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The financial aspects of the Corporate Responsibility Index in Egypt

A quantitative approach to institutional economics

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Abstract

Purpose – The purpose of this paper is to examine the financial aspects of high vs low-ranked firms in the Corporate Responsibility Index in Egypt, and to construct a *Z*-score model to discriminate between high- and low-ranked firms in the Corporate Responsibility Index.

Design/methodology/approach – This study empirically examines a comprehensive list of financial ratios for 24 firms listed in EGX30 for four fiscal years, 2007-2010. The authors calculate 90 financial ratios to provide better insights and evaluation of the firms' financial performance. The ordinary least square regression method and discriminant analysis are utilized to explain differences between the low- and high-ranked firms regarding their corporate social governance index.

Findings – The results show that corporate governance and corporate social responsibility (CSR) are positively related to the firms' financial performance in terms of sales turnover and customer loyalty. This suggests that in the long run, the market mechanism should be able to provide additional resources to those companies that are better at maximizing a widely defined bottom line of their social governance. The results also show that highly ranked firms are characterized financially by: strong bargaining power with suppliers; financing growth in fixed assets using debt mainly.

Originality/value – The study contributes to the literature in terms of providing practical insights on the financial strategies that help support effective CG and CSR in Egypt. In addition, this study offers a unique quantitative attempt to measure and examine the benefits of incorporation of socioeconomics into business practices.

Keywords Egypt, Corporate governance, Financial performance, Institutional economics, Corporate Responsibility Index

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1. Introduction

The public policy that institutionalizes the relationships between corporations and stakeholders is indeed able to improve the welfare of the society. These relationships involve social activities with members in the society and internal governance aspects of corporate affairs. The common understanding is that corporate social responsibility (CSR) involves the firms' undertaking a set of actions that have the potential to increase costs. To be economically sustainable, the sources of additional costs need to be offset by some potential benefits. The first benefit is represented by the creation of reputational capital that may help the company obtain more favorable terms of trade in negotiations with stakeholders (Cornell and Shapiro, 1987). The second benefit considers that CSR may positively affect workers' productivity (Agell and Lundberg, 2003; Akerlof, 1982; Bewley, 1999; Fehr and Schmidt, 1999, 2006; Fehr and Falk, 2002; Sobel, 2002). It terms of profitability, being considered a performance metric, corporate social involvement can be evaluated through its effects on costs, sales growth and assets investments. From the cost point of view, the corporate involvement in social activities might be seen as expenses that are reported in income statements. As far as customers are concerned, the extent of their appreciation to the company's social contribution is reflected by growth of sales revenues. The interaction between the latter and expenses related to social activities results in a net income that is responsive to the company's social responsibility. In addition, the social involvement also may be reflected in the assets structure. That is, a socially responsible company may devote part of its investments in fixed assets that do not generate related earnings for the company. Therefore, company's involvement in social activities has direct effects on corporate financial performance. In this case, financial ratios are very convenient measures of the interaction between corporate income statements and balance sheets.

The literature on the aspects of good corporate governance has shown that corporate governance is strongly related to CSR (Beltratti, 2005; Pava and Krausz, 1996; Stanwick and Stanwick, 1998). This relationship is based on the understanding that CSR reflects to the extent to which the company is able to govern the interests of its stakeholders appropriately. Insofar as the latter represent sources of income (i.e. customers) and expenses (i.e. suppliers, lenders and non-earning social responsibilities), the link between CG, CSR and financial performance merits thorough examination. In this respect, the literature on socioeconomics presents many practical governance structures of interest to stakeholders. These structures are present within the domain of institutional economics. The authors of this study offer a practical and quantitative link between CSR and aspects of corporate financial performance. This link is based on the understanding that the establishment of a Corporate Responsibility Index is a formal institutional attempt to impost humanly formulated constraints that shape human interaction (North, 1994).

It is important to study the institutional determinants of (CSR) because firms are embedded in a broad set of political and economic institutions that affect their behavior (Campbell, 2007). Institutional analysis of CSR attempts to assess critically and judge the aptness of firms' CSR efforts in addition to the role, contribution and responsibility of businesses in the society (Matten and Moon, 2008). That is, the institutional theory explicitly places CSR within a wider field of economic governance characterized by different modes including the market and state regulations instead of perceiving CSR as a set of purely voluntary actions (Brammer *et al.*, 2012).

The association between institutional theory and CSR is two-fold. First, this association brings into account interactions and interdependencies among stakeholders.

Second, it creates rationalized myths that standardize firm practices to implement CSR to some extent, leading to homogenization of the institutional environment and adherence to socially responsible behavior (Kunapatarawong and Martínez-Ros, 2013). The institutionalization of CSR can be seen in the diffusion of CSR departments within companies, the spread of stock market indices related to sustainability, the proliferation of branding initiatives and even an ISO standard on CSR (Campbell, 2007). Institutional theory, therefore, contributes to the study of CSR on various levels. The descriptive level allows a more accurate grasp of the actually meaning of CSR in a specific institutional setting. The managerial-level helps assign different responsibilities to private corporations in different business contexts (Brammer *et al.*, 2012).

