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Title page

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Voluntary disclosure and risk in an emerging market

Purpose: This paper examines the association between corporate voluntary disclosure and systematic risk (measured by market beta) for a sample of Egyptian listed companies.

Methodology: Using panel data analysis, beta estimates are regressed on voluntary disclosure level and the following control variables: dividend payout, asset growth, gearing, company size and book-to-market ratio.

Findings: The results generally show a negative relationship between voluntary disclosure level and estimated betas, consistent with predictions of the differential information model and theories on the economic consequences of increased disclosure. However, the results are dependent on model specification and the proxy used to estimate beta. This suggests a need for caution and further research on the link between risk and voluntary disclosure in the context of emerging markets.

Practical implications: The main implication of these results is that more voluntary information about listed companies is preferable to less. This should act as an incentive for listed companies to enhance public disclosure.

Originality: This is one of the first studies to explore the economic consequences of increased disclosure in an emerging capital market. The methodology is based on panel data analysis, a technique seldom used in the accounting literature. Another distinctive feature of this paper is that market betas are estimated using several measures in order to obtain greater confidence in the overall conclusions.

Keywords: voluntary disclosure; risk; emerging market; Egypt.

Paper Type: Research Paper

1. Introduction

Prior studies provide evidence that corporate financial reports convey useful accounting information for risk assessment (see for example, Beaver *et al*., 1970; Mear and Firth, 1988; Capstaff, 1991; 1992; Brimble and Hodgson, 2007). If so, then more accounting information would be preferable to less. In this context, the current study examines the hypothesis that securities for which there is a dearth of information are perceived as relatively risky because of the greater uncertainty surrounding their valuation. Specifically, it investigates the association between the level of disclosure and systematic risk (measured by market beta) for Egyptian listed companies. To date, very few studies have examined this topic in general and in the context of emerging markets in particular. The current investigation aims to fill this gap.

Recent theoretical models on the economic consequences of increased disclosure support the findings from differential information models; these suggest that a security for which there is relatively little information available is perceived to have higher systematic risk because of the greater uncertainty surrounding the estimation of their valuation. The true parameters of the security's future cash flows or returns are unknown, and so investors must predict these variables using whatever (mostly historical) information is available. This prediction process is always subject to uncertainty. The presence of such uncertainty when estimating the required information for valuing a security is referred to as "estimation risk" (Shanken and Lewellen, 2000). Part of this uncertainty is due to the differential information available on alternative securities. Barry and Brown (1985) conclude that estimation risk by itself does not affect systematic risk if levels of information are the same across securities (symmetric information). However, if varying levels of information are disclosed about different securities, evidence suggests that investors consistently prefer securities about which more information is available, other things being equal (see for example: Klein and Bawa, 1976; Chen and Brown,1983; Handa and Linn, 1993; Coles *et al*., 1995 ; Shanken and Lewellen, 2000).

Another perspective on this topic is provided by finance theory, which proposes that additional public information will increase a share's liquidity by reducing its bid-ask spread and/or increasing its demand among investors (e.g. Amihud and Mendelson, 1986; 2000; Merton, 1987). According to this theory, if a security's liquidity increases, the rate of return required by investors will decrease and hence the firm's cost of equity capital will fall (e.g. Diamond and Verrecchia, 1991; Botosan, 2000). Within the framework of the capital asset pricing model (CAPM) a firm's cost of capital is entirely driven by beta, so a reduction in the required rate of return should be associated with a fall in beta (Lambert *et al*., 2007). Thus a theoretical explanation for an association between a firm's systematic risk and its level of disclosure exists. However, this has rarely been examined in general and for developing markets in particular.

The practical importance of this study arises from its assessment of the advantages of increased disclosure for individual investors, companies, standard setters and regulators. Increased disclosure can benefit individual investors when planning their investment choices by reducing uncertainty surrounding the process of estimating security returns. This in turn will reduce the rate of return required by investors for holding a company's shares, and hence reduce the firm's cost of equity capital and increase its value. For standard setters and regulators, demonstrating a negative relationship between the level of disclosure and a firm's cost of equity capital provides a justification for the need for more information disclosure. Moreover, this research could act as a catalyst for the study of similar markets, thereby adding to the accounting literature in emerging capital markets.

The rest of this paper is organised as follows. Section 2 reviews the literature while Section 3 provides an overview of Egypt's Stock Exchange. Section 4 presents the research model, outlines the data collection process and describes the information sources used; the empirical proxies used for disclosure level and beta in the current investigation are also explained in this section. Section 5 discusses the multiple regression model used in this research and the estimation results. Finally, the research conclusions and suggestions for future research are outlined in section 6.

2. Literature review

Graham *et al*. (2005) investigated the motivations for corporate voluntary disclosure of information by surveying a large number of US financial executives. The results indicated that more than 80 per cent of respondents agreed or strongly agreed that firms use voluntary disclosure to reduce the information asymmetry between managers and outsiders. Moreover, a sizeable number of interviewees agreed that the most important motivation for making voluntary disclosures is to reduce uncertainty about the firms' prospects.

