditors are not required to report that graphs are properly stated in the annual report (Penrose, 2008). However, Statement on Auditing Standards Number 8 requires auditors to make sure that other information in the annual report is not materially inconsistent with the financial statements (AICPA, 1975). This auditing exemption may encourage management to use graphs as a mean to influence the stakeholders' perceptions. The evidence reported by Mather *et al.* (2005) shows that graphs are used by management, as a deception tool, to mislead users through: selectivity in using graphs, inappropriate construction techniques, and misrepresentation of data. Similar results are reported by Beattie and Jones (2002), Pennington and Tuttle (2009), Saorin *et al.* (2009), and Cho *et al.* (2012). If this is the case in the developed countries, what should be expected regarding graphical reporting in a developing country like Jordan?

Research into graphical reporting practices in Jordan is lacking. Thus, it would be difficult to know the extent and nature of graphical reporting in the annual reports of Jordanian firms. In addition, it would be difficult to know whether, or not graphical reporting is used to provide incremental information to stakeholders, or to possibly manage their perceptions. Therefore, the purpose of the current study is to, empirically; investigate graphical reporting practices in the annual reports of Jordanian firms. More precisely the study seeks to:

1) Describe the current graphical reporting practices in the annual reports of Jordanian firms.

2) Investigate the presence of distortion in the graphical reporting in the annual reports of Jordanian firms.

3) Identify the factors that influence the level of graphical reporting in the annual reports of Jordanian firms.

Despite the growing utilization of graphs in the annual reports, it remains inadequately researched (Beattie and Jones, 2008). In addition, graphical disclosure has only been documented in the context of developed countries. Studies from developing countries are lacking. By providing empirical evidence on graphical disclosure practices in a developing country like Jordan, the current study helps in bridging these gaps in the literature. Furthermore, such evidence, provide rich insights on management's voluntary disclosure preferences. Hence, it adds to the extant knowledge and understanding of voluntary disclosure. On the other hand, by documenting evidence on graph manipulation in terms of graph construction, the current study adds to the impression management literature. In addition, it contributes to the corporate reporting literature and, specifically, the quality and effectiveness of reporting. Finally, the findings of the current study could be of great interest to regulators and professional organizations in Jordan who are concerned with the quality of financial reporting and investor protection. For example, they may consider the development of guiding principles for good practices of graph design.

The remainder of the study is organized as follows: Section 2 provides a brief overview of related literature. Hypotheses development is discussed in Section 3. Section 4 presents the research methodology. Section 5 reports and discusses the results of the empirical model and testing the study's hypotheses. In Section 6 the summary and conclusion are presented.

2 Literature review

Prior studies on graphical disclosure indicate that graphs are used extensively by firms in developed countries. For example, in the US, Steinbart (1989) found that 79% of the Fortune 500 firms use graphs in their annual reports with an average of 8 graphs per report. Beattie and Jones (1997) reported that 92% of the 100 leading US firms use graphs with an average of 13 graphs per report. Burgess, (2003) reported a rate of 91.4%. Likewise, high levels of graphical disclosure (exceeding 80%) are found in the UK (Beattie and Jones, 2001), France (Jouini, 2013), Germany (Melis *et al.*, 2013), Canada (Chevalier and Roy, 1993); Netherlands (Beattie and Jones, 2001), and Italy and Spain (Melis *et al.*, 2013). This extensive use of graphs may be attributed to the various advantages they have over other forms of presenting information. For example, graphs are more

user-friendly than tables. They are easily understood and remembered, and they help in overcoming language barriers (Courtis, 1997). In addition, Graphs are effective in summarizing information. They reduce the effect of information overload, facilitate visual comparisons, and identify trends (Chan, 2001). Graphs can be processed by the brain much faster than other forms of presenting information. Thus, they save the reader's time in analyzing information and making decision (Speier, 2006). Furthermore, prior studies show that the most frequently graphed financial variables are sales, earnings (before tax, after tax, or per share), shareholders' equity, assets, and dividends. The most commonly used graph types are column, line and pie. Another significant finding of prior studies is the inclusion of improperly designed graphs in the annual reports. Such graphs can potentially distort the user's perception about the underlying information (Tuft, 2001). Furthermore, they provide a great opportunity for management to mislead readers and create a favorable impression about the firm's performance (Murphy and Zimmerman, 1993).