The authors address the Egyptian corporate governance best practices by examining the financial aspects of the Egyptian Corporate Responsibility Index. The Index was constructed recently to rank EGX30 companies on fixed and national index. The index uses corporate governance and CSR norms and standards to evaluate the actions and programs of the listed firms. The success of a good corporate social governance system in both advanced and emerging markets helps integrate this system into the global economy (Bebchuk *et al.*, 2009; Owen, 2004). The review of the relevant literature shows that almost all of the studies that have addressed Egyptian corporate governance practices cover only the level of adherence to standards and codes (World Bank-IMF, 2001, 2004, 2009). There has been no explicit examination of the financial aspects that characterize good corporate social governance.

2. Research objectives

This study addresses the following objectives:

(1) determine significant effects of firm financial indicators on the high- vs low-ranked firms in the Corporate Responsibility Index in Egypt; and

(2) develop a model that shows how to use the financial indicators to monitor firms' ranking in the Corporate Responsibility Index.

The rest of the study is organized as follows. Section 3 discusses the relevant literature on corporate governance and corporate financial performance. Section 4 reviews the relevant studies on the relationship between CSR and corporate financial performance. Section 5 reviews developments relative to the state of corporate governance in Egypt. Section 6 discusses the data, the construction of the Corporate Responsibility Index, and the estimation methods. Section 7 presents the results. Section 8 concludes.

3. Corporate governance and financial performance

Corporate governance has received much attention as a result of Adelphia, Enron, WorldCom and other high-profile scandals that have served as the impetus for recent US regulations, such as the Sarbanes-Oxley Act of 2002. This act is considered the most sweeping corporate governance regulation of the past 70 years (Byrnes *et al.*, 2003). The literature includes many attempts to relate corporate governance practices to firm performance based on the understanding that better corporate governance is related to better performance. That is, better-governed firms should perform better than worse-governed firms. Corporate governance studies have been derived from the agency theory, which opens a vast area of research into the aspects of agency problems (Beltratti, 2005; Shleifer and Vishny, 1997)[1]. The shared understanding in these studies is that effective corporate governance reduces so-called control rights conferred by stockholders and creditors on managers. The eventual outcome is an increasing probability that managers invest in positive net present value projects.

Botosan and Plumlee (2001) found a material effect of expensing stock options as return on assets. Based on Fortune 1,000 firms during 1997-1999, Fich and Shivdasani (2005) found that firms with director stock option plans have higher market-to-book ratios and higher profitability. Gompers *et al.* (2003) use Investor Responsibility Research Center data and concluded that firms with fewer shareholder rights have lower firm valuations and lower stock returns.

4. CSR and financial performance

Verschoor (1998) and Becchetti *et al.* (2008) tested the relationship between CSR and corporate performance. Almost all of these studies have been published in business rather than economics or finance periodicals even though the topic of CSR is obviously relevant to both. This anomaly offers the authors of this study an advantage of providing an original contribution to this specific field by using methodological approaches that are common in finance studies.

The existing empirical research can be divided into three groups. The first group has found a positive relationship between CSR and corporate performance (Pava and Krausz, 1996; Preston and O'Bannon, 1997; Ruf *et al.*, 2001; Simpson and Kohers, 2002; Solomon and Hansen, 1985; Stanwick and Stanwick, 1998).

The second group has found no significant associations between CSR and corporate performance (McWilliams and Siegel, 2000). Other studies have found inconclusive results (Anderson and Frankle, 1980; Freedman and Jaggi, 1986).

The third group has documented negative relationships between CSR and corporate performance; the findings are consistent with the managerial opportunism hypothesis (Freedman and Jaggi, 1982; Ingram and Frazier, 1980; Preston and O'Bannon, 1997; Waddock and Graves, 1997). However, Becchetti *et al.* (2008) found that social responsibility implies decisions that may lead to higher labor costs but may enhance involvement, motivation and identification of the workforce with company goals with positive effects on productivity.

The debate on the relevance of CSR to corporate performance is polarized around two opposite perspectives (Becchetti *et al.*, 2008). The first perspective considers CSR to be a violation of managers' mandatory duties when it materializes as higher expenditures that reduce shareholders' wealth (Friedman, 1962). Accordingly, the authors developed the hypotheses that follow:

H1. A positive relationship exists between a firms' ranking in the CSR index and expense control ratios.

H2. A negative relationship exists between a firms' CSR ranking and liquidity, profitability, dividends per share, market value added and market-to-book ratios.

In the current three-pillar system (institutions, corporations and civil society), it is possible to observe stakeholders creating bottom-up pressures on corporations (Adriani and Becchetti, 2002). This pressure induces corporations to signal their social responsibility so as to minimize stakeholder attrition (Freeman, 1984). Should any negative externalities occur as a result of corporate actions, there must be certain institutional arrangements that prevent or reduce any harm to stakeholders' interests (Becchetti *et al.*, 2007; Tirole, 2001). Accordingly, the authors developed the hypotheses that follow:

H3. A positive relationship exists between a firms' CSR ranking and asset efficiency.

H4. A negative relationship exists between a firms' CSR ranking and leverage ratios.

5. Corporate governance and CSR: the Egyptian experience

In Egypt, empirical studies on corporate governance aspects as well as CSR have been few in number. In addition, it is difficult to access the proper data about firms' CSR programs. The section that follows discusses in detail the developments of corporate governance in Egypt.