However, a review of the relevant literature shows that empirical research has concentrated either on investigating the link between disclosure level and stock liquidity (e.g. Healy *et al*., 1999; Leuz and Verrecchia, 2000), or testing the link between disclosure level and an overall proxy for the cost of equity capital (e.g. Hail 2002; Botosan and Plumlee, 2002). Little direct empirical evidence exists with respect to the association between disclosure level and beta. The small number of studies that examined the association between corporate disclosure levels and equity risk have tended to focus on developed countries such as the US (e.g. Singhvi and Desai, 1971; Garsombke, 1979; Dhaliwal *et al*., 1979, Clarkson and Thompson, 1990), the UK (e.g. Firth, 1984) and Australia (e.g. Clarkson and Satterly, 1997). In addition, the few empirical studies that have been conducted in this area have achieved mixed results. For example, Garsombke (1979), Dhaliwal et al. (1979) and Firth (1984) showed that disclosure was an insignificant variable in explaining company risk. Other studies such as Clarkson and Thompson (1990), Coles *et al*. (1995), Clarkson *et al*. (1996) and Clarkson and Satterly (1997) suggested a negative association between the amount of information available about a security and its estimated market beta. More recently, Lam and Du (2004) examined the relationship between both voluntary and mandatory disclosures and two measures of a security's risk in the Chinese market: market beta and the variance of returns. They found preliminary evidence that firms which complied more fully with mandatory disclosure requirements tended to have a lower market beta. However, their results from regression analysis did not support the existence of a relationship between market beta and any measure of disclosure. They concluded that these results were difficult to generalise to other markets because of data problems encountered.

The relative scarcity of empirical studies on the relationship between disclosure level and beta could be due to a number of factors. First, investigating the potential benefits of increased disclosure is not an easy practical task due to the measurement difficulties associated with both disclosure and its benefits. Disclosure is a theoretical concept that is difficult to measure directly (Cooke and Wallace, 1989), and the size of any benefits from greater disclosure may be too small to observe and test empirically (Botosan 2000; Amihud and Mendelson, 2000). Second, there is a difficulty in linking disclosure to the cost of capital, since there is no generally accepted model of the cost of capital that incorporates disclosure policy (Lang, 1999). Within the framework of the traditional CAPM, for example, information need not be explicitly considered since it is already incorporated in asset prices. According to this view, information has a limited role in the traditional CAPM. However, Easley *et al*. (2002: 2186) argue that this view is static rather than dynamic, and remark that 'If asset prices are continually revised to reflect new information then efficiency is a process, and how asset prices become efficient cannot be separated from asset returns at any point in time'. In other words, if asset pricing is a dynamic process, then asset prices will be updated with each new piece of information reaching the market. Third, as Hail (2002: 755) stated: 'every empirical test involving beta could also be treated as a test of its theoretical underpinnings. If the basic assumptions of the CAPM do not hold because of market size or market structure, the resulting beta will be biased [1]'. Finally, prior studies tend to focus on companies listed on developed capital markets, mainly in the US. This focus reflects the availability of high quality data as well as a greater acceptance that developed markets are efficient, so that prices reflect all available information. Hence, studying the effect of information disclosure on prices in less efficient or inefficient markets is often seen as problematic [2].

In summary, theory suggests that in the presence of information asymmetry between management and outside investors, securities for which there is relatively little information will be perceived as more risky in terms of systematic risk. However, the empirical research on this issue is still very limited and has generated mixed results. Hence, a relationship between the level of disclosure and systematic risk (approximated by market beta) is still an empirical issue. This study contributes to the literature by examining the association between voluntary disclosure and beta in an

emerging capital market using panel data. Panel data has advantages over cross-sectional or time series information because it provides more observations, increases the degrees of freedom and reduces the collinearity problem among explanatory variables; thus the efficiency of estimated coefficients is increased. The use of panel data also helps reduce the magnitude of the problem of associated omitted factors that are correlated with the explanatory variables (Hsiao, 1986). Finally, conclusions drawn from the existing empirical literature tend to rely on one set of estimated betas, although estimated betas can vary depending on factors such as data frequency (daily, weekly, monthly returns), measurement period, the market index used, the model specified for estimation, and the estimation technique. It follows that conclusions about the relationship between beta and disclosure level based on a single measure of the estimated beta might be misleading. To overcome this problem, we estimate betas using several alternative approaches. Beta estimates were estimated by using weekly returns over a moving five-year period of time via the pooled generalized least squares market model and three proxies for the market portfolio.