Impression management refers to the actions purposely designed and carried out to influence the perception of others (Bolino *et al.*, 2008). In the

context voluntary disclosure, graphical reporting is considered one of the most important impression management techniques that can be used by management to influence the reader's perception about corporate performance (Frownfelter-Lohrke and Fulkerson, 2001). Accordingly, the information conveyed through graph is biased and thus unreliable (Goundar, 2009). According to Beattie and Jones, (2008) impression management using financial graphs may occur through: (i) selectivity -on an annual basis- whether to use graphs or not t, and selectivity of the variables to be graphed, (ii) graph design features, where colors, three-dimensional specifiers, and frames are used to enhance or degrade certain features of the graph (Gibbins *et al.*, 1990), and (iii) measurement distortion, where graphs are improperly constructed because the physical measurement of the numbers on the surface of the graph are not in direct proportionate to the underlying numbers they are representing (Tuft, 2001). Taylor and Anderson (1986) suggested seven indicators of materially distorted graphs or graph construction flows (GCF). These indicators are summarized in Table 1 below.

Table 1. Indicators of graph construction flows

Construction Flow	Explanation
Omitting the zero-base of comparison.	If zero is not included in a comparative graph, changes and/or differences are puffed up, and unimportant changes will look important.
Using rate of change graph time series.	In the rate-of change graph the vertical axis is divided logarithmically, while the horizontal axis representing time is divided at equal intervals. Thus, relative changes are not represented accurately
Using multiple-amount scales.	The use of multiple-amount scales on the same graph results in misrepresenting of relationships because many readers don't Understand.
Placing the most irregular stratum along the baseline, and the less variable stratum at or near the top of the graph.	The basis for reading the values of strata, or layers, is the distance between the plotted lines, not the distance from the horizontal axis. Placing the stratum showing marked irregularities along the baseline, and placing the less variable stratum at or near the top of the graph results in a misrepresentation of relationships.
Choosing the years to be presented.	The choice of the years to be graphed affects user's perceptions of firm performance (e.g., starting with the year of lowest performance makes that year appears to be the base of an increase instead of the bottom of a decline.
Reversing the order of time values used in the financial statements.	In a time-series graph, if the order of the time values represented on the horizontal axis is reversed (from right to left instead from left to right), then the firm's performance is perceived to be the reverse of actual performance.
Extending the scale range much beyond the highest or lowest points plotted on the graph.	A long scale range may occasionally produce a more realistic representation. However, a very long range may depress the picture, reduce the movement of the curve, and move it nearer to the base line.

Source: the author, based on Taylor and Anderson (1986)

3 Hypotheses development

The board of directors plays a fundamental role in monitoring and controlling top management's behavior and decisions (Fama and Jensen, 1983). According to Ntim and Soobaroyen (2013) the increased monitoring of management, improves the firm's voluntary disclosure. This could be attributed to the diversified expertise, knowledge and opinions of large boards, which improves their monitoring capacity and in turn, enhances corporate transparency and disclosure (Adam *et al.*, 2005). Several empirical studies report a significant positive relationship between board size and disclosure (e.g. Byard *et al.*, 2006; Akhtaruddin *et al.*, 2009; Allegrini and Greco, 2013). It's worth mentioning that the Jordanian corporate governance code (JCGC) gives the firms the flexibility in deciding their suitable board size. In Item 9, Chapter 2, the code states that: "*The administration of the company is entrusted to a board of directors whose members shall be not less than five and not more than thirteen, as determined by the company's memorandum of association*" (Jordan Securities Commission, 2009). The above discussion leads to the following null hypothesis:

H1: A significant negative relationship exists between board size and the level of graphical disclosure in the annual reports of Jordanian firms.