5.1 Developments in corporate governance arrangements in Egypt

Corporate governance developments in Egypt have attained several milestones. The first was accomplished by the late 1990s when a well-tailored economic reform program was established with the objective of improving the Egyptian economic environment and business infrastructure by targeting a high GDP growth rate. The second milestone was accomplished by 2001 when the World Bank-IMF Reports on the Observance of Standards and Codes (ROSC; World Bank-IMF, 2001) started to assess countries' corporate governance and CSR practices. This report stated that Egypt's corporate governance system is framed by French civil law for corporations as well as the securities depository law and the new capital markets law. The third milestone was accomplished in 2003 with the establishment of the Egyptian Institute of Directors (EIoD). Its objective is to equip the Egyptian executives with the proper, relevant knowledge to enhance the social governance activities of their companies. The EIoD established codes of corporate governance for private and state-owned companies. The EIoD has successfully changed the legal and regulatory framework by tightening insider trading-related provisions, strengthening disclosure rules, requiring companies to institute board-level audit committees and modernizing the accounting and auditing framework to align with international standards. In July 2002, new listing rules went into effect that increased disclosure and corporate governance requirements for listed firms and the Egypt Stock Exchange renewed its commitment to enforce the listing rules. As of September 2003, Egypt complied with the OECD Principles of Corporate Governance. The last milestone was noticed in the 2009 ROSC: the report mentioned that the Capital Markets Authority (CMA) in Egypt created a special Corporate Governance Department and the Egyptian Stock Exchange (EGX) began to enforce its listing rules consistently, thus leading to an impressive wave of de-listings from 1,148 in early 2002 to 333 by mid-2009 (World Bank-IMF Program, 2009).

6. Methodology and data

6.1 Data

The data for this study were obtained from "Egypt for Information Dissemination" (EGID)[2]. The data cover the years 2007-2010 for the 30 nonfinancial firms listed in the Egyptian CSR Index provided by the EIoD[3]. These firms also are listed in the stock market index (EGX100).

6.2 Dependent variables

The method used in this study was designed to measure the quantitative effects of financial information on the firms' rankings in the CSR Index. The dependent variable is firms' scores in the CSR index for four years, 2007-2010. The CSR index was launched on March 22, 2007, as a result of cooperation between the EIoD, the Egyptian Corporate Responsibility Center and Standard & Poor's to create an Environment, Social and Governance (ESG) Index for Egypt. This cooperation has resulted in the first index in the MENA region and the second in the world. The Index was named The Egyptian Corporate Responsibility Index. It measures the volume of information made available by companies on their activities in corporate governance, environment and social responsibility. This index also ensures selection of securities that are representative of the Egyptian equity market based on size and liquidity. Companies listed in the EGX100 index are evaluated on an annual basis to select the 30 companies that can be listed on the CSR Index. The evolution and preparation process of Index are explained on the EIoD website[4]. The list of companies and their rankings across the Index are provided in Table AI.

6.3 CSR index evaluation process[5]

The index requires two screening processes. The first focusses on the environment and social indicators. The second focusses on corporate governance indicators. The evaluation also has two stages as follows.

6.3.1 First stage. This stage involves evaluation of the company's disclosure practices based on the information it provides to the public in its annual report, website, press releases or disclosures made to the EGX. This information covers the following key areas:

Ownership structure and shareholder rights, such as:

- the number of issued and outstanding ordinary shares;
- the contents of any corporate governance charter or code of best practices; and
- the description of share classes provided.

Financial and operational information, such as:

- the company's accounting policy;
- annual financial statements according to an internationally recognized accounting standard (IFRS/US GAAP);
- a basic earnings forecast of any kind;
- revenue structure (detailed breakdown); and
- the ownership structures of affiliates.

Board and management structure and process, such as:

- details about directors other than name and title;
- a list of board committees and the names of all members of each existing committee; and
- attendance records for board meetings.

Corporate governance and corruption, such as:

- policy and procedures on whistle-blowing and insider trading;

- contribution to political parties; and
- disclosure of policy and procedures on bribery and corruption.

Business ethics and corporate responsibility, such as:

- publication of a CSR report; and
- social and environmental performance in operational MD&A or operational analysis.

Environment, such as:

- emissions of greenhouse gases, NOx, SOx and other emissions;
- defined targets related to emissions; and
- total water use by source.

Employees, such as:

- programs for career development;
- information on policy/rules related to healthcare;
- number of strikes/lockouts and the number of employees involved; and
- the gender breakdown of total workforce.

Community, such as:

- explicit policy/statement regarding community investment; and
- company participation in public-private initiatives for community development.

Customers/product, such as:

- number of customer satisfaction surveys conducted in a year;
- procedures and programs for adherence to laws, standards, and voluntary codes related to marketing communications including advertising, promotion and sponsorship; and
- mechanism for redressing grievances and feedback from customers.

6.3.2 Second stage. This stage involves evaluation of the company's practices by checking the news available in the media, newspapers, specialized magazines and CSR reports. This process also may involve contacting the regulatory agencies, ministries and NGOs to determine whether there is any adverse information of or violation made by the company. Constituent weightings consider the following aspects:

1. quantitative score: each company that trades on the EGX is assigned a quantitative ranking based on the three factors of transparency and disclosure of corporate governance, environmental practices, and social practices;
2. qualitative score: independent sources of information, news stories, websites and CSR filings are used to evaluate the actual performance of the company on a scale of 5-1;
3. composite score: a composite score is calculated for each company by summing the qualitative score and the quantitative score; and
4. each company's weight in the index is determined as a function of its ESG score.