2. Egypt's Stock Exchange and financial reporting

According to the International Finance Corporation (IFC) the Egyptian Stock Exchange (ESE) is considered an emerging market. Trading is concentrated in a small number of securities, where the 30 most heavily transacted equities accounted for 85.8 per cent of total value traded for the period from January to June 2002 (CASE Fact Book, 2002). ESE is seen as relatively free from barriers to entry and exit; there are no legislated restrictions preventing foreign participation in the market and repatriation of income and proceeds from the sale of shares is possible (IFC, 2008).

In Egypt, the annual report is the main vehicle for financial disclosure by listed companies. All companies listed on the Egyptian Stock Exchange (ESE) must comply with the disclosure rules required by the Capital Market Law (CML) 95 of 1992. They are required to provide copies of their annual and semi-annual financial statements to both the Capital Market Authority (CMA) and the ESE. They must also publish a summary of these documents in two daily newspapers, at least one of which must be in Arabic. Mandatory financial disclosures include a balance sheet, an income

statement, a cash flow statement, a statement of changes in equity, the notes to the accounts, a report by the board of directors and a report by the external auditor. In preparing their financial statements, companies are required to comply with Egyptian Accounting Standards (EAS), which are in conformity with the International Accounting Standards (IAS) with some minor exceptions [3]. The CMA reviews financial statements of listed companies and auditors' reports to ensure timely and full compliance with the Egyptian Accounting and Auditing Standards. In the case of non-compliance, the CMA requests the non-compliant company to publish the missing information. If a company fails to comply with this request, the CMA can publish details of the non-compliance. The CMA can also suspend or de-list securities of non-compliant companies.

With respect to non-financial disclosures, some are regulated such as share class voting rights, board remuneration, details of board members and information regarding senior management. However, it is up to the company to decide on the level of detail about these topics that it should reveal to the public. Ethical and environmental disclosures are rare or non-existent (ROSC, 2004).

Although in theory all listed companies are required to disclose information according to EAS/IAS, prior studies on the financial reporting practices of Egyptian listed companies have shown that non-compliance with disclosure requirements is the norm (see, for example, Abd-Elsalam, 1999; PCSU, 2000; Dahawy *et al*., 2002; ROSC, 2002; and Fawzy, 2003). These previous investigations provided some potential explanations for this non-compliance such as: the lack of familiarity with IAS, the deep-rooted tendency for secrecy within Egyptian culture, the lack of an effective enforcement policy for non-compliant companies, the absence of practical guidelines on the applicable standards, and the dearth of knowledge about disclosure requirements among preparers. Moreover, the role of information intermediaries is rather limited. In effect, it is up to the company to decide on the level of information released to the public. Hence, the amount of information, irrespective of its type, released by Egyptian listed companies is expected to differ among firms.

4. Research model and variables

This section outlines the research model used for examining the relationship between companies' voluntary disclosures and market betas. Voluntary disclosure level and a number of control variables suggested from prior studies are regressed on the estimated market betas (see for example, Beaver et al., 1970; Dhaliwal *et al*., 1979; Garsombke, 1979; Firth, 1984). These control variables are dividend payout, asset growth, gearing, company size and book-to-market ratio.

$\hat{\beta}$ = *f* (dividend payout (-), asset growth (-), gearing (+), firm size (+), book-to-market ratio (+), voluntary disclosure (-)). [1]

The remainder of this section describes how these variables are measured, the expected relationship between beta and the control variables, and the data sources. A summary of the variables' measurement is presented in Table (2).

4.1 Beta estimation

Beta is a measure of the relative volatility of returns. In the CAPM, beta is the only variable that affects the firm's cost of capital and hence its estimation must be accurate. In order to estimate a historical beta [4], however, one must make choices concerning the model parameters, including data frequency, measurement period, market proxy, and the market model form (Harrington, 1983). Using different combinations of these parameters can yield different beta estimates. The current literature does not provide a definitive guide as to which parameters should be used.

Daily security prices could yield unreliable beta estimates, since small price changes might yield return values that are equal or close to zero, which will produce insignificant beta coefficients. Moreover, Fama (1970) found that daily security price changes exhibited positive autocorrelation, thereby violating a key assumption for ordinary least squares OLS estimation. In addition, OLS estimates of beta for a cross-section of securities are biased, with the bias being larger for firms with high or low beta estimates (Elgers, 1980, 391). Furthermore, although prior studies do not provide a definitive measurement period, a five-year period of time is usually accepted as an appropriate measurement period (McLaney, 2003).

