

The Effectiveness of International Financial Reporting Standards Adoption on Cost of Equity Capital: A Vector Error Correction Model

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ABSTRACT

The purpose of this paper was to determine empirically whether adopting the International Financial Reporting Standards by Jordanian companies listed on the Amman Stock Exchange influenced its cost of equity capital over the period 1996-2000 using a Vector Error Correction Model. Expected return, extent of disclosure, financial leverage, and company size used as a proxy for cost of equity capital, disclosure, financial risk, and business risk, respectively. Moreover, Dickey-Fuller and Johansen Cointegration tests were applied. Another tools used were the variance decomposition and Granger Causality tests. Results indicate that none of the independent variables significantly influenced the cost of equity capital.

JEL Classification: G3, G32

Keywords: Cost of equity capital; Disclosure; International financial reporting standards; Financial risk; Business risk

I. INTRODUCTION

There are many reasons for adopting the IFRS. The economic forces of International trade have created the need for a single international standard of financial reporting. International trade is as old as civilization, but until very recently no effort has been made at uniform financial reporting. A single standard would make multinational business much easier. An agreed international standard of reporting would also ease tracking both domestic and international economic growth. Chamisa (2000) demonstrated that growing international trade and investment increased problems produced by different nations using different accounting systems. Studies such as Sharp (1998) and Street et al. (1999) have demonstrated that a) differences in financial accounting measurement and reporting practices do exist; and b) these differences do actually create problems of misunderstandings, inefficiencies, and uncertainties to participants in the global economy (Evans and Taylor, 1982; Arpan and Radebaugh, 1985; Peavey and Webster, 1990; Choi and Levich, 1991; Purvis et al., 1991; Sharp, 1998; Street et al., 1999).

Today many firms wish to list their securities on multiple stock exchanges. This is to obtain exposure to new markets, obtain foreign debt and equity capital for growth and expansion, improving customer recognition, increasing publicity about the firm, having materials and technology and looking to reduce possible political costs (Gary et al., 1995). Prior research concludes that firms competing for foreign resources tend to expand their financial and accounting disclosure (Zarzeski, 1996). This expanded disclosure is assumed to reduce resource providers' uncertainty about transactions with the firm and, in turn enable the firm to obtain resources at lower cost. Improved information reduces uncertainty about a company and therefore, potentially the risk premium required by investors (Demsetz, 1968; Choi, 1973; Copeland and Galai, 1983; Holthausen and Leftwich, 1983; Glosten and Milgrom, 1985; Amihud and Mendelson, 1986; Gary and Gray, 1989; Diamond and Verrecchia, 1991; Gray, 1995; Baiman and Verrecchia, 1996; Verrecchia, 1996; Botosan, 1997; Levitt, 1998; Sengupta, 1998; Barth et al., 1999; Huddart et al., 1999; Botosan and Plumlee, 2000; Brealey and Myers, 2000; Richardson and Welker, 2001). Choi and Levich (1991) argued that diversity in accounting reporting (measurement, presentation, and disclosure) affects capital market participants. In an extensive survey of capital market regulators and rating agencies, almost one-half of the respondents stated that their capital market decisions were affected by accounting diversity. In the absence of common accounting principles and disclosure practices, analyzing foreign financial statements is difficult for investors.

Chamisa (2000) pointed out that the international accounting harmonization objective is important for developing countries because of their significant reliance on inflows of foreign capital to finance economic and industrial developments. This argument is clearly relevant to the Jordanian economy, which is dependent on the international institutions for funding.¹ However, an alternative means of listing on multiple stock exchanges is by producing multiple financial statements to comply with the securities laws and host country GAAP. This however could be a very costly process to the firm and confusing to the financial markets and may lead to sub-optimal resource allocation for both the firm and local markets (Sharp, 1998; Street et al., 1999; El-Gazzar, 1999).

Harmonization of accounting standards at the international level is rapidly gaining momentum due to the growth in capital markets spurred by technological advances in communications and gradual deregulation of national capital markets. The two major players promoting harmonized standard are the International Accounting Standards Board (IASB) and the International Organization of Securities Commission (IOSCO) (Hora 1997).² Sharpe (1998); and Street et al. (1999) argued that the benefits of international accounting standards include the reduction of investment risks and cost of capital worldwide. IOSCO is playing a major role in adopting IFRS globally by encouraging its member stock exchanges to recognize IFRS and by advising the IASB on the probable acceptability of standards (Thorell and Whittington, 1994).

The purpose of this paper is to determine empirically whether adopting the IFRS by JIC's listed on the ASE was influenced its cost of equity capital. To do so, we must control for those constant factors that are always present in an equity market, namely; business risk and financial risk. More specifically this paper examined the dynamic relationship between cost of equity capital (C), extent of disclosure in compliance with IFRS (DIS), financial risk (FR), and business risk (BR) using Vector Error Correction (VEC) model. In Section II presents accounting disclosure in developing countries. Section III the relevance of IFRS for developing countries is outlined. Section IV reviews the empirical literature. Section V highlights the significance of the Study. Research methodology is presented in Section VI. Empirical results are discussed in Section VII. And the conclusion is given in Section VIII.

II. ACCOUNTING DISCLOSURE IN DEVELOPING COUNTRIES

Earlier studies have shown that accounting disclosure requirements and practices do not develop in a vacuum but are shaped by a number of influences (Adhikari and Tondkar, 1992; Choi and Mueller, 1992). Looking at disclosure from the macro perspective, Environment Determinism Theory (EDT) suggests that both national and international environment factors are important factors affecting accounting disclosure in a country. Despite the view that the accounting system in a country should reflect environmental factors inherent in the country (Briston, 1978; Bursal, 1984), there is evidence in the literature which suggests that accounting, including disclosure, in developing countries is likely to be influenced more by external factors (Cooke and Wallace, 1990). Addressing the external environmental or international influence, Wallace (1987) stated that the influences of international agencies on developing countries is so strong that it is almost unbelievable that the literature works on the assumption that these countries are free to choose and determine their accounting systems.

International harmonization/standardization efforts are among the important external environmental factors. One of the primary generators of such efforts is the International Accounting Standards Board (IASB), which has issued a number of accounting standards (IFRS). Despite some arguments that have questioned the suitability of the IFRS for developing countries (Samuels and Oliga, 1982; Saudagaran and Meek, 1996), it has been claimed that the work of the IASB has had a positive impact on International Accounting Standards Committee (IASC) member developing countries (Iddamalgoda, 1986; Nobes and Parker, 1995). There are some indicators supporting such claims (Purvis et al., 1991; IASC, 1997).

From the above arguments, it is possible to hypothesize that IFRS standardization is among the external factors likely to influence the cost of equity capital in a country like Jordan, and consequently, to impact positively the cost of equity capital. Jordan does not have an equivalent of the Accounting Standards Board and, prior the imposition of IFRS, the country did not have agreed national accounting standards. The country has a close economic and trade relationship with European Union (EU) member countries and the USA. In addition, Jordan is an IASB member bodies through Jordanian Associated of Certified Public Accountants (JACPA). Moreover, Jordan was one of the IASC board members over the period 1988-1995 with aspiration to attract major foreign investments (Cairns, 2002).