6.4 Independent variables

The independent variables include the fundamental financial ratios that are examined in studies of fundamental analysis in developed and developing markets (Beaver, 1968; Bellemore and Ritchie, 1974; Corrado and Jordan, 2002; Courtis, 1978; Eldomiaty, 2004, 2006; Eldomiaty *et al.*, 2007; Emery and Finnerty, 1997; Foulke, 1968; Fraser and Ormiston, 2004; Myer, 1969; Johnson, 1971; Lev and Kunitzky, 1974; Soldofsky and Olive, 1974; Strong, 2001; Van Horne and Wachowicz, 1995) but are not disclosed in any of the stock market publications in Egypt. The fundamental financial ratios examined in this study are listed in the Appendix 2.

6.5 Model estimation

Because the data are a cross-sectional, time-series panel, the Hausman specification test (Hausman, 1978; Hausman and Taylor, 1981) is required to determine whether the fixed or random effects model should be used. The test looks for the correlation between the observed x_{it} and the unobserved λ_k, thus is run under the hypotheses that follow:

$$H0: \operatorname{cov}(x_{it}, \lambda_{\mathrm{k}}) = 0$$

$$H1: \operatorname{cov}(x_{it}, \lambda_{\mathrm{k}}) \neq 0$$

where x_{it} = regressors and λ_k = error term.

The results of the test show that the coefficient of λ_k is insignificant at the 1 percent level. Therefore, the random effect model is relevant and appropriate. The issue of linearity vs nonlinearity is addressed and examined as well. Regression Equation Specification Error Test (Ramsey, 1969; Sapra, 2005; Thursby, 1979; Thursby and Schmidt, 1977; Wooldridge, 2006) is employed to test the two hypotheses that follow:

$$H0: \ \hat{\gamma}^2, \hat{\gamma}^3 = 0$$

$$H1: \ \hat{\gamma}^2, \hat{\gamma}^3 \neq 0$$

The null hypothesis refers to linearity and the alternative refers to nonlinearity. The results of the F-test ($\alpha = 5$ percent) show that the F-statistic is greater than the critical value, which leads to the rejection of the null hypothesis; thus a nonlinear model is appropriate[6]. The estimating equation of the random effect nonlinear model takes the form of least squares dummy variables as follows:

$$y_{tk} = \alpha_k + \sum_{i=1}^{k} \beta_{ik} X_{itk}^2 + \lambda_k + \upsilon t_k$$

where $t = 1, \ldots, n$; k is the number of firms in each group; y_{tk} the CSR index; X_{itk} financial ratios as classified in the Appendix 2; λ_k the random error term from the individual effect; and υ_{tk} the random error.

7. Results and discussion

This section shows the regression estimates for various financial components against two levels of the Corporate Responsibility Index; that is low- vs highly ranked firms. This section also includes an examination of the robustness of the estimates for the low- and highly ranked firms. The robustness is carried out by regressing the financial components using the entire sample. The understanding is that the robust estimate of a coefficient does not change its significance and trend. The objectives are to determine the robust financial aspects that are associated with low- vs the highly ranked firms and at the same time are less likely to change the significance and the trends. The results are reported in Table I.

Table I shows the financial determinants of firms listed in Corporate Responsibility Index. The results show that CSR is positively associated with many financial factors such as cash ratio, fixed assets turnover, account receivables turnover, sales annual growth, total debt/working capital, earnings yield and annual growth of EBIT per share. The positive estimate of the accounts receivables turnover provides an indication that the efficiency of the firm's collection policy affects its involvement in CSR. This result is considered a significant indication that when a firm builds good customer relationships, it is able to return these benefits to the society. It is quite obvious that the customers would eventually receive certain benefits from their strong loyalty to the firm. The improvement in the collection of accounts receivables and customers trust lead to improvements in other financial factors such as cash ratio, earnings yield and annual growth of EBIT per share. The positive coefficients of sales annual growth, earnings yield and annual growth of EBIT per share strongly support the positive estimate of the accounts receivables. These results indicate that the high involvement in CSR is positively and significantly associated with sales revenue and customer relationships. This result is supported by recent related findings in the literature such as Acharya *et al.* (2013). The positive effects of sales growth are extended to high fixed asset turnover as corporate social involvement increases. The positive coefficient of total debt/working capital indicates that highly ranked firms

Predictors	Estimates for total sample
Constant	18.818
$(\text{Cash ratio})^2$	0.163 (1.903)*
$(\text{Fixed assets turnover})^2$	0.026 (2.767)***
$(\text{Accounts receivables turnover})^2$	0.009 (2.492)**
$(\text{Accounts payables turnover})^2$	−0.036 (−3.037)***
$(\text{Net worth/fixed assets})^2$	0.004 (1.378)
$(\text{Sales annual growth})^2$	0.267 (2.036)**
$(\text{Operating leverage})^2$	−0.003 (−1.277)
$(\text{Total debt/working capital})^2$	0.011 (1.831)*
$(\text{Short-term debt/total debt})^2$	1.494E−6 (1.535)
$[(\text{Net income} + \text{interest})/\text{interest}]^2$	−3.725E−9 (−1.893)*
$(\text{Market value of common stock/long-term debt})^2$	−1.949E−11 (−2.100)**
$(\text{Earnings yield})^2$	0.199 (1.476)
$(\text{Price-earnings ratio})^2$	−6.128E−5 (−2.303)**
$(\text{Annual growth of EBIT per share})^2$	0.009 (3.084)***
$\overline{R}^2$	0.264
n	98
F-statistic	3.414***
Durbin-Watson	1.366