Consequently beta is estimated [5] using weekly rather than daily prices over a five-year period of time using three [6] different proxies for the market index. Weekly prices are preferred to monthly prices in order to incorporate as many observations as possible, hopefully improving the reliability of the results. Mid-week prices (Tuesday prices) are used to avoid any abnormal patterns in share returns associated with the beginning or the end of the week (see for example, Berument and Kiymaz, 2001; Apolinario *et al*., 2006; Lee and Hung, 2008). The criterion applied here is the availability of at least 100 observations over a moving five-year period of time (1995-1999, 1996-2000, 1997-2001 and 1998-2002). Since stock returns are obtained for the same start and end dates, it was decided to organise the observations (returns across shares and time) in the form of panel data. The method of estimation employed was the pooled generalised least squares GLS market model using the seemingly unrelated regression (SUR) option [7]. This particular model corrects for both heteroskedasticity and contemporaneous correlation, and thus yields more robust estimates. Moreover, betas that were only significant at the 10% level of significance or lower were identified and used in the subsequent analysis to ensure greater reliability in the beta values. Three proxies for beta have been created depending on the proxy of the index of the market used, i.e. Beta (case30-weekly), Beta (total-weekly) and Beta (traded-weekly).

4.2 Voluntary disclosure level

The extent of voluntary disclosure for Egyptian non-financial listed companies was measured by means of a disclosure index technique. We examined the existence of 26 items of information in companies' annual reports. These items of information were drawn from the guidelines manuals of disclosure and transparency requirements published by the CMA as well as from the checklist used by the Center for International Financial Analysis and Research (1995). Assuming that low compliance with mandatory disclosure can be treated as voluntary disclosure (Firth, 1979; 1984) because more discretion is believed to be exercised over disclosing these items of information, mandatory items of information drawn from the checklist for the disclosure requirements of the CMA [8] that showed volatility over time were

considered as voluntary disclosure items. Each item was equally weighted by giving the item of information the value of one if disclosed and the value of zero if not. The total disclosure index was then measured as the sum of scores awarded to a particular company in a particular year divided by the maximum number of applicable items (in order not to penalise companies for non disclosure of non-applicable [9] items of information). Once this disclosure index was created, it was necessary to assess whether it was a relatively reliable proxy for the extent of disclosure in order to draw useful inferences from the analysis. We therefore tested for the reliability of the disclosure index employed in this research using the commonly used measure for internal consistency, namely Cronbach's alpha [10]. The obtained alpha coefficient value was 0.77 which is close to the theoretical range of 0.80 and higher than the value of 0.64 obtained by Botosan (1997). Hence the results support the reliability of the disclosure index used in the current study as a measure of corporate voluntary disclosure level.

4.3 Control variables

Beaver et al. (1970) introduced a number of accounting measures which appeared to be related to market risk: dividend payout, current ratio, asset size, asset growth, gearing, earnings variability and earnings covariability. These variables have been used in prior studies that sought to use financial statement data to predict equity risk with mixed results (see, for example, Bildersee, 1975; Belkaoui, 1978; Farrelly *et al*., 1985; Capstaff, 1991; 1992). Although this list of variables might not be inclusive, they were described as "being traditionally and most frequently associated with risk" (Capstaff, 1992: 223). So this research employed a similar list as control variables when examining the association between voluntary disclosure and equity risk, except where data were not available. In addition, we tended to use two market based measures: the market value of equity and book-to-market ratio. Thus our list of control variables in the current study include: dividend payout, asset growth, gearing, firm size and book-to-market ratio.

Dividend payout [11] could have a positive or a negative relationship with risk. If we assume that companies tend to adopt a stable dividend policy (Linter, 1956), then companies that exhibit greater uncertainty about their expected earnings will pay out a lower percentage of their earnings. Hence, dividend payout should have a negative

relationship with beta. Alternatively, if companies with lower payout ratios retain more cash within their businesses and are relatively more liquid, one might hypothesise that the relationship between the payout ratio and systematic risk is positive. In fact, although some prior studies (e.g., Bildersee, 1975) have found that the relationship between the payout ratio and beta was uncertain, others have reported that the relationship is negative (Beaver *et al*., 1970). Overall, we expect a tendency towards a negative relationship. In the current study, the payout ratio is measured as the moving average of total dividends divided by the moving average of net income.

Myers and Turnbull (1977) argued that when growth is defined as a non-stochastic expansion rate it is negatively related to beta, and when defined as extra profitable opportunities (future investment) it should have a positive effect on risk. We use percentage changes in assets as a proxy for growth. It is measured as ln(moving average of total assets/moving average of total assets (-1)). In the Egyptian context we expect a negative rather than a positive association between market beta and growth. This is because the market tends to be dominated by individual investors (at least for the time period covered by this research), who are generally not finance professionals and who place a strong reliance on profitability as an indicator of the overall "health" of a company.

Gearing is a measure of the risk that the company faces when it uses debt as a source of finance. When debt forms part of the capital structure, a company commits to meet certain obligations (interest charges) irrespective of its realized profits. These fixed obligations increase the sensitivity of the earnings available for shareholders to any changes in the operating profits of the company. Consequently a positive association between the gearing ratio and risk is expected. Gearing is measured as the moving average of long-term debt divided by the moving average of book value of equity at year-end.