Fama and Jensen (1983) argue that the presence of independent (non-executive) directors on the board improves its effectiveness as a control mechanism. Their objectivity and independence enhances the board's monitoring and controlling roles. Indeed, their presence helps in limiting the opportunistic behavior of management (Ho and Wong, 2003). Furthermore, it lessens the benefits from withholding information and thus improves the level and quality of disclosure (Eng and Mak, 2003). Empirical research confirms that high percentage of independent directors on the board positively influences voluntary disclosure level (e.g. Lim *et al.*, 2007; Chau and Gray, 2010; Thangatorai *et al.*, 2013; Sartawi *et al.*, 2014). This leads to the following null hypothesis:

H2: A significant negative relationship exists between board independence and the level of graphical disclosure in the annual reports of Jordanian firms.

An Audit committee is a sub-committee of the board of directors that is responsible for overseeing the firm's accounting, internal control, and auditing activities (Jordan Securities Commission, 2009). Thus, it is considered as an effective monitoring mechanism that enhances the relevance and reliability of corporate reporting and mitigates the agency costs (Forker, 1992). Prior studies report a positive significant relationship between the presence of an audit committee and voluntary disclosure practices (e.g. Ho and Wong, 2003; Rosario and Flora, 2005; Barako *et al.*, 2006; and Yuen *et al.*, 2009). However, the JCGC

requires all firms listed on Amman Stock Exchange (ASE) to establish audit committees. Accordingly, all these firms are assumed to have audit committees. Furthermore, Kalbers and Fogarty, (1993) argue that the presence of an audit committee is one thing and its effectiveness is quite another. A major characteristic of the audit committee effectiveness is the frequency of its meetings during the year (Collier and Gregory, 1999). Prior empirical studies provide evidence that firms with higher frequency of audit committee meetings tend to report the weaknesses in their internal control systems (Krishnan and Visvanathan (2007). Furthermore, they are less engaged in fraudulent financial statement activities (Farber (2005), have lower levels of discretionary accruals (Xie *et al.*, 2003), report more accurate earnings forecast (Liu and Zhuang, 2011), and voluntarily disclose information on their web pages (Kelton and Yang, 2008). The above discussion leads to the following null hypothesis:

H3: A significant negative relationship exists between the effectiveness of audit committee and the level of graphical disclosure in the annual reports of Jordanian firms.

Firm size has been recognized in previous studies as one of the main drivers of voluntary disclosure. These studies, often, report a positive relationship between size and the level of voluntary disclosure (e.g., Eng and Mak, 2003; Lim *et al.*, 2007; Xiao and Yuan, 2007). Large firms incur greater agency costs than small firms because of the higher amount of outside capital they use. Furthermore, the wide network and operations of large firms provides management with a huge amount of information about the operations causing information asymmetry problem. Therefore, it is argued that large firms tend to voluntarily disclose more information to reduce agency costs and information asymmetries (Jensen and Meckling, 1976). Political cost can also be used to explain the tendency of large firms to disclose more information. Large firms are highly visible to the public and government, and thus are subject to higher scrutiny from both parties. Reducing these political costs requires the disclosure of more information (Watts and Zimmerman, 1990). The use of graphs in the annual report to communicate information is a costly process. However, according to the resource-based theory, large firms have the sufficient resources to produce graphs and include them in their annual reports. Indeed, previous studies in the area of graphical reporting find a positive relationship between size and the level graphical disclosure (Uyar, 2009 and 2011; Melis *et al.*, 2013). This leads to the following null hypothesis:

H4: A significant negative relationship exists between the firm size and the level of graphical disclosure in the annual reports of Jordanian firms.