Notes: The table shows the regression coefficients (stepwise-backward) for the financial determinants of Corporate Responsibility Index rankings. The dependent variable is Egypt's Corporate Responsibility Index ranking. The *t*-statistics are shown in parentheses. The multicollinearity is examined by the variance inflation factor (VIF) and variables associated with VIF > 5 are excluded. Outliers are detected and excluded as well. *,**,***Significant at 10, 5, 1 percent level, respectively

Table I.
Financial determinants of Egypt's Corporate Responsibility Index

on the CSR index depend increasingly on debt financing. This result indicates that highly ranked firms are not relatively exposed to the equity market pressures.

The results also show that CSR is negatively associated with many financial factors such as accounts payables turnover, net income + interest/interest, equity market value/long-term debt and price-earnings ratio. The negative coefficient of the accounts payable turnover indicates an opposite direction of the firm's attitudes toward its suppliers. It is quite obvious that highly ranked firms on the CRS index do not care about their suppliers as much as they do about customers. The interpretation of the negative coefficient of net income + interest/interest can be linked to the above mentioned positive coefficient of total debt/working capital. That is, the high dependence on debt financing reduces the corporate ranking on the index as the amount of debt servicing (interest) increases. The negative coefficients of equity market value/long-term debt and price-earnings ratio indicate that the involvement of highly ranked firms in CSR programs is not appreciated by equity holders. This negative association is opposite to other findings-related studies such as Ammann *et al.* (2011).

7.1 How is the financial information used to monitor firms' rankings in Egypt's CSR index?

The answer to this question derives from the results reached in the above section. That is, the results reveal that major differences exist between low- and highly ranked firms in the Corporate Responsibility Index. The regression results in Tables I and II above show, in general, that many financial ratios are significant in the case of low- as well as highly ranked firms. These results raise a practical question regarding how firms' managers and investors use financial information to differentiate between low- and highly ranked firms. In this case, the discriminant analysis provides an efficient approach by which to examine this concern. The issues related to the components of the discriminant analysis are discussed below.

7.1.1 Discriminant, content and construct validity. The effectiveness of the discriminant analysis requires a test for discriminant, content and construct validity (Podsakoff and Organ, 1986). In this case, the classifications as well as the use of the financial ratios provide a quite distinctive dimensionality. This means that the issue of discriminant validity is well-addressed. Regarding the issues of content and construct validity, the financial ratios are drawn from relevant literature that adequately provides a multidimensional perspective. In addition, these ratios provide adequate

Components of the *Z*-models	Equation coefficients[a]
(Net worth/fixed assets)^2	0.02
Eigenvalue[b]	0.101
% of variance	100%
Canonical correlation	0.303
Wilks-λ	10.908
x^2	4.468**
n	49

Notes: [a]Standardized Canonical Discriminant Function Coefficients; [b]The variance in a set of variables explained by a factor or component and denoted by λ. An eigenvalue is the sum of squared values in the column of a factor matrix, or $\lambda_k = \sum_{i=1}^{m} a_{ik}^2$ where a_{ik} is the factor loading for variable i on factor k, and m is the number of variables. **Significant at 5 percent level

Table II. Components of the discriminant model for firms' low and high ranks on the Corporate Responsibility Index coverage of the important contents and therefore provide a good basis for content validity (Nunnally, 1978). Because many related studies have empirically examined the variables in the literature of financial fundamental analysis as well as corporate governance, these variables provide adequate evidence of construct validity.

7.2 Method

The discriminant analysis is the most common technique used to develop *Z*-score models (Hair *et al.*, 1995; Manly, 1998). The discriminant analysis can be used to classify an observation into one of several a priori groupings dependent upon the observation's individual characteristics. The simplest approach involves the use of a linear combination of the *X* variables:

$$Z = a_1 X_1 + a_2 X_2 + \ldots + a_p + X_p$$

7.2.1 The Z-score models. The authors derived one nonlinear discriminating function with its *Z*-index (*Z*-model). This procedure develops a discriminating function that can help predict the groupings of companies in the Egyptian Corporate Responsibility Index based on the value of the financial determinants. The stepwise selection algorithm produced the ratio of net worth/fixed assets as predictor of groupings.

Table II shows that the discrimination between low- and highly ranked firms on the Corporate Responsibility Index is quite easily reached by monitoring the ratio of net worth/fixed assets. This means that the corporate responsibility activities can easily be monitored by observing the proportion of fixed assets financed by equity.

The positive coefficient indicates that low-ranked firms on the Corporate Responsibility Index are associated with higher net worth/fixed assets. This is quite evident as the average net worth/fixed assets for the highly ranked firms = 2.56, and the average for the low-ranked firms = 34.32.