Prior studies conducted mainly in the US expect a negative association between size and beta, since small firms are thought to be riskier than their larger counterparts. Larger firms often have less volatile earnings because they produce a portfolio of products which are sold in many countries (Beaver *et al*., 1970). However, in their

study on risk in five emerging capital markets including Egypt, Girard and Omran (2007, 121) concluded that: "we add to a growing literature base suggesting that, in markets other than the US, it is possible to find large and growth stocks to be riskier than small and value stocks". Hence a positive association between size and beta might not be unexpected in the Egyptian market. We use a market-based measure of size, which should be more appropriate than the book value of total assets in capturing this association. This measure is the natural logarithm of the moving average of market value of equity over five years period of time.

The book-to-market ratio is included as our final control variable. Fama and French (1992) found that the logarithm of the book-to-market ratio is more powerful in terms of the magnitude and the significance of the relationship than the logarithm of market value of equity in explaining average returns. Moreover, Berk (1995:284) stated that: "The logarithm of the ratio of book equity to market equity is, in principle, a better measure of the continuously compounded expected return than is the logarithm of market equity alone". Hence, this research uses the book to market ratio as a proxy for market leverage. It is measured as the book value of equity to the market value of equity at the financial year end. We expect a positive association between beta and this book to market ratio.

In summary, to estimate the hypothesised research model beta estimates are regressed on the disclosure level and the control variables. The method of estimation is the pooled GLS with White heteroskedasticity-consistent standard errors and covariance.

4.4 Data collection and sources

This section describes the collection process and sources for the data used in this research. The aim was to collect a complete series of annual reports in their original format for non-financial companies over the period 1995 to 2002. The first criterion employed when selecting the sample was that the annual reports of the companies should be available. Because this research explores whether public companies can gain from their disclosure policy in terms of a lower cost of equity capital, thus a second criterion was that closed companies (family or rarely traded companies) had to be excluded from the sample. The third criterion was that only the annual reports of

non-financial listed companies were to be used. Financial services companies such as banks and insurance companies were excluded because of their specific financial characteristics, which affect the information that they disclose. The CMA in Egypt proved to be the most suitable source for the information required. The electronic archive department, which is part of the CMA's information centre was visited and scans of the original reports of listed companies obtained.

The final sample consists of 80 listed non-financial companies from 13 different industrial sectors over the period 1995 to 2002. This figure was arrived at after a number of refinements to the original sample [12] due to changes in legal status, ownership and availability of data. The number of observations per company ranges from one to eight over the period 1995 to 2002, giving a total of 272 panel data observations in the final sample. Table (1) provides a summary of the number of observations in the final sample per financial year-end, and the number of observations sorted by company legal form and industry sector. It shows that a quarter of the sample firms come from the Building, Materials and Construction sector. This is not surprising since more than 50 per cent of ESE total market capitalization in June 2002 derived from only three sectors: utilities, building materials and construction, and financial services.

Finally, the sample consists of firms with different fiscal year-ends, namely firms with June fiscal year-ends (206 observations) and firms with December fiscal year-ends (66 observations).

5. Results

5.1 Descriptive statistics

Table (3) provides descriptive statistics for all variables used in the research model. An inspection of this table reveals that the typical firm in the sample had a relatively small range of betas varying from 0.526 to 1.347 depending on the index used. It paid out 69 per cent of its earnings as dividends, had an asset growth rate of less than 2 per cent and a gearing ratio of 25 per cent. The mean disclosure level was 0.540 which suggests that voluntary disclosure by listed companies was limited.

<insert table (3) here>

These average figures mask a range of values among the sample firms. Indeed, an analysis of Table (3) shows sizeable differences between the minimum and maximum values. For example, the disclosure index values ranged from a low of zero to a high of 0.840. The beta values also varied considerably among the sample firms with the maximum number recorded of 3.933; some of the companies studied in the current paper were very risky according to this measure. The final two columns of Table (3) suggest that the data are not normally distributed as most of the skewness and kurtosis measures were statistically significant at the 5 per cent level [13].

5.2 Correlation results

The normality hypothesis is rejected for almost all the variables, so a nonparametric correlation test is used to calculate the correlation coefficients. The results for the correlations between voluntary disclosure level and betas as well as the other explanatory variables are presented in Table (4).

<insert table (4) here>

The correlation between voluntary disclosure level and any proxy for estimated beta is negative but not significant. These results are consistent with those obtained recently from the UK market concerning the association between risk and disclosure, using seven proxies for company level risk by Linsley and Shrives (2006). They found no association between risk disclosure and five out of seven measures of risk: the gearing ratio, asset cover, quiscore, the book-to-market value of equity and the beta factor. However to reach a firm conclusion one should consider other explanatory variables that are omitted from the current analysis (the control variables in a multiple regression model). Estimated betas are highly correlated with each other. This might mean that the different proxies used for the market index might not significantly capture different aspects of the market.

Because significant correlations do exist among the explanatory variables, we check for potential collinearity among the explanatory variables. The tolerance coefficients are computed for each explanatory variable in the multiple regression model. The

lowest tolerance coefficient is 0.907, implying that collinearity is not a problem in this model.