As developing countries are not a homogenous group, the claim that the work of the IASB has had an influence on developing countries cannot be generalized until we understand the impact of the IFRS in many of these countries. For example, little is known about the influence of the IFRS on the extent of disclosure and its impact on cost of equity capital. In particular, there is no empirical evidence that investigates the effect of the all related and relevant IFRS on the extent of disclosure and cost of equity capital for companies listed in the stock market in a country like Jordan.

For the accounting years ending December 1998, IFRS was made mandatory through the Companies Act No.22 of 1997 and Securities Law No.23 of 1997 for all Jordanian public companies. Unfortunately there was no institutional change to check on compliance. However, this situation creates an opportunity to test for any factors, which affected the degree of compliance.

Based on the above mentioned literature, the research problem has been identified as with the following questions: *“Has the cost of equity capital been influenced by the extent of disclosure in compliance with the IFRS?”*

It is conceivable, that the cost of equity capital has been influenced by other changes taking place over the period 1996-2000 other than the change in the extent of disclosure in compliance with IFRS. In particular, the firms may have been changing their business risk or their financial risk and this need to be controlled for in assessing the impact of the change in disclosure on the cost of equity capital. It is also conceivable that the firms have responded to the change in the extent of disclosure in compliance with IFRS by changing their business and financial risk. This situation leads to addressing the following question: *“How has the cost of equity capital of Jordanian companies been influenced by business risk and financial risk?”*

III. RELEVANCE OF IFRS FOR DEVELOPING COUNTRIES: THE CASE OF JORDAN

It has been argued that IFRS are not appropriate for all developing countries because of their differences socially, culturally and politically (Briston, 1978; Samuels and Oliga, 1982; Perera, 1985). However, all of these studies investigated countries that were making the radical change from communistic to capitalistic economies.

Briston (1978) argued that it is a fact that developing countries are an amorphous and heterogeneous group. Therefore, IFRS are irrelevant and even dangerous when applied to very divergent nations. Samuels and Oliga (1982); Samuels (1990); Samuels (1993); who oppose the wholesale adoption of the IFRS, argue that accounting professions in developing countries should adapt reporting systems to meet the needs of

the economic decision making of each nation, rather than compiling with an arbitrary international standard. They claim it is possible the two can be developed simultaneously, but the latter should not be seen as a substitute for the former.

According to (Samuels 1993), the adaptation of IFRS is an example of an attempt to develop a system that satisfies both the development of locally relevant standards while adopting foreign systems. Perera (1985) believes that because IASB standards are based on the experiences of developed countries they cannot be successfully applied to developing countries. They further add that developing nations have special problems because of weak financial management accounting systems; accountants with inadequate accounting knowledge, weak oversight of these accountants, deficient accounting training and research.

Cairns (1997) argued, on the other hand, that the different economic, social and legal considerations which have influenced accounting practices within nations do not necessarily result in different standards among nations and that countries are reaching the same conclusions irrespective of their different cultural backgrounds (or reaching different answers in spite of their similar cultural backgrounds). The adoption of the IFRS is supported by many researchers (Aitken and Islam, 1983; Turner, 1983; Merei, 1985; Belkaoui, 1988; Cairns, 1990). They argued that the rationale behind such an adoption strategy may be to (a) reduce the set-up and production costs of accounting standards, (b) join the international harmonization drive, (c) enable its profession to emulate well-established professional standards of behavior and conduct, and (d) legitimize its status as a full-fledged member of the international community.

Jordan suffered from the lack of experience in developing national GAAP, an acute shortage of financial and manpower resources and a lack of legal procedures for financial disclosure. This situation is common with most developing countries that implemented IFRS as an alternative to undertaking the expensive burden of developing a national GAAP. Ashbaugh (1997) gave reasons why firms adopted IFRS. She found in her study that IFRS was more restrictive in respect accounting measurement choices in 16 of the 17 countries she examined and required more disclosures than Foreign-GAAP in every country, concluding that firms adopting IFRS were meeting higher recognition and disclosure standards than required under their domestic GAAP. Ashbaugh also compared foreign firms that adopted IFRS to those that choose Foreign-GAAP using a logit analysis. She found that the probability of adopting IFRS was higher for firms in countries with lower disclosure requirements. Her study found that, after controlling for firm size and the number of markets a firm was listed, the rigorous accounting principles that IFRS demands increased companies' access to capital.

Several academic accountants argue that IFRS is irrelevant for developing countries because of the size and dominance of the public sector (Briston, 1978; Samuels and Oliga, 1982; Perera, 1985). The situation in Jordan has been dramatically changed, however, by the move to privatization. Since the private sector has already taken over most businesses, this argument doesn't hold for Jordan. However, still the argument of IFRS being irrelevant may not be valid especially in the absence of empirical evidence. For example, in a country like the UK the public sector, in such institutions as the National Health Service (NHS), is a significant part of the economy. In Switzerland there are significant public sector owned enterprises. In these countries the public sector operates as a private business making a return on capital which means that the IFRS may be still relevant to them as well.

In capitalist economies, an active capital market is essential for allocating resources and promoting economic growth. A prerequisite for any capital market is confidence that prices are fair. Fair prices can only come about if both buyers and sellers are equally well informed. IFRS provides this information and at low cost to the Jordanian economy, an issue that will be investigated in this study.

Therefore, there is general agreement that useful accounting reports and appropriate accounting and auditing standards are essential for the development of the capital market and the economy itself (Mahon, 1965; Scott, 1968; Staking and Schulz, 1999). Jordan, on the other hand, never had a system for producing its own national GAAP. Moreover, neither the Companies Acts nor the Amman Capital Market Laws specified the accounting standards to be applied by Jordanian companies. The Jordanian Association of Certified Public Accountants (JAPCA), however, recommended the adaptation of IFRS in 1990. But, the JAPCA did not have the legal power to force Jordanian companies to follow its recommendations. The Companies Law No. 22 of 1997 and Securities Law No. 23 of 1997 required from that companies under their supervision adopt the IFRS as the basis for Jordanian accounting practices. Furthermore, the Securities Law adopted international auditing and performance evaluation standards for all entities falling under the supervision of the Security Commission.

In addition, since 1988 Jordan is one of the IASB member developing countries that have experienced significant change in its economic strategy and policies. This has been achieved by signing different open trading agreements, such as the free trading agreement with the EU and the USA. For these changes in capital markets and trade to happen, reliable accounting is required. Given that the accounting profession in Jordan is still in an early stage of development and is therefore incapable of developing its own standards within a reasonable time period, IFRS should be adopted by default. This would enable the accounting profession in Jordan to concentrate on more fundamental matters such as disclosure of financial information, valuation methods, poor internal control, lack of management accounting concepts, incomplete and inaccurate late records, un-auditable systems and lack of comparability of financial statements.