Although the two groups are not equal in terms of size, the model can be used operationally[7]. The authors calculated the cut-off points on the *Z*-Scale using the estimated prior probability ratios as ln (*P*1/*P*2), where *P*1 = the prior probability of low-ranking firms and *P*2 = the prior probability of high-ranking firms. The cut-off points on the *Z*-Scale are shown in Table III.

7.2.2 Relative contribution of the model's discriminatory power. The common approach to assessment of the relative contribution is based on measurement of the proportion of the Mahalanobis D^2-distance between the centroids of the two constituent groups accounted for by each variable (Mosteller and Wallace, 1963; Taffler, 1981, 1983) (Table IV)[8].

7.2.3 The accuracy matrix of the Z-model. In the multigroup case, the discriminant analysis produces a measure of success. This measure results in a classification table or accuracy matrix (or jack-knife test) as shown in Table V.

Table VI shows that Type I and II errors are less than H (hits) in both levels of low- vs high-ranking firms.

Table III.
The cut-off points for firms' low and high rank on the corporate social responsibility index

Prior probability	Low-ranking firms	High-ranking firms	Cut-off points
(Net worth/fixed assets)^2	49%	51%	0.04

Table VI shows that the ratio of net worth to fixed assets provides fairly good grouping predictions (65.3 percent) of the low- and highly ranked firms on the Corporate Responsibility Index. The authors believe that the accuracy of the predictions could improve significantly as the number of observations increases. The reason is that the Corporate Responsibility Index in Egypt was developed recently.

8. Conclusion

In reality, corporate responsibility is a multifaceted, complex phenomenon that involves a set of actions that significantly affect several dimensions of financial performance. The purpose of this study is to examine the relationship between corporate responsibility activities and financial performance. The ultimate target is to emphasize on the financial determinants that reflect corporate aspects of social as well as governance activities. Those two dimensions constitute the newly Corporate Responsibility Index in Egypt.

This study concludes that highly ranked firms in terms of social and governance aspects are characterized financially as follows:

- the improvement in the collection of accounts receivables and customers trust lead to improvements in firm's liquidity and profitability;

Components of the *Z*-model	Relative contribution[a]
(Net worth/fixed assets)^2	100%

Note: [a]Mosteller-Wallace measure

Table IV. Relative contribution of the model's discriminatory power

Actual group membership	Predicted group membership: Quartile 1	Quartile 4
Quartile 1	H	M_1
Quartile 4	M_2	H

Notes: H (hits) stands for correct classifications; M (misses) stands for misclassification. M_1 represents Type I error and M_2 represents Type II error. The jack-knife test, or Lachenbruch Holdout Test (Lachenbruch, 1967) is the readily statistical test that produces the classification table

Table V. The accuracy matrix of the discriminant analysis

Actual group membership	No. of cases	Predicted group membership: Low-ranking firms	High-ranking firms
Low-ranking firms	24	7 29.2%	17 70.8%
High-ranking firms	25	0 0.00%	25 100%

Note: The percentage of grouped cases is correctly classified at 65.3 percent

Table VI. Lachenbruch Holdout Test (jack-knife test), low-high corporate social responsibility index of firms

- high fixed asset turnover which is mainly financed using debt (thus less exposure to equity market pressures) that adds to the burdens of debt servicing;
- do not care about their suppliers (in terms of accounts payables) as much as they do about customers (in terms of sales growth); and
- involvement of highly ranked firms in CSR programs is not appreciated by equity holders.

8.1 Implications

The results of this study carry important and practical implications for corporate managers as well as owners. The highly ranked firms pay significant attention to customer relations management with positive trends in accounts receivables and sales turnover and also experience a negative trend in accounts payable. That is, highly ranked firms experience high bargaining power with their suppliers in terms of high accounts payable turnover.

This conclusion calls for managers to pay significant attention to effectively communicate the firm's social involvements and aspects of good governance to their customers. On the other hand, managers who work for highly ranked firms are not under pressure from stakeholders when corporate responsibility activities take place. The positive coefficient of total debt/working capital indicates that highly ranked firms depend increasingly on debt financing. This conclusion carries another important implication that highly ranked firms prefer debt financing to avoid as much as possible exposure to equity market pressures. This conclusion also is obvious from the negative and significant estimate of the market-to-book ratio, which indicates that the involvement of highly ranked firms in CSR programs is not appreciated by equity holders in the stock market.

This study reaches a robust conclusion that net worth to fixed assets ratio could be utilized to differentiate between low- and highly ranked firms in terms of their contribution and adherence to corporate social and governance activities. This result shows that business owners of large companies are quite aware of the benefits of social involvement and good governance, although stockholders in the stock market do not share this awareness. The authors consider this conclusion a threat to the value as well as the future of CSR and aspects of good governance.

The general results of this study provide evidence of the usefulness of financial measures to examine corporate social and governance aspects. That is, investments in social activities, costs of social responsibilities and potential revenues are measured, reported and published in the financial statements where many useful ratios can be used as indicators of corporate social and governance aspects.