Impression management theory proposes that management tend to highlight good or positive news

and downplay bad or negative news (Goundar, 2009). According to the agency theory, managers of profitable firms tend to voluntarily disclose more information to demonstrate for shareholders that they are acting to maximize their wealth and to keep their position and justify their compensation (Inchausti, 1997). From the scope of the political cost theory, profitable firms disclose more voluntary information to show the efficiency of their operations and thus avoid the cost of government intervention (Watts and Zimmerman, 1990). The signaling theory suggests that by disclosing more voluntary information, profitable firms aim to enhance investors' confidence and consequently acquire capital at low cost (Marston and Polei, 2004). Prior research on graphical reporting, demonstrate that the use of graph is positively associated with performance. For example, Steinbart (1989) finds that 74% of firms with increasing income included financial graphs in their annual reports. Beattie and Jones (2001) report a positive association between the firm's overall earnings performance and the use graphs. Uyar (2009 and 2011) finds that more

profitable firms disclose more graphs in their annual reports. This leads to the following null hypothesis:

H5: A significant positive relationship exists between the firm performance and the level of graphical disclosure in the annual reports of Jordanian firms.

4 Methodology

4.1 Population and sample

The population of the current study includes all Jordanian banks. The number of Jordanian banks is 16. The banking sector is chosen since it has been largely neglected in previous studies because of the common misconception that banks have different graphical disclosure practices from other business sectors (Melis *et al.*, 2013). Since the number of Jordanian banks is very small, it is more appropriate to create a total population sample. Therefore, all Jordanian banks are included in the sample. Table 2 shows summary statistics for these banks.

Table 2. Summary statistics for the sampled banks

Variable	Min	Max	Mean	S.D
Board size	4	13	8.4	1.54
Board independence (%)	0	100	0.51	0.24
Audit committee meetings	0	5	1.92	1.25
Total Assets (\$ million)	510	6,938	1,437	1,364
Net income (\$ million)	-3.5	112	179	356

The sample is composed of 13 traditional banks and 2 Islamic banks. These banks vary in size. Their total assets range between \$510 million and \$6.9 billion, with an average of \$1.4 billion. Performance measured by net income ranges between -\$3.5 million and \$112 million. The average bank age is approximately 34 years. In addition, the banks vary in the size of their board of directors with an average of 8.4 directors per board. Similarly, the percentage of non-executive directors ranges from 0 to 100%, with an average of 51%.

4.2 Data collection

The data set used in the current study consists of time series and cross sectional data. The time series variable observations consist of the years 2008 to 2013. The cross-sectional data are represented by the 15 Jordanian banks listed on ASE during the period of the study. Furthermore, the data set is a balanced panel data since there are no missing observations. The annual reports of the sampled banks for the years 2008- 2013 are the main source for the required data.

These reports are available on the banks' web pages. Their content is analyzed and the required data are extracted and entered into Stata 11.0.

4.3 Variables and model

4.3.1 Dependent variable

Graph usage is the dependent variable in the current study. This variable is measured by the number of financial graphs included in the annual report of each bank.

4.3.2 Independent variables

To identify the factors that explain graphical reporting usage in the annual reports of Jordanian banks, the following independent variables are investigated: board size, board independence, effectiveness of the audit committee, bank size, performance, growth and leverage. The definitions of these variable and the proxies used to measure them are presented in Table 3.

Table 3. Definition and proxies for the independent variables

Variable	Definition/Proxy
Board size	The number of directors on the board.
Board independence	The proportion of non-executive directors to total number of directors
Effectiveness of audit committee	Number of meetings during the fiscal year.
Audit quality	A dummy variable that equals to 1 if firm's accounts are audited by one of the "Big-4" firms, and 0 otherwise
Size	The bank's total assets at the end of the fiscal year
Performance	The bank's net income.