IV. EMPIRICAL LITERATURE REVIEW

A major link between economic and financial theory and contemporary accounting thought is the notion that a firm's commitment to greater disclosure should lower costs of capital that arise from information asymmetries. Information asymmetries create costs by introducing adverse selection into transactions between buyers and sellers of a firm shares. A commitment to increased levels of disclosure reduces the possibility of information asymmetries arising either between the firm and its shareholders or among potential buyers and sellers of firm shares. This, in turn, should reduce the discount at which firm shares are sold, and hence lower the costs of issuing capital (Diamond and Verrecchia, 1991; Baiman and Verrecchia, 1996; Levitt, 1998).

On the other hand, the extent to which firms benefit from increased disclosure remains a controversial issue in the absence of significant empirical evidence. Several models of asset pricing suggest that increased disclosure reduces the cost of equity capital, but little empirical evidence exists to support these claims. This absence of evidence fuels an ongoing debate among practitioners regarding the benefits of

enhanced disclosure. For example, the Special Committee on Financial Reporting of the American Institute of Certified Public Accountants (AICPA, 1994) (i.e. Jenkins Committee) states that an important benefit of greater disclosure is a lower cost of equity capital. In this regard, (Huddart et al., 1999) argues that the choice of full disclosure is robust even in the absence of cost of capital considerations. Verrecchia (1999) explaining (Huddart et al., 1999) argues broadly saying:

“...full disclosure may result even in the presence of an entrepreneur/managers of the firms who exploit shareholders through unrestricted insider trading, because it is likely to achieve the greatest market depth (P.282).”

In rebuttal, the Financial Executive Institute (Berton, 1994) argues that the enhanced disclosure called for in the Committee's report are targeted to keep stock traders from creating price volatility, thereby increasing risk and leading to a higher cost of equity capital. This argument was also supported by (Ball, 1995; Barth et al., 1999).

Ball (1995), on the other hand, observed that international harmonization of accounting standards is not necessarily a desirable goal. He points out that multiple users of accounting information have multiple objectives and that country-specific GAAP evolves in a political process balancing country-specific economic environments, users, and objectives. Barth et al. (1999) produced some direct evidence that the cost of capital does not always decrease when standards are harmonized. Their results suggest that regulators and standards-setters should exercise caution in their harmonization efforts. The fundamental point of their argument is that if one increases public disclosure, and increased public disclosure has the collateral effect of making private information acquisition less costly, then more disclosure can make markets more or less liquid. This, in turn, implies a lower or higher cost of capital. The reason for this result is clear; the direct effect of more disclosure is that generally it makes markets more liquid. However, when acquiring private information is costly, the proportion of informed investors is endogenous. If a collateral effect of public disclosure is to make private information acquisition cheaper, then it is conceivable that more disclosure results in more private information acquisition, which, in turn, may result in less liquid markets.

Theoretical research supporting a negative association between disclosure level and the cost of equity capital has followed two related thrusts. The first is that greater disclosure enhances stock market liquidity thereby reducing cost of equity capital either through reduced transactions costs or increased demand for a firm's securities (Demsetz, 1968; Copeland and Galai, 1983; Glosten and Milgrom, 1985; Amihud and Mendelson, 1986; Diamond and Verrecchia, 1991; Verrecchia, 1996; Barth et al., 1999; Huddart et al., 1999). Amihud and Mendelson claim that the cost of equity capital is greater for securities with wider bid-ask spreads because investors demand compensation for added transactions costs. By disclosing private information, firms can reduce the adverse selection component of the bid-ask spread and reduce their costs of equity capital. Diamond and Verrecchia, suggested that greater disclosure reduces the amount of information revealed by a large trade thereby reducing the advance price impact associated with such trades. As a result, investors are willing to take larger positions in a particular firm's stock than they otherwise would. This increases the

demand for the firm's securities and raises the current price of the firm's stock, thus reducing the cost of equity capital.

The second stream of research suggests that greater disclosure reduces estimation risk arising from investor's estimates of the parameters of an asset's return or payoff distribution. That is, greater uncertainty exists regarding the "true" parameters when information is low. If the estimation risk is non-diversifiable, investors require compensation for this additional element of risk (Klein and Bawa, 1976; Barry and Brown, 1985; Coles and Loewenstein, 1988; Handa and Linn, 1993; Coles et al., 1995; Clarkson et al., 1996). Barry and Brown (1985); Handa and Linn (1993); Coles et al. (1995) used a Bayesian Approach, which provides a predictive distribution that reflects investor uncertainty about the true parameters of risk. They concluded that estimation risk is non-diversifiable, is not reflected in the traditional CAPM formula for market beta (which is derived under the assumption that the parameters of the distribution are known) and that estimates of market beta are systematically too low for low information securities because market beta fails to incorporate estimation risk.

Clarkson et al. (1996) state that estimation risk has a significant non-diversifiable component, if resolution of uncertainty about low information securities affects the return earned on a market portfolio. They also argued, however, that the breadth of modern securities markets allows the correlation of returns, induced by the resolution of uncertainty, to be diluted to the point that any non-diversifiable component of estimation risk is immaterial. Nevertheless, they concluded that the extent of the impact of estimation risk remains, fundamentally, an empirical question.

In their theoretical argument, (Baiman and Verrecchia, 1996) have established a link between the liquidity needs of the capital markets, the optimal level of disclosure, the cost of capital, agency costs, and insider trading; in a model in which the costs and benefits associated with disclosure are endogenous. It is assumed, however, that the nature of the capital market is characterized by the potential liquidity needs of investors from whom capital is raised. Baiman and Verrecchia argued that market illiquidity and cost of capital fall because more disclosure encourages investment by individuals who may have future liquidity needs. Thus, as investors potential liquidity needs increase and the optimal level of disclosure increase; the liquidity of the market increases, the cost of capital decreases, the expected profits of insider trading decrease, and the manager's residual moral hazard problem increases leading to decreased efficiency. Hence, their analysis predicted a direct relationship between the use of such contracts, the market's potential liquidity needs, and the observed level of disclosure.

Although existing empirical research tends to support a negative association between disclosure level and cost of equity capital, the authors of the Jenkins Committee Report (1994, P.38) admit that the evidence to date does not present "*an empirical case that informative disclosure lowers the cost of capital.*" This is because prior research has examined the impact of disclosure on variables that are expected to be positively related to cost of equity capital and not on cost of equity capital itself (Frankel et al., 1995; Healy and Palepu, 1995; Healy et al., 1995; Welker, 1995).

Empirically, little is known about the impact of increased disclosure on cost of equity capital in both developing and developed countries. This study is an attempt to makeup for the lack of research in this field of accounting and finance. I will begin with a review of the relevant literature in chronological order.

Firth (1984) examined whether the amount of voluntary disclosure in corporate annual reports of 100 manufacturing companies in the U.K selected from 1000 largest companies in 1977 was linked to the assessment of stock market risk. Specifically, the level of disclosure, derived from a weighted disclosure index consisting of a list of 48 items, was examined to see if it was associated with systematic risk measured by beta (β), unsystematic risk measured by variance of residuals (σ^2e_j), and total return risk measured by variance of returns (σ^2R_j). Estimates of these risk measures were calculated from the Market Model. The study involved regressing measures of leverage, earnings beta, size, dividend yield and disclosure on measures of security risk.