8.2 Limitations and future research

The most readily observable limitation is that this study examines only the 30 firms listed in the Corporate Responsibility Index. This is an inevitable limitation as the index includes only 30 companies. Therefore, the results may not be generalized to the awareness of the entire Egyptian market. The results call for an examination of the same relationships in a larger sample of firms. The results also are limited to the period 2007-2010 when the index was constructed and developed. An ongoing, updated examination of the same relationships is warranted.

Notes

1. Control rights are the amount of discretion or control exerted by managers in the allocation of investors' funds. Cash flow rights are another mechanism of managerial control that can be mitigated via ownership by large investors (concentrated ownership). Shleifer and Vishny (1997) stated that these mechanisms also have potential for an abuse because large shareholders can expropriate wealth from smaller shareholders.

2. EGID (see www.egidegypt.com/) acts as an Application Service Provider (ASP) by hosting brokerage firms' servers.

3. The EIoD (see www.eiod.org/) works under the supervision of the Egyptian Financial Supervisory Authority. The authors are grateful for the continuous support and assistance provided by the EIoD staff.

4. www.eiod.org/newsdetails.aspx?ID = 19

5. Index evolution and preparation process are explained on the EIoD website www.eiod.org/newsdetails.aspx?ID = 19

6. $F-\text{statistic} = (\text{SSE}_R - \text{SSE}_U) \div J/\text{SSE}_U \div (T-K)$ where SSE_R and SSE_U are the sum of squared errors for the restricted and unrestricted models, respectively, J refers to the two hypotheses under consideration, T is the number of observations, and K is the number of regressors.

7. The prior probability ratio is an estimate of the proportion of companies with a ratio profile more similar to that of groups 1 and 2.

8. $P_j = c_j(\bar{r}_{jf} - \bar{r}_{js}) / \sum_{i=1}^{4} c_i(\bar{r}_{if} - \bar{r}_{is})$ where P_j is the proportion of the D^2-distance accounted for by ratio j, $\bar{r}_{if}$ and $\bar{r}_{is}$ the means of the below-median and above-median groups for ratio i, respectively.

9. This classification is most popular in many corporate finance and investment textbooks such as Bodie *et al.* (2003), Corrado and Jordan (2002), Emery and Finnerty (1997), Radcliffe (1997), Ross *et al.* (2012), Shapiro and Balbirer (2000) and Strong (2001).

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Appendix 1

Egyptian Corporate Responsibility Index "S&P/EGX ESG Index"

Company name	*Rank 2007*
Lecico Egypt	1
Egyptian Company for Mobile Services (Mobinil)	2
Telecom Egypt	3
Oriental Weavers	4
Egyptian Financial Group-Hermes Holding Company	5
Sidi Kerir Petrochemicals	6
National Development Bank	7
Alexandria Mineral Oils Company	8
Orascom Telecom Holding (OT)	9
Credit Agricole Egypt	10
Misr Chemical Industries	11
Egyptian Transport (EGYTRANS)	12
Six of October Development & Investment (SODIC)	13
Olympic Group Financial Investments	14
Medinet Nasr Housing	15
Raya Holding For Technology & Communications	16
Naeem Holding	17
Orascom Construction Industries (OCI)	18
Commercial International Bank (Egypt)	19
Mena Touristic & Real Estate Investment	19
Heliopolis Housing	19
EL Ezz Aldekhela Steel-Alexandria	22
Housing & Development Bank	23
Egyptian Kuwaiti Holding	23
B-Tech	23
United Arab Shipping	26
Nile Matches	27
EI Ezz Steel	28
GB AUTO	29
T M G Holding	29
Company name	*Rank 2008*
Orascom Construction Industries (OCI)	1
Egyptian Company for Mobile Services (Mobinil)	2
Commercial International Bank (Egypt)	3
Egyptian Transport (EGYTRANS)	4
Telecom Egypt	5
Lecico Egypt	6
GB AUTO	7
Raya Holding For Technology & Communications	8
Oriental Weavers	9
T M G Holding	10
Sidi Kerir Petrochemicals	11
Orascom Telecom Holding (OT)	12
Credit Agricole Egypt	13
Alexandria Mineral Oils Company	14
Misr Chemical Industries	15
Heliopolis Housing	16

Table AI.
Corporate social responsibility index for 2007-2010

(*continued*)

Egyptian Corporate Responsibility Index "S&P/EGX ESG Index"	
Six of October Development & Investment (SODIC)	17
Olympic Group Financial Investments	18
Medinet Nasr Housing	19
Egyptian Kuwaiti Holding	20
National Development Bank	21
Nile Matches	21
Housing & Development Bank	23
B-Tech	24
Naeem Holding	24
Mena Touristic & Real Estate Investment	24
United Arab Shipping	27
Egyptian Financial Group-Hermes Holding Company	28
EL Ezz Aldekhela Steel-Alexandria	29
El Ezz Steel	30
Company name	*Rank 2009*
Commercial International Bank (Egypt)	1
Orascom Construction Industries (OCI)	2
Egyptian Transport (EGYTRANS)	3
Telecom Egypt	4
Raya Holding For Technology & Communications	5
El Ezz Steel	6
T M G Holding	7
Orascom Telecom Holding (OT)	8
Egyptian Financial Group-Hermes Holding Company	9
Lecico Egypt	10
Sidi Kerir Petrochemicals	11
EL Ezz Aldekhela Steel-Alexandria	12
Heliopolis Housing	13
Oriental Weavers	14
Housing & Development Bank	15
Egyptian Company for Mobile Services (Mobinil)	16
Olympic Group Financial Investments	17
GB AUTO	18
Egyptian Kuwaiti Holding	19
Mena Touristic & Real Estate Investment	20
Alexandria Mineral Oils Company	21
Six of October Development & Investment (SODIC)	22
Medinet Nasr Housing	23
National Development Bank	24
Naeem Holding	25
United Arab Shipping	26
B-Tech	27
Misr Chemical Industries	28
Nile Matches	29
Credit Agricole Egypt	30
Company name	*Rank 2010*
Egyptian Company for Mobile Services (Mobinil)	1
Orascom Construction Industries (OCI)	2
Egyptian Transport (EGYTRANS)	3