5.3 Multiple regression results

The multiple regression model is estimated using pooled GLS with White heteroskedasticity-consistent standard errors and covariance. Table (5) shows the results of the model estimation where beta is the dependent variable.

<insert table (5) here>

The association between beta estimations and the explanatory variables are generally in the expected direction and highly significant with the exception of the payout ratio. The relationship between beta and payout is either positive or negative but not significant. A notable feature of the estimation results is that the coefficient of the size variable is positive (as expected) and highly significant which is consistent with the findings of Brimble and Hodgson (2007) for Australian data. By contrast, Bildersee (1975), Farrelly *et al*. (1985) and Capstaff (1991; 1992) found no association between beta and asset size. Beaver et al. (1970) also found no association between beta and asset size in their regression equation, and eventually excluded it along with other variables (gearing and liquidity) from their analysis, because including it caused the standard error to increase. Our results are more consistent with Girard and Omran's (2007) findings for five emerging markets (including Egypt), namely that large, fast growing firms tend to be riskier than their smaller and low-growth counterparts. Within the context of the Egyptian market, one possible explanation for these results is that size might be a surrogate for financial gearing, since a significant positive correlation between size and gearing is documented at the 1% level of significance in Table (4). Moreover, size could proxy for operating gearing, since a significant positive correlation between size and the ratio of fixed assets to total book value of assets is also discovered at the 1% level of significance (results not presented here). Large companies might have a higher proportion of fixed costs (for example maintenance expenses) that must be paid irrespective of their level of sales, which in turn causes returns to shareholders to be sensitive to changes in companies' level of sales.

The results [14] generally show a negative association between beta estimates and voluntary disclosure consistent with (a) theoretical models on the economic consequences of increased disclosure and (b) findings from differential information models. This result reinforces the intuition that more information reduces uncertainty surrounding the valuation of securities and hence lowers risk. This association was highly significant with beta using the case 30-weekly index but less significant with beta based on the total-weekly index. In addition, the results also show a negative but not significant association between beta (traded-weekly) and voluntary disclosure. The inconsistency of the results obtained for the relationship between voluntary disclosure level and market beta could be due to problems inherent in the specific market index used. Specifically, the case 30-weekly index is value weighted and adjusted for the fact that many Egyptian listed companies are closely held. Also, the model where beta is calculated using this index has the highest R^2 (0.845); the other two models where different market indices are employed have lower R^2 statistics.

Finally, the multiple regression models were re-estimated using the smaller sample of firms which consists of 66 observations from firms with December fiscal year-end (Fama and French, 1992). The results (not reported here) show negative relationships between disclosure level and estimated betas using the case30 index as a proxy for the market. However, only firm size could be included as a control variable, since the inclusion of more than one control variable led to a significant reduction in the number of observations, thereby preventing further testing.

6. Concluding remarks

This study tests the hypothesis that securities for which there is relatively little voluntary disclosure information are perceived as more risky in terms of systematic risk. Our results provide some empirical evidence to support this view, since a significant negative association between beta estimation and the level of voluntary disclosure is generally obtained. However, we should emphasise that the estimation of beta is sensitive to the choice of parameters such as data frequency, measurement period, the proxy of the market, and the form of the market model used for estimation. The use of panel data generally provides a larger number of observations, but there

were fewer observations than desirable in our sample. Given the lack of empirical studies regarding the implications of disclosure level for beta in general and in emerging markets in particular, further research seems necessary before a more definitive conclusion can be reached.

Future research could replicate our analysis for different information environments using alternative measures of risk. Iqbal and Brooks (2007) suggest that total risk might be a more appropriate variable to study in emerging markets where investors may not be fully diversified. Other proxies for disclosure level could be used, such as interim reports information and investor relations details. Finally, a comparative study among different economies with different qualities of accounting standards would provide another fruitful area of research.

Table (1)

Panel A: Number of observations in the final sample sorted by financial year-end

	1995	1996	1997	1998	1999	2000	2001	2002	Sum
December	2	3	2	9	14	14	22	0	66
June	7	19	36	40	35	26	21	22	206
Sum	9	22	38	49	49	40	43	22	272

Panel B: Number of observations in the final sample sorted by companies' legal form

	1995	1996	1997	1998	1999	2000	2001	2002	Sum
Private	2	4	18	29	31	27	30	9	150
Public	7	18	20	20	18	13	13	13	122
Sum	9	22	38	49	49	40	43	22	272

Panel C: Final sample companies by industry sector

Industry sector	N
Electrical Equipment and Engineering	3
Housing and Real Estate	7
Food and Beverage	7
Agriculture and Fishing	3
Consumer and Household Goods	2
Health and Pharmaceuticals	9
Chemicals	9
Mills and Storage	8
Textiles and Clothing	7
Entertainment	2
Building Materials and Construction	20
Retailers	1
Paper, Packaging and Plastics	2
Total	80