No evidence of the disclosure score was found for having any impact on the level of systematic risk (β). Firth argues that although greater amounts of disclosure may be of use to the users of accounts, it is not because of assessing present and future levels of systematic risk. Moreover, his study also showed that the amount of disclosure had no impact on unsystematic risk (σ^2e) and variance of return (σ^2R). Such results are interesting, however, since its providing empirical evidence that there is no impact of disclosure on the cost of capital.

Botosan (1997) examined the association between the voluntary disclosure level as presented in the 1990 annual reports of a sample of 122 machinery industry U.S firms and the cost of equity capital by regressing firm-specific estimates of cost of equity capital on market beta, firm size and a self-constructed measure of disclosure level. The selection of items included in the weighted index for measuring the extent of disclosure were those items identified by investors and financial analysts as useful in investment decision making.

This empirical study provided direct evidence of an association between the cost of equity capital and disclosure level, and an indication of the magnitude of its effect. Holding cross-sectional variation in market beta and firm size were kept constant, a negative association between cost of equity capital and voluntary disclosure level for firms that attracted a low analysts following was reported. For firms with a high analyst following, however, no evidence of an association between measure of disclosure level and cost of equity capital was observed. She referred such result to the reason that the disclosure measure was limited to the annual report and accordingly might not provide a powerful proxy for overall disclosure level, since analysts play a significant role in the communication process.

Sengupta (1998) investigated the association between an industrial firm's overall disclosure quality ratings and its cost of debt financing, which could be seen as an extension of (Botosan, 1997) study in investigating the consequences of increased disclosure quality. The study eliminated the banking and insurance industries, since it believed that their financing decisions are affected by somewhat different factors than those of the industrial firms. A measure of a firm's overall disclosure quality was obtained from the annual volumes of the Report of the Financial Analysts Federation Corporate Information Committee.

By adopting multiple linear regression models, the study provided evidence that both measures of cost of debt employed were negatively associated with the disclosure ratings, after controlling for other potential determinants of a firm's cost of debt. Firms that were rated favorable by financial analysts for the degree of detail, timeliness and clarity of disclosures were perceived to have a lower default risk premium and were rewarded with a lower cost of borrowing. Sengupta (1998) argued that the

consequences of disclosure quality, therefore, were broader than a focus on equity issues alone could reveal. In addition, the findings also indicated that the relative importance of disclosures was greater in situations where there was greater market uncertainty about firm as reflected by the standard deviation of daily stock returns.

Richardson and Welker (2001) explored the relationship between financial and social disclosure and the cost of equity capital for a sample of 225 Canadian firms' observations financial reports from 87 different firms from the years ending 1990, 1991 and 1992. Richardson and Welker (2001) empirical measures of financial and social disclosure were drawn from the joint Society of Management Accountants of Canada (SMAC) / University of Quebec at Montreal (UQAM) ranking. In addition, the study followed (Botosan, 1997; Botosan and Plumlee, 2000; Gebhardt et al., 2000), for estimating the cost of equity capital using an accounting based valuation model developed in (Edwards and Bell, 1961; Feltham and Ohlson, 1995; Ohlson, 1995).

To test whether the financial and social disclosure scores were valid measures of these disclosures, (Richardson and Welker 2001) ran the regression between financial disclosure and firm size, financial performance, leverage, and financial analysts. Their results revealed that each of the variables, except financial performance, exhibited a significant and positive relation with financial disclosure, a result consistent with past literature. Moreover, a regression model was employed for testing the relationship between social disclosure scores with firm size, industry membership, financial performance, leverage, and analyst following (measured by the number of analysts making 1-year earning per share forecasts. The results were encouraging because the measures of disclosure appeared to be related to the same variables that were indicated in the preceding literature.

As it was found that risk premium was negatively related to the number of analysts following a firm and positively related to leverage (Gebhardt et al., 2000), this study included these variables as control variables in testing the relation between cost of equity capital and financial disclosure and social disclosure. Consistent with prior empirical research, this study found a significant negative relationship between financial disclosure and cost of equity capital for firms with low analysts following; agreeing with (Botosan, 1997) that the relationship with social disclosure was significantly positive.

Clearly, in spite of the regulatory and theoretical support for increased disclosure by firms, direct evidence of a negative empirical relation between disclosure levels and the cost of capital is limited and mixed (Botosan, 1997; Botosan and Plumlee, 2000; Richardson and Welker, 2001) on cost of equity capital, and on the cost of debt (Sengupta, 1998). Aside from the difficulties of measuring the cost of capital directly and estimating this relationship, one potential explanation for the mixed empirical results was argued by (Richardson and Welker, 2001); who indicated that if there is little variation in the information disclosed due to effective regulations, or if analysts routinely generate information independently of the firms' own disclosures, then the power of empirical tests will be significantly reduced. For example, (Botosan, 1997; Richardson and Welker, 2001) documented a statistically significant negative relation between the level of financial disclosure and cost of equity capital for their samples of USA and Canadian firms. This relationship held only for a subset of their sample that was characterized by a limited analyst following.

A better test of the relationship between corporate information disclosures and the cost of equity capital is possible by choosing markets and information sets where corporate disclosure plays a larger role in market valuations. Such a relationship will be tested in Jordan, a developing country, with a history of loose and vague financial reporting requirements before adopting fully the IFRS in 1998. This situation created an ideal environment for testing the possible impact of disclosure in compliance with IFRS on the selected JIC's cost of equity capital, an issue that has not been empirically tested before neither in developed nor in developing countries.

Investigating such issue, however, Botosan (1997) and Michael et al. (2001) made clear that business risk and financial risk are the major factors which should be controlled in exploring the issue whether there is an association between the cost of equity capital and the extent of disclosure.

Business risk is the variability of a firm's operating income, before subtracting interest payments. This is can be found by examining the dispersion of returns for all equity capital structure. This dispersion is caused by business related factors, such as the characteristics of the industry and the competitive advantage possessed by the firm within the industry. This risk will be influenced by factors such as the variability of sales volumes or prices over the business cycle, the variability of input costs, the degree of market power and the level of growth. Business risk is determined by general business and economic conditions (Botosan, 1997; Michael et al., 2001). On the other hand, financial risk is the additional variability in returns to shareholders that arises because of the debt of the financial structure. The increasing proportion of debt raises the firm's fixed financial costs. At high gearing levels there is an increased probability of the firm not only failing to make a return to shareholders, but also failing to meet the interest cost obligation, and thus raising the likelihood of insolvency (Arnold, 1998).

Brealey and Myers (2000) argued that the cost of capital is a hurdle rate for capital budgeting decisions. It depends on the business risk of a firm's investments. The risk of a common stock reflects the business risk of the real assets held by the firm. But shareholders also bear financial risk to the extent that the firm issues debt to finance its real investments. The more a firm relies on debt financing, the riskier its common stock is. Borrowing is said to create financial leverage or gearing. Financial leverage does not affect the risk or the expected return on the firm's assets, but it does push up the risk of the common stock and leads the stockholders to demand a correspondingly higher return.