4.3.3 Model

The following econometric model is estimated to identify the factors that explain the graphical reporting usage by Jordanian banks:

$$GU = \beta_0 + \beta_1 BDS_{it} + \beta_2 BIN_{it} + \beta_3 EAC_{it} + \beta_4 SIZ_{it} + \beta_5 PRF_{it} + U_{it}$$

$$i = 1, \dots, 15 \quad t = 1, \dots, 6$$

Where:

GU	Graph usage
BDS	Board size
BIN	Board independence
EAC	Effectiveness of audit committee
SIZ	Bank's size
PRF	Performance
U	Error term, (0, σ^2)
B _k	Regression coefficients

The model is derived from previous studies and the theories on graphical reporting and voluntary disclosure. The model includes the stochastic term, U_{it} , to represent the factors not included in the model that might have an effect on graphical reporting usage by Jordanian banks.

5- Results

5.1 The extent and nature of graphical reporting practices in the annual reports of Jordanian banks

Overall, the results reveal that 64.4% (or 58 out of 90 reports) of the examined annual reports include at least one graph. This is far below what has been reported by other studies such as: Beattie and Jones (2001), Burgess (2002), Mather *et al.* (1996), Jouini (2013), and Yuar (2009). The number of graphs in the annual reports ranges between 1 and 6, with 55% of the reports including 2 graphs only. The total number of graphs analyzed is 185. Thus, the average number of graphs per annual report is 2.1 for the whole sample and 3.2 graphs based on, only, those reports including graphs. The importance given to these graphs is

reflected by their location within the annual report. In most cases, the graphs are reported, as a group, in the middle of the report and occupy between half page and two pages. These results might be explained by the unwillingness of some Jordanian managers to expand the communication techniques with stakeholders to include graphs (Courtis, 1997). Another possible explanation could be the managers' perception toward graphical reporting as being useless, and thus ignored by readers (Uyar, 2009). Or, simply, it could be the voluntary nature of graphical reporting as currently the Jordanian disclosure regulation lets the firm to decide whether or not it is possible to use graphs in their annual reports. In Article 4, Item 13, the regulation states that the annual report shall include "A chronology of the realized profits or losses, dividends, shareholders' net equity and the prices of securities issued by the Company, for a minimum period of five years or for the period since the establishment of the Company, whichever is less, together with graphic representation thereof where possible" (Jordan Securities Commission, 2005).

On the other hand, Panel A in Table (4) shows that net income, deposits, total assets, shareholders' equity and revenues are the most frequently graphed variables by Jordanian banks. The same variables are reported by Melis *et al.* (2013) as the most frequently graphed by European banks. However, amongst these variables, profitability- rather than revenues- is found to be the most frequently graphed. This may reflect greater emphasis by Jordanian banks on short-term profitability (as reflected by income), rather than on long-term growth (as reflected by revenues). In addition, Earnings per share (EPS) are graphed by 2% of the annual reports. Dividends per share (DPS) are not graphed at all. Further analysis of the annual reports of Jordanian banks reveals that these variables are reported as a narrative text rather than a graph. These findings are in line with what has been reported from Turkey by Uyar (2009). However, it is inconsistent with the findings reported from developed countries such as US, UK, Australia, Germany, France (Beattie and Jones, 2001; Jouini, 2013).

Table 4. Nature of graph usage in the annual reports of Jordanian banks

Panel A Variables graphed		Panel B Types of graphs used		Panel C Length of time series	
Variables	Percentage	Graphs	Percentage	Time	Percentage
Expenses	0.02	Bar	0.02	Three-year	0.02
Revenues	0.10	Pie	0.20	Five-year	0.89
Equity	0.12	Line	0.31	Ten-year	0.09
Loans	0.20	Column	0.47		
Deposits	0.25				
Earnings*	0.31				

* Mainly measured by net income

Panel B in Table 4 shows that three types of graphs are most frequently used in the annual reports of Jordanian banks. These are: column, line, and pie. However, column is found to be the preferred type of graphs for these banks to present information. This is similar to the findings reported from Hong Kong (Courtis, 1997), the US, UK, and Australia (Beattie and Jones, 2001), and Turkey (Uyar, 2009). Furthermore, the results show that Jordanian banks tend to use simple rather than multiple graphs. Almost 89% of the analyzed graphs are simple. As explained by Chekar and Martinez (2011), simply presented information are easily understood and memorized by the reader.