N: number of companies in each sector

Table (2) Variables' measurement

Variable name	Measurement over five-year
Market beta	The pooled GLS market model based on weekly returns. Three proxies for beta have been created depending on the proxy of the index of the market used, i.e. Beta (case30-weekly), Beta (total-weekly) and Beta (traded-weekly).
Payout	The moving average of total dividends divided by the moving average of net income.
Asset growth	ln(moving average of total assets/moving average of total assets (-1)).
Gearing	The moving average of long-term debt divided by the moving average of book value of equity at year-end.
Firm size	The natural logarithm of the moving average of market value of equity for five years
BTMR	Book value of equity at the financial year end divided by market value of equity at the financial year end.
Disclosure	Level of voluntary disclosure measured via the disclosure index technique.

Table (3) Descriptive analysis of variables

	Mean	Median	Maximum	Minimum	Skewness	Kurtosis
Payout	0.698	0.687	7.221	-1.127	6.633	53.913
Growth	0.018	0.005	0.335	-0.293	0.612	6.893
Gearing	0.250	0.107	1.304	0.000	1.290	3.918
Size	19.188	19.042	21.844	17.004	0.357	2.190
BTMR	1.460	1.034	10.613	0.271	3.937	20.087
Disclosure	0.540	0.560	0.840	0.000	-0.794	3.371
Beta (case30-weekly)	0.526	0.532	1.201	0.162	0.600	3.967
Beta(total-weekly)	1.347	1.330	3.933	0.487	2.109	13.009
Beta(traded-weekly)	0.738	0.728	2.479	0.241	2.552	16.585

Table (4) Spearman cross-product correlation matrix

	Payout	Growth	Gearing	Size	BTMR	Disclosure	Beta (case30-weekly)	Beta (total-weekly)
Growth	-0.150*							
	0.017							
Gearing	-0.292**	0.053						
	0.000	0.373						
Size	-0.016	0.165**	0.137**					
	0.780	0.005	0.010					
BTMR	-0.063	-0.135	0.032	-0.526**				
	0.392	0.102	0.653	0.000				
Disclosure	0.138	0.097	0.028	0.132	0.057			
	0.060	0.241	0.689	0.060	0.350			
Beta (case30-weekly)	-0.329**	-0.098	0.400**	0.030	0.283**	-0.111		
	0.001	0.310	0.000	0.756	0.012	0.333		
Beta (total-weekly)	-0.289**	-0.200*	0.333**	-0.019	0.248**	-0.065	0.803**	
	0.000	0.012	0.000	0.817	0.007	0.489	0.000	
Beta (traded- weekly)	-0.286**	-0.245**	0.338**	-0.079	0.246**	-0.087	0.830**	0.954**
	0.000	0.002	0.000	0.329	0.009	0.362	0.000	0.000

Numbers in parentheses are probabilities of significance. **Correlation is significant at the 1% level (2-tailed); *Correlation is significant at the 5% level.

Table (5) Regression results - Dependent variable: estimated betas

	Beta (case30-weekly)	Beta (traded- weekly)	Beta (total-weekly)
Constant	-0.321**	-0.109	-0.721**
	(-0.010)	(0.548)	(0.004)
Payout (-)	0.004	-0.037	-0.044
	(0.855)	(0.182)	(0.417)
Growth (-)	-0.233**	-0.590**	-1.333**
	(0.005)	(0.000)	(0.000)
Gearing (+)	0.171**	0.100**	0.084
	(0.000)	(0.000)	(0.102)
Size (+)	0.043**	0.040**	0.104**
	(0.000)	(0.000)	(0.000)
Book-to-market ratio (+)	0.041**	0.054**	0.092**
	(0.000)	(0.000)	(0.000)
Disclosure (-)	-0.146**	-0.032	-0.192
	(0.000)	(0.480)	(0.077)
Total pool observations	73	104	108
R-squared	0.858	0.577	0.468
Adjusted R-squared	0.845	0.551	0.436
S.E. of regression	0.194	0.293	0.480
F-statistic	66.601	22.026	14.785
Prob.(F-statistic)	0	0	0

Notes: t-values in parentheses. White heteroskedasticity-consistent standard errors and covariance, and GLS (cross-section weights). ** Significant at 1% level (2-tailed); * Significant at 5 % level .

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Appendix: List of items of information included in the disclosure indices.

- Address, telephone, fax.
- The currency used for the preparation of financial statements.
- List of board members.
- Number of employees.
- Business segment.
- Foreign exchange gains or losses.
- Effect of transactions with related parties: holding, subsidiary, and associated companies
- Items and values of intangible assets.
- Restrictions on ownership of assets.
- Disclosing the necessary reconciliation of net income when the indirect method is used.
- Cash flow related to interests, dividends, and extraordinary items disclosed separately.
- Cash outflow for taxes.
- Financial statements cost basis.
- Taxation.
- Foreign currency transaction method.
- Foreign currency transaction gains or losses.
- Treatment of investments.
- Revenue recognition basis
- Earnings per share
- Total dividends.
- Dividends per share.
- Composition of shareholdings.
- Significant shareholders.
- Earning per share numerator.
- Earnings per share denominator.
- Exports.
- Financial ratios disclosed.