Hamada (1972) originally showed that there is a linear relationship between a firm's beta and the leverage of the firm (the amount of debt in its capital structure). He discussed the relationship between the beta of the common stock and leverage of the firm in a world with and without taxes. He concluded that leverage increases the risk of equity in both cases. However, he added, that corporate taxes increase the equity beta less rapidly. This occurs because, under taxes, the government shares in the risks of the firm through its claim on taxes.

Therefore, the study concerns measuring how the cost of equity capital has responded to the move to IFRS taking into account the other factors; financial risk and business risk which should be controlled.

Many studies have investigated the correlation between leverage and some a variety of different factors. According to (Milton and Raviv, 1991), the consensus is that leverage increases with fixed assets, non-debt tax shields, investment opportunities,

and firm size; and decreases with volatility, advertising expenditure, the probability of bankruptcy, profitability and uniqueness of the product. Tangibility of assets, the market-to-book ratio (usually thought of as a proxy for investment opportunities), firm size, and profitability have been seen most consistently as being correlated with leverage in previous studies (Myers, 1977; Myers and Majluf, 1984; Long and Malitz, 1985). However, this study will investigate the association between leverage as a proxy for financial risk and the cost of equity capital, which has not been considered in the context of disclosure to the best knowledge of this researcher. However, the leverage ratio as a proxy for the financial risk of the firm has been adopted by previous empirical studies (Patton and Zelenka, 1997). In addition, the association between company size as a proxy for the business risk and the cost of equity capital have been investigated in a number of studies (Botosan, 1997; Michael et al., 2001).

V. SIGNIFICANCE OF THE STUDY

This is the first study addressing the issue of the impact of IFRS on the extent of disclosure and the cost of equity capital hoping it will contribute to a better understanding of the situation in Jordan. It is important to understand the impact of imposing IFRS on a developing country like Jordan, which suffers from vague disclosure laws and limited compliance to those laws. It could be added that this impact is increased when a country's economy depends heavily on trade with neighboring countries and foreign investment; an issue that is not part of this study.

Studies examining the impact of IFRS on extent of disclosure and as a result the financial consequences of that impact in various countries, developed and developing, are important. That is because they can help to identify whether or not such standards, which attempt to reduce differences in financial reporting and disclosure practice among countries, are succeeding. Success would mean that increasing disclosure would result in lower cost of equity capital.

Furthermore, an analysis of the effectiveness of IFRS adoption on the cost of equity capital could be useful to regulatory authorities. It would then be possible to more easily select an appropriate course of action when setting up or modifying existing regulations.

VI. RESEARCH METHODOLOGY

The purpose of this study was to determine empirically whether adopting IFRS by JIC's listed on ASE has influenced its cost of equity capital. Therefore, the research methodology was structured as follows; first, scope of the study; second, disclosure index development; third, cost of equity capital estimation, fourth, vector error correction (VEC) model and specifications used.

A. Scope of the Study

This is a case study that will assess the impact of IFRS through an investigation of the cost of equity capital in Jordan. Firstly, Jordan is a Middle Eastern country with an open economy, especially to the EU and the USA. Secondly, the Amman Stock Exchange is growing rapidly and this creates a possibility of testing the cost of equity

capital. Thirdly, however, little is known about the impact of the extent of disclosure in compliance with IFRS on the cost of equity capital not only in developing countries but also in developed countries as well. Fourthly, the sudden imposition of IFRS by the Jordanian companies Act and the accompanying Securities Law has created an opportunity for testing the effect of disclosure on the cost of capital.

To achieve the purpose of the study, a sample of the JIC'S was selected. These companies were operating for the five years period 1996-2000. They all had to have a full set of company accounts and they had to have been continuously traded over the entire period.

Having chosen a sample of companies, it was vital to assess which particular IFRS standard was relevant to which particular company. For example, IFRS related to consolidate financial statements would be rarely relevant because groups of companies are unusual in Jordan. However, there is always some ambiguity as to whether a standard or item is relevant or not, so some choices had to be made. This clearly affects the interpretation on what degree of compliance has been achieved. Unfortunately, the result is that this important variable, the degree of compliance, cannot ever be perfectly measured.

This study was limited to the disclosure of information in JIC's annual reports. Although there are other sources of disclosure, companies' annual reports were used because, according to (Tai et al., 1990) actual disclosure may be assessed most accurately by this means. The years covered in this study were 1996, 1997, 1998, 1999 and 2000. These years were selected in order to study the impact, before and after, of the adoption of IFRS in Jordan on the first of September 1998 of the Securities Law No. 23 of 1997. Giner (1997) argued that the analysis of several years, instead of focusing on one year per company as most studies do, would provide stronger and more relevant results.

B. The Disclosure Index

An updated disclosure index was first developed; containing all the operated, related and relevant IFRS, to find out the extent of the JIC's compliance with IFRS. Each individual IFRS relevant to the period of the study was analyzed to create a list of disclosures required. It has to be noted that many of these standards have been revised, reformatted and combined into other standards over the years. This has been taken into account in this study. The number of IFRS considered in this study for developing the updated disclosure index, therefore, was 18 over the period 1996-1998 and 21 over the period 1999-2000. The disclosure index covering the period 1996-1997 contained 137 applicable items to the selected JIC's, while the disclosure indices covering the years 1998, 1999 and 2000 contained 186, 221 and 219 items, respectively. The selected items are those that were influenced by the following considerations: 1) Items had to be potentially relevant to a set of JIC's that could be characterized in general as domestic manufacturing firms. 2) Each item had to be applicable to all the companies. 3) The items have been chosen so that it is easy to verify whether the company discloses it or not.

To measure this disclosure, the following procedure was used. 1) A disclosure-scoring sheet was constructed. 2) The period to be covered was selected. 3) Selection

of the JIC's listed on the Amman Capital Market during the period considered. 4) The scoring of the disclosure items. 5) Constructing a disclosure index.

The index used in this study was a modified unweighted index "*Partial Compliance (PC)*". The degree of compliance for each company, according to this approach, was measured by adding the degree of compliance for each standard. This implicitly gave equal weighting to each applicable standard and avoided the problem of unintentionally giving more weight to a standard with a larger number of items in the index. It gave equal weighting for each standard instead of equal weighing for each item as it was used in the unweighted approach by earlier studies.

The choice of area of accounting practice to be covered in this study was based upon the fact that Jordanian companies are small national companies comparing with those multinational ones. Furthermore, IFRS requirements concerning advanced accounting practices such as deferred tax, accounting for leases, inflation accounting, and so on are not considered in this study.

These procedures were designed to create the most accurate index possible. However, it must be pointed out, that developing this index was limited to those items where compliance was visible. The study inevitably ended up testing disclosure more than measurement, and accounting policy statements more than accounting practice. Therefore, while this index was the best approximation of compliance possible, it did contain its own biased. In particular, in measuring the extent of disclosure in compliance with IFRS, the study was reliant on the fact that companies were making clear statements of accounting policy and making them honestly.