The number of years graphed are reported in Panel C in Table 4. The five-year time series is the most popular trend amongst Jordanian banks (89%). This is higher than the percentage reported from developed countries such as US (41%), France (60%), and UK (51%), Netherlands (75%), Germany (65%), and Australia (71%) (Beattie and Jones, 2001).

5.2 The presence of distortion in the graphical reporting in the annual reports of Jordanian banks

To investigate the presence of distortion in the graphical reporting in the annual reports of Jordanian

banks, the design of the 185 financial graphs included in 58 annual reports is analyzed in reference to the seven (GCF) suggested by Taylor and Anderson (1986). The results show that 32% of these annual reports contain improperly designed graphs. Furthermore, 43% of the graphs analyzed are improperly designed and distort the underlying information. This is higher than what has been reported by other studies. For example, Steinbart (1989) 11%; Beattie and Jones (2001) 30%. Table 5 shows the three types of GCF found in the annual reports of Jordanian Banks. Almost 57% of the improperly designed graphs are constructed without zero bases. According to Taylor and Anderson (1986) the absence of a zero base in a comparative graph puffs changes up and hence unimportant changes look important. Also, the table shows that in 37% of the improperly designed graphs the sequence of years on the horizontal axis is reversed. This may lead to incorrect interpretations of the presented information and create a misleading impression that the variable graphed is increasing. These findings imply that graphical reporting might be used by some Jordanian banks to create a certain impression, rather than enhance or provide incremental information.

Table 5. Graph construction flows in the annual reports of Jordanian banks

Construction flow	Number of graphs	Percentage
Using arithmetic graph rather than rate of change graph with time series	3	0.06
Reversing the order of time values used in the financial statements	17	0.37
Omitting the zero base of comparison	26	0.57
Total	46	100

5.3 Determinants of graphical reporting usage in the annual reports of Jordanian

To identify the factors that explain graphical reporting by Jordanian banks, the hypothesized econometric model presented in section 4.3.3 is estimated. Prior to model estimation, the appropriate transformation function is performed on some of the independent variables to reduce their disparity. The Pearson

correlation coefficients (r) for the independent variables are calculated (Table 6). The maximum value of (r) is 0.473, indicating no apparent evidence of severe collinearity. This conclusion is further supported by the VIF values of the independent variables. These values range between 1.19 and 1.74 (Gujarati, 2003).

Table 6. Pearson correlation matrix for the independent variables

Variables	BDS	BIN	EAC	SIZ	PRF
BDS	1				
BIN	0.473	1			
EAC	0.213	0.023	1		
SIZ	0.335	-0.157	0.385	1	
PRF	0.220	0.263	0.207	0.465	1

The Hausman test and the Breusch and Pagan LM test are used to identify which model is more appropriate for the data set: the Pooled Model, the Random Effects Model (REM) or the Fixed Effects Model (FEM). The results of both tests (shown in Table 7) suggest that the REM is the best model to

represent the data. The insignificant p-value of the Pesaran CD test (Table 7) indicates that there is no serial correlation problem in the data. To control for heteroscedasticity, a robust random effect GLS regression is estimated (Gujarati, 2003). A summary of the regression result is presented in Table 7.

Table 7 Random-Effect GLS Regression

Independent variables	Coefficient	p-value
Constant	11.907	0.042
BDS	-0.016	0.856
BIN	-1.390	0.008*
EAC	-0.043	0.702
SIZ	0.230	0.721
PRF	1.668	0.031**
No. Observations	90	-
Adj R ²	0.121	-
Wald Test	32.46	0.001
Hausman Test	2.97	0.936
Breusch and Pagan LM Test	66.94	0.000
Pesaran's CD Test	0.400	0.689

* Significant at 1% level, ** Significant at 5% level.