[1] This view might arise from the use of the market model in estimating beta, which is very similar to the CAPM. However, Harrington (1983: 71) states that: 'because the market model and the CAPM look remarkably alike, many people presume that they are the same. They are not. The market model does not rely on any of the assumptions inherent in the CAPM. It simply states that the returns-generating process is a linear relationship between the returns from the asset and the returns from the market.

[2] Lee (2001: 237) observes that 'market efficiency is a journey, not a destination. Therefore, the pertinent questions on the matter of market efficiency are not yes or no, because strictly speaking the answer is always no. Price discovery is an on-going process and the current price of a security is best regarded as a noisy (or incomplete) proxy for a security's true fundamental value'. Our study allows for this on-going process by estimating beta based on share prices over the six months after publication of the annual reports, since this period is believed to best capture changes in share prices in response to the revealed accounting information.

[3] For example, one exception according to ROSC (2002: 11) concerns leasing. All finance leases are treated as operating leases in Egypt although this conflicts with IAS 17; local standards allow this practice because it satisfies legal requirements regarding leasing.

[4] To estimate the beta coefficient for each firm for each time period, market returns and stock returns are computed using the following equations:

$M_{rt} = (M_t - M_{t-1})/ M_{t-1}$ and $R_{jt} = (P_{jt} - P_{j(t-1)})/ P_{j(t-1)}$

Where

M_{rt} : market return at time t,

M_t : market index at time t,

R_{jt} : stock j return at time t

P_{jt} : closing price of stock j at time t

[5] Beta estimates were initially obtained with daily returns over the six months after the financial year-ends for the sample firms using the traditional ordinary least squares market model and two proxies for the market.

[6] Three different proxies for the market index were used to estimate beta: the total market index, the public offering companies' index and case30. The total market index includes all listed companies regardless whether the company is publically traded one or not. Recently, the Cairo and Alexandria Stock Exchanges issued a new market index called 'case 30', which is weighted by market capitalization adjusted by the free float[6] (minimum 10%) and includes the top 30 companies in terms of liquidity and activity. Its starting date was January 1st 1998 with a value of 1000 on that day. It is possible that this index provides a better proxy for the market.

[7] Specifically, SUR-GLS using an estimated cross-section residual covariance matrix.

[8] This list is based on Guidelines Manuals that inform companies issuing financial securities and their auditors of the procedures followed by the CMA when ensuring that companies have complied with disclosure and transparency requirements according to the EAS and the IAS.

[9] In order to decide whether a particular item of information, for example exports, was applicable for a particular company in a particular year or not, the entire annual report was read to understand the nature of each company's operations and its circumstances.

[10] Cronbach's alpha is a measure of inter-item correlation. It reflects the homogeneity among a number of items grouped together to form a particular scale. It shows how well the different items complement each other in their measurement of different aspects of the same variable (Litwin, 1995: 24). It can take a value from zero to one.

The higher the coefficient alpha obtained, the higher the reliability of the scale. It takes the maximum value of one when the correlation between each pair of items is one. As a general rule, an alpha of 0.8 for widely used scales is believed to indicate that the correlations are attenuated very little by random measurement error (Carmines and Zellner, 1991).

[11] There are two potential problems associated with the ratio used to measure dividend payout. If the company does not realize any profits (earnings equal to or close to zero) the ratio becomes extremely large, and if the company makes a loss the ratio becomes negative. For the sample firms in this study, however, companies with zero or negative earnings (losses) did not pay dividends, so these problems do not arise.

[12] There were originally 66 non-financial listed companies about which information was available. These 66 companies consist of 33 public business sector companies, which had obtained a listing on the road to privatisation and 33 privately owned listed companies. However, 12 of the 33 public business sector companies were privatised and changed their legal form from public business sector to private sector companies during the time period being studied. In addition, two private sector companies were merged with other companies. It was decided to treat these 14 companies as new companies once the changes had taken place, thereby avoiding any overlap of data from prior periods. This procedure yielded 80 cross-sections.

[13] It is worth noting that this specification of the model limits the analysis to heavily traded shares (average trading days 90%) with a minimum trading volume of 4780 (2595) shares during the six months after (before) revealing the annual reports.

[14] The results (not tabulated here) for an association between beta estimations measured using daily returns and voluntary disclosure show positive but not significant results. The inconsistency of the results obtained for the relationship between voluntary disclosure level and market beta could be due to measurement problems inherent in estimating beta using daily returns over a six month period of time via the OLS market model.