C. Estimating the Cost of Equity Capital

One of the key hypotheses to be tested in this work is whether the introduction of IFRS had any influence on the cost of equity capital for Jordanian companies. To test this hypothesis requires a model of asset pricing. There are many models of asset pricing including the Capital Asset Pricing Model (CAPM), Arbitrage Pricing Theory or multi-factor models and the (Fama and French, 1995). The CAPM is used in this study because it is the dominant model in the academic and professional literature. Moreover, industry regulators throughout the world have adopted it.

Under the CAPM model the central risk to a publicly traded security is the systematic (or non-diversifiable risk). Other forms of risk that can be diversified away do not require compensation by investors. In the equilibrium of this model this systematic or beta risk is priced by the market risk premium where this is the difference between the expected return on the market portfolio and the risk free rate. The product of the market risk premium and the beta constitutes the risk premium in the model. The total expected return on a security, or its cost of equity capital, is the sum of this risk premium and the risk free rate.

The CAPM shows that it is only a security's systematic risk, which is of interest to a well-diversified shareholder. The value of β is, therefore, of key importance to the investor. The higher the systematic risk, the higher the return required by an investor. The major assumption of the CAPM is that the price of security j will adjust so that its expected return $E(r_j)$ is given by:

$$E(r_j) = r_f + (E(r_m) - r_f) \beta_j \quad (1)$$

where r_f is the risk-free rate of interest. The expected return depends linearly on the systematic risk (β_j). The relationship between $E(r_j)$ and β_j is known as the Security Market Line (SML). The β of a security is the standardized covariance of a security's return with the market return on the market portfolio. Therefore:

$$\text{Beta of security } i = \text{Cov}(r_j, r_m) / \text{Var}(r_m) \quad (2)$$

To assess the impact of IFRS on the cost of equity capital, we need to look at its impact on the three components of the CAPM – the risk free rate, the market risk premium and beta. It is unlikely that IFRS will influence the risk free rate since this is will be determined by macroeconomic factors in Jordan and the world economy. For this reason IFRS only effects the risk premium of the cost of capital and it's two components.

It has proved to be difficult to estimate the impact of the IFRS on the market risk premium of Jordan. To estimate market risk properly it would require an accurate estimate of the expected rate of return on the entire market portfolio of Jordan stocks and the risk free rate. Unfortunately Jordan issued very few treasury bills over this period making a reliable estimate difficult. However, since the market risk premium was remarkably stable throughout the international community during this period, it was used as the market risk premium of this study.

This leaves beta as the only factor to be estimated. For this purpose, the Market Model was used. However because the CAPM always forces the beta of the market portfolio to be one, a security's beta was estimated against an international portfolio and not a Jordanian market portfolio. This methodology then enabled a test of the hypothesis to be made in the context of the international community. In other words, this study investigated whether the introduction of IFRS lead to a reduction in the cost of equity capital of Jordanian companies compared to other international companies.

The Market Model is a statistical model, which relates the return of any given security to the return of the market portfolio. The model's linear specification follows from the assumed joint normality of asset returns. For any security i we have:

$$r_{ij} = \alpha_{ij} + \beta_j r_m + \varepsilon_{ij} \quad (3)$$

We assumed the ε_{ij} were uncorrelated random error terms with mean zero and constant variance σ^2 (homoskedasticity and not hetroskedasticity)⁵. That is,

$$E(\varepsilon_{ij}) = 0, \text{Var}(\varepsilon_{ij}) = \sigma^2, \text{Cov}(\varepsilon_i, \varepsilon_j) = 0$$

where r_{ij} and r_m are the period- t returns on security i and the market portfolio, respectively, and ε_{ij} is the zero mean disturbance term, constant variance and not correlated with itself or with the market return. α_{ij} and β_j , and ε_{ij} are the parameters of the market model.

D. Vector Error Correction (VEC) Model

To determine whether the extent of disclosure in compliance with IFRS was effective in influencing the JIC's cost of equity capital, after controlling for the variables financial risk and business risk, an estimation method was used to test the following hypothesis:

“H₀: There was no influence of the extent of disclosure in compliance with IFRS, financial risk, and the business risk on the JIC's cost of equity capital listed on ASE and their shares traded during the total period 1996-2000”.

The cost of equity capital was the dependent variable. The first independent variable was business risk, as estimated by a logarithm of net sales revenue, as a proxy for company size. The second variable was financial risk as estimated by a natural logarithm of leverage ratio and the extent of company disclosure in compliance with IFRS.

The structural approach to simultaneous equations modelling uses economic theory to describe the relationships between several variables of interest. The resulting model is then estimated, and used to test the empirical relevance of the theory. Unfortunately, economic theory is rarely specific enough for precise specification of the dynamic relationship between variables. Furthermore, estimation and inference are complicated by the fact that endogenous variables may appear on both the left and right sides of the equations. These problems lead to alternative, non-structural, approaches to modelling the relationship between several variables.

The finding that many macro time series may contain a unit root has spurred the development of the theory of non-stationary time series analysis. Engle and Granger (1987) pointed out that a linear combination of two or more non-stationary series may be stationary. If such a stationary, or I(0), linear combination exists, the non-stationary (with a unit root), time series is said to be cointegrated. The stationary linear combination is called the cointegrating equation and may be interpreted as a long-run equilibrium relationship between the variables. For example, consumption and income are likely to be cointegrated. If they are not, then in the long-run consumption might drift above or below income, so that consumers were irrationally spending or piling up savings.

A vector error correction (VEC) model is a restricted VAR that has cointegration restrictions built into its specification, so that it is designed for use with nonstationary series that are known to be cointegrated (Engle and Granger, 1987). The VEC specification restricts the long-run behaviour of the endogenous variables to converge of their cointegrating relationships while allowing for a wide range of short-run dynamics. The cointegration term is also known as the “error correction term”, since its deviation from long-run equilibrium is corrected gradually through a series of partial short-run adjustments. In addition, Engle and Granger added that it is important that the variables included in the model have the same order of integration if it is higher than zero. Therefore, the estimation of the output level has the following long-linear form:

$$C_t = \alpha_0 + \alpha_1 \text{DIS} + \alpha_2 \text{FR} + \alpha_3 \text{BR} + \varepsilon_t \quad (4)$$

where α_0 is a constant term, C_t is the cost of equity capital, DIS is the extent of disclosure in compliance with IFRS, FR is the Financial Risk estimated by a natural

logarithm of leverage ratio, and BR is the Business Risk estimated by a natural logarithm of net sales revenue.

VII. EMPIRICAL RESULTS

The four variables of equation (4) and their first differences were subject to the Augmented Dickey-Fuller (ADF) tests for unit roots. The integrations are seen in Table (1) along with their one percent levels of significance. It can be seen that all variables are integrated with order one (i.e. I (1)). Such results indicate that the variables' levels are non-stationary, while their first differences are stationary.

Table 1
ADF unit root test

| Variables | Lags | D-W | Calculated ADF | 1%Critical Value | AIC | SBC |
|--------------|------|-------|----------------|------------------|--------|--------|
| C | 1 | 2.148 | -2.164 | -2.611 | -3.762 | -3.684 |
| DIS | 1 | 2.249 | -0.138 | -2.611 | -1.723 | -1.645 |
| FR | 1 | 2.179 | -1.864 | -2.611 | 0.317 | 0.394 |
| BR | 1 | 2.123 | -0.674 | -2.611 | 4.813 | 4.891 |
| ΔC | 1 | 2.281 | -8.864 | -2.612 | -3.877 | -3.799 |
| ΔDIS | 1 | 1.976 | -7.863 | -2.612 | -1.810 | -1.731 |
| ΔFR | 1 | 2.175 | -8.561 | -2.612 | 0.230 | 0.309 |
| ΔBR | 1 | 1.979 | -8.355 | -2.612 | 4.652 | 4.731 |

In Table 1, “Lags” represent the number of lagged first differences of the variable used in the ADF equation to get white noise residuals. D-W is the Durbin-Watson values for the residuals in the ADF equation. All variables are in log form. The Akaike Information Criterion (AIC) and the Schwartz Bayesian Criterion (SBC) yield smaller values for the first lag length.

Since the variables are all I(1), they might be cointegrated if there is one or more stationary linear combination among them. If these variables are cointegrated, they are not only stationary within the first difference, but also in a stable long-run equilibrium linear relationship. Thus, both conditions of employing the VEC model are met.

To test whether there is one or more stationary linear combination among the variables (i.e. the existence of cointegration); the (Johansen, 1988) maximum likelihood method was used. The Test results are shown in Table 2.

The results of the Likelihood Ratio Test indicate that four cointegration equations at 5% exist. This cointegration vector, normalized on C, is:

$$[C, DIS, FR, BR] = [-1.000, 0.000357, 0.007279, -0.069217]$$

The results of both the Unit Root Test and the Cointegration Test indicate that there were some long-run relationships between the variables in the system allowing utilizing The results of both the Unit Root Test and the Cointegration Test indicate that there are some long-run relationships between the variables in the system which allow utilization of a Vector Error Correction (VEC) model.

Table 2
Johansen cointegration test

| Eigenvalue | Likelihood Ratio | 5% Critical Value | 1% Critical Value | Number of Cointegrating Equations |
|------------|------------------|-------------------|-------------------|-----------------------------------|
| 0.634 | 110.677 | 47.21 | 54.46 | None** |
| 0.413 | 62.421 | 29.68 | 35.65 | At most 1** |
| 0.355 | 36.805 | 15.41 | 20.04 | At most 2** |
| 0.279 | 15.724 | 3.76 | 6.65 | At most 3** |

*(**) Denotes rejection of the hypothesis at 5% (1%) significance level. Likelihood Ratio Test indicates 4 cointegration equation(s) t 5% significance level.

There is quite close relationship between cointegration and error correction models. Engle and Granger (1987) defined error correction as a proportion of the equilibrium from one period that is corrected in the next period. An error correction model relates the changes in one variable to past equilibrium errors. In fact, error correction models provide a way of combining both; dynamics of the short-run (i.e. changes) and the long-run (i.e. levels) adjustment processes simultaneously (Lim and McAleer, 2001). The VEC estimates are given in Table 3 below.

Table 3
Vector error correction (VEC) estimates

| Independent Variable | Estimated Coefficient | Std. Error | t-statistic | Probability |
|--------------------------|-----------------------|------------|-------------|-------------|
| Constant | -0.0054 | 0.0361 | -0.1496 | 0.8818 |
| ΔDIS | -0.0441 | 0.0622 | -0.7101 | 0.4814 |
| ΔFR | -0.0295 | 0.0230 | -1.2812 | 0.2068 |
| ΔBR | -0.0034 | 0.0022 | -1.5331 | 0.1324 |
| VEC_{t-1} | 0.1320 | 0.8121 | 0.1625 | 0.8716 |

The ΔC is the dependent variable. $R^2 = 0.1286$, Adjusted $R^2 = 0.049$, D-W = 2.7109, S.E. of regression = 0.03851, F-statistic = 1.6227, Prob.(F-statistic) = 0.1855.

The results of this study indicate that none of the independent variables significantly influenced the cost of equity capital. The coefficients of disclosure, financial risk, business risk, and the vector error correction are (-0.0441), (-0.0295), (-0.0034), and (0.1320). However, all of these variables are negative and statistically not significant. In addition, the coefficient of the VEC term shows that the system corrects its last period of disequilibrium (i.e. the speed of adjustment to restore equilibrium in the dynamic model) by 13.2% a year, a level of adjustment not statistically significant.

After the Jarque-Bera (JB) test for normality of residuals was performed it indicated that the normality assumption of OLS residuals could not be rejected since the JB value was (0.6331) with a probability of (0.7387). The ARCH LM test for autocorrelation in the error variance was conducted and it showed that ($\chi^2 = 0.1592$) with p-value (0.6899), which indicated that, the error variance was not serially

correlated (i.e. the residuals did not contain significant ARCH effects). The results of CUSUM statistic and CUSOM of Squares (i.e. CUSOMQ statistic) gave quite interesting results as Figure 1 shows.

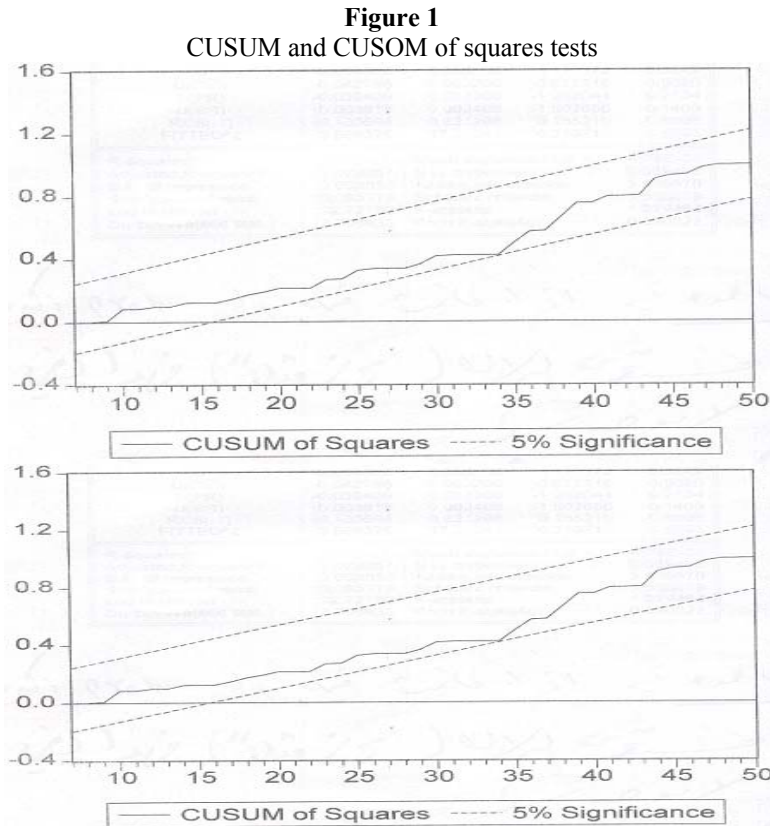


Figure 1 demonstrates that the residuals inside two standard error bands indicate stability in the parameters of the equations. Such results imply that the null hypothesis of constant parameters should be accepted. In addition, the Ramsey RESET test (i.e. regression specification error test) for functional form misspecification showed that the computed F is (0.04696), which is not significant enough at 5% level (i.e. Probability 0.8294) implying that the null hypothesis that the model is misspecified was rejected.

Using RATS program, the dynamic adjustments of disclosure, financial risk, and business risk to the system are represented by the variance decomposition in Table 4.⁷ The results demonstrate that the response of cost of equity capital (C) to a standard deviation shock in the disclosure, financial risk, business risk, and to its own shock.

Table 4 illustrates variance decomposition for one to ten years ahead of the variables. The results indicate that the effect of cost of equity capital shocks are greater than the effect of disclosure in compliance with IFRS, financial risk, and business risk

shocks in influencing the movements in the cost of equity capital throughout the 1996-2000 period studied. However, disclosure in compliance with IFRS explanation of the forecast error variance of cost of equity capital is greater than that for disclosure in compliance with IFRS, financial risk, and business risk variables. As for the cost of equity capital to its own shock, the explanation of its forecast error variance was 100% in the first year; while disclosure in compliance with IFRS, financial risk, and business risk shocks influence was zero. The cost of equity capital had started to be influenced two years after the disclosure shock began with a gradual, but increasing, level of effect over the decade studied reaching a maximum of 12.95%. On the other hand, cost of equity capital continued to be influential two years after the financial risk and business risk shocks; with an almost fixed level of effect over the ten-year period considered (i.e. FR forecast error variance in a ten-year period 10.54% and BR forecast error variance in a ten-year period 0.31%). In Table (4) it can be seen that the cost of equity capital correctly explains 76.18% of the forecast error variance over the decade studied. Generally speaking, the results reported in Table 4 highlight the fact that none of the variables considered influenced the JIC's cost of equity capital in the long run.

Table 4
Variance decomposition test

| Variance Decomposition of Cost of Equity Capital (C): | | | | | |
|--------------------------------------------------------------|-------------|----------|------------|-----------|-----------|
| Period | S.E. | C | DIS | FR | BR |
| 1 | 0.023506 | 100.0000 | 0.000000 | 0.000000 | 0.000000 |
| 2 | 0.023813 | 97.56826 | 2.218842 | 0.212900 | 2.26E-06 |
| 3 | 0.027108 | 86.82732 | 2.931958 | 10.12063 | 0.120100 |
| 4 | 0.027325 | 85.49154 | 4.246903 | 10.14232 | 0.119229 |
| 5 | 0.028052 | 83.46511 | 6.103639 | 10.21439 | 0.216862 |
| 6 | 0.028282 | 82.12984 | 7.482813 | 10.12154 | 0.265799 |
| 7 | 0.028737 | 80.13821 | 8.823409 | 10.77856 | 0.259816 |
| 8 | 0.028996 | 78.73667 | 10.22994 | 10.76887 | 0.264516 |
| 9 | 0.029250 | 77.45724 | 11.64679 | 10.60203 | 0.293947 |
| 10 | 0.029493 | 76.18591 | 12.95456 | 10.54500 | 0.314535 |
| Variance Decomposition of Disclosure (DIS): | | | | | |
| Period | S.E. | C | DIS | FR | BR |
| 1 | 0.089406 | 5.505148 | 94.49485 | 0.000000 | 0.000000 |
| 2 | 0.095123 | 6.300498 | 92.49472 | 0.369472 | 0.835306 |
| 3 | 0.109880 | 4.787858 | 89.83282 | 4.736299 | 0.643027 |
| 4 | 0.117155 | 4.447040 | 89.93165 | 4.990192 | 0.631117 |
| 5 | 0.126291 | 3.855706 | 89.55785 | 5.878722 | 0.707725 |
| 6 | 0.133124 | 3.471634 | 89.89893 | 5.861284 | 0.768151 |
| 7 | 0.140603 | 3.119836 | 89.85310 | 6.217905 | 0.809155 |
| 8 | 0.147286 | 2.866061 | 89.84068 | 6.458870 | 0.834392 |
| 9 | 0.153943 | 2.635683 | 89.82352 | 6.683277 | 0.857517 |
| 10 | 0.160145 | 2.440044 | 89.88542 | 6.793173 | 0.881365 |

Table 4 (continued)

| Variance Decomposition of Financial Risk (FR): | | | | | |
|-------------------------------------------------------|-------------|----------|------------|-----------|-----------|
| Period | S.E. | C | DIS | FR | BR |
| 1 | 0.206619 | 2.593540 | 5.024556 | 92.38190 | 0.000000 |
| 2 | 0.209944 | 4.054923 | 6.311890 | 89.48132 | 0.151864 |
| 3 | 0.217478 | 7.149509 | 7.026145 | 84.47409 | 1.350259 |
| 4 | 0.218837 | 7.338820 | 7.786047 | 83.43529 | 1.439848 |
| 5 | 0.222267 | 7.725182 | 8.996649 | 81.88222 | 1.395948 |
| 6 | 0.223981 | 7.683128 | 10.10290 | 80.83440 | 1.379579 |
| 7 | 0.225638 | 7.645950 | 11.29855 | 79.66659 | 1.388916 |
| 8 | 0.227149 | 7.551470 | 12.37890 | 78.67587 | 1.393757 |
| 9 | 0.228882 | 7.469240 | 13.43993 | 77.70599 | 1.384840 |
| 10 | 0.230493 | 7.375092 | 14.47846 | 76.76858 | 1.377867 |
| Variance Decomposition of Business Risk (BR): | | | | | |
| Period | S.E. | C | DIS | FR | BR |
| 1 | 2.138923 | 3.596006 | 28.05080 | 0.015885 | 68.33731 |
| 2 | 2.341206 | 4.886868 | 31.23769 | 2.248869 | 61.62657 |
| 3 | 2.782249 | 4.186873 | 49.09985 | 3.073340 | 43.63994 |
| 4 | 3.040774 | 3.523410 | 56.45930 | 3.282399 | 36.73489 |
| 5 | 3.351559 | 3.285619 | 60.75000 | 5.555040 | 30.40935 |
| 6 | 3.587822 | 2.891340 | 64.56852 | 5.879896 | 26.66024 |
| 7 | 3.821994 | 2.554953 | 67.81442 | 5.981368 | 23.64926 |
| 8 | 4.036526 | 2.296728 | 70.16692 | 6.206393 | 21.32995 |
| 9 | 4.249912 | 2.107312 | 71.96566 | 6.582682 | 19.34435 |
| 10 | 4.448319 | 1.935997 | 73.54432 | 6.766166 | 17.75352 |

Ordering: C, DIS, FR, BR

Table 5
Granger causality test

| H₀ | F-Statistics | Prob. | Reject H₀ / Accept H₀ |
|------------------------------------------|---------------------|--------------|----------------------------------------------------|
| DIS does not Granger Cause C | 0.0014 | 0.99859 | Accept H ₀ |
| C does not Granger Cause DIS | 0.2581 | 0.77373 | Accept H ₀ |
| Log (FR) does not Granger Cause C | 2.24020 | 0.11872 | Accept