(*continued*)

Table AI.

Table AI.

Egyptian Corporate Responsibility Index "S&P/EGX ESG Index"	
Telecom Egypt	4
Commercial International Bank (Egypt)	5
Lecico Egypt	6
T M G Holding	7
Orascom Telecom Holding (OT)	8
El Ezz Steel Rebars	9
Raya Holding For Technology And Communications	10
Egyptian Financial Group-Hermes Holding Company	11
GB AUTO	12
Heliopolis Housing	13
ELSewedy Cables	14
Sidi Kerir Petrochemicals	15
Housing & Development Bank	16
Egyptian Kuwaiti Holding	17
Egyptians Abroad for Investment & Development	18
B-Tech	19
Misr Chemical Industries	20
El Ahli Investment and Development	21
South Cairo & Giza Mills & Bakeries	22
El Ahram Co. for Printing and Packing	23
Six of October Development & Investment (SODIC)	24
Gharbia Islamic Housing Development	25
Delta Construction & Rebuilding	26
Palm Hills Development Company	27
Medinet Nasr Housing	28
Naeem Holding	29
Egyptian Iron & Steel	30

Appendix 2. The financial ratios utilized in this study

Financial ratios[9]

Solvency, or liquidity, ratios:

(1) Cash/current assets

(2) Inventory/current assets

(3) Accounts receivables/current assets

(4) Quick ratio

(5) Current ratio

(6) Current liabilities/net worth

(7) Current liabilities/inventory

(8) Total liabilities/net worth

(9) Fixed assets/net worth

(10) Cash ratio

(11) Net working capital/total assets

(12) Interval measure

(13) (Cash + receivables)/expenditure for operations

Assets efficiency ratios

(14) Total assets turnover
(15) Fixed assets turnover
(16) Inventory turnover on sales
(17) Inventory turnover on CGS
(18) Inventory ratio
(19) Days in period/inventory turnover
(20) Accounts receivables turnover
(21) Accounts payables turnover
(22) Common equity turnover (efficiency measure)
(23) Day's sales in inventory
(24) Day's sales in accounts receivables
(25) Day's purchases in accounts payables
(26) Collection period
(27) Total assets/net sales
(28) Working capital/net sales
(29) Net working capital turnover
(30) Working capital/cash flow
(31) Accounts payables/annual net sales
(32) Net worth/fixed assets
(33) Sales/net worth
(34) Assets annual growth
(35) Sales annual growth
(36) Net worth/total assets

Expense control

(37) Gross profit margin
(38) Operating profit margin
(39) Net profit margin
(40) Cost of sales/net sales
(41) (Operating expense + cost of sales)/net sales
(42) Operating expenses/gross margin
(43) Operating expenses/total assets
(44) Ratio of investment to earnings
(45) Ratio of operating leverage

Debt levels and capacity or leverage ratios

(46) Financial leverage = debt/assets

(47) Financial leverage = debt/equity

(48) Total debt/working capital

(49) Current liabilities/working capital

(50) Assets/equity

(51) Short-term debt/total debt

(52) Financial leverage = times interest earned

(53) EBIT/fixed charges

(54) Financial leverage = times interest covered by cash flow

(55) Coverage of fixed obligations

(56) (Net income + interest)/interest

(57) Equity multiplier

(58) Net worth/total debt

(59) Net worth/long-term debt

(60) (Total liability/net worth)

(61) Long-term debt/total assets

(62) Long-term debt/net worth

(63) Market value of common stock/long-term debt

(64) Fixed assets/total assets

Profitability ratios

(65) Gross profits/total assets

(66) Return on net worth

(67) Net operating profits/total assets

(68) Return on assets

(69) Book value per share (BVPS)

(70) Earnings per share (EPS)

(71) Earnings annual growth

(72) Earnings yield

(73) Cash flow per share (CFPS)

(74) Cash flow/long-term debt

(75) Price-book ratio (P/B)

(76) Price-earnings ratio (PE)

(77) Price-cash flow ratio (P/CF)

(78) Tax burden = net profit/pretax profit

(79) Interest burden = pretax profit/EBIT = (EBIT – interest expense)/EBIT

(80) Margin = EBIT/sales
(81) Market value added
(82) Retained earnings per share/EPS
(83) Net income/earnings before taxes
(84) Annual growth of EBIT per share
(85) Retained earnings/total assets
(86) Retention ratio
(87) Market price percentage change (stock return)
(88) Net income percentage change

Dividend information

(89) Dividend payout ratio
(90) Dividend yield

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