According to Table (7), the model explains almost 12% of the variation in graphical reporting amongst Jordanian banks. Furthermore, the high probability of the Wald statistic (.001) means that the independent variables are jointly significant in explaining differences in graphical reporting in the annual reports of Jordanian banks. Furthermore, Table (7) shows that only two variables are significantly associated with graphical disclosure in the annual report of Jordanian banks. Board independence (BIN) has a significant negative coefficient ($\beta=9.34$, $\rho=.041$). Thus, Hypothesis two is supported. This implies that non-executive directors in Jordanian banks are practicing their monitoring role efficiently. It seems that these independent directors are aware of the risk of using graphical reporting- by management- to influence the perception of stakeholders rather than satisfying their need for more information. Therefore, they oppose the extensive use of graphs in the annual reports. On the other hand, the association between Bank's performance PRF and graphical disclosure is found to be positive and significant at the .05 level ($\beta=1.668$, $\rho=0.031$). This means that Hypothesis six is not supported. This implies that the more profitable Jordanian banks tend to use graphs to enhance their positive achievements. This is similar to what has

been reported by Steinbart (1989) who found that 74% of US firms with increased net income include financial graphs in their annual reports, and by Beattie and Jones (2001) who found that the choice to use graphs is positively associated with the firm's overall earnings performance. However, the result is inconsistent with what has been reported by Uyar (2009, 2011) who did not find a significant influence for the firm's performance on the level of graph usage, and Jouini (2013) who found a significant negative association.

6 Conclusions, limitations and future research opportunities

There is a considerable amount of literature on graphical reporting. However, studies focusing on developing countries in general and Jordan in particular are lacking. This study extends previous studies by investigating graphical reporting practices in the annual reports of Jordanian banks.

The results show a moderate level of graph usage (64.4 percent) by Jordanian banks. The average number of graphs per an annual report is (2.1). These results are considered very low compared with other countries. However, they mean that there is a room for

improvement. The most frequently graphed variable is earnings measured mainly by net income. In addition, the column is most frequently used graph with five-year trend.

The study provides clear evidence for the presence of improperly designed graphs. This implies that graphical reporting might be used by some Jordanian banks to create a certain impression, rather than to enhance or provide incremental information for annual report users. Omitting the zero-base and reversing the order of time values are the most frequently used techniques to manipulate graphs design. Regulators in Jordan such as the Security Exchange Commission may need to develop a set of guiding principles for properly designed graphs. Firms wishing to use graphs in their annual reports should be encouraged to comply with these principles.

On the other hand, the results also show that banks with good performance tend to enhance their achievements by including more graphs in their annual reports. Furthermore, non-executive directors in Jordanian banks seem to be aware of the possibility of using graphs as an impression management tool by banks' managers. Accordingly, they are limiting their usage in the annual reports of these banks. Therefore, the Jordanian Accounting Association and the Jordanian Association of Certified Public Accountants may need to hold awareness and training sessions for their members (accountants and auditors) on the criteria of good-graph design and construction.

The study has some limitations. Therefore, the results should be interpreted cautiously. First, the scope of the study is limited to the Jordanian banking sector. Accordingly, conclusions drawn from this study cannot necessarily be applied to other countries and/ or sectors. Future studies may focus on other countries and sectors. Additionally, cross-country comparative studies can reveal interesting results on the differences in the graphical reporting practices amongst different countries. Second, the study focuses, only, on one tool of voluntary disclosure, that is; graph. Future studies may consider other tools for disclosing information such as the chairman's letter, and the management's letter to shareholders. Third, the study investigates the influence of six variables, only, on the level of graphical disclosure in the annual reports of Jordanian banks. Future studies may consider other variables such as firm's leverage and board structure. Fourth, the study uses the seven GCF suggested by Taylor and Anderson (1986) to investigate the presence of distortion in the graphs included in the annual reports of Jordanian banks. Future studies can use quantitative methods to investigate distortion such as the Graph Discrepancy Index (GDI) suggested by Tufte (2001) and the Relative Graph Discrepancy index (RGD suggested by Mather *et al.*, (2005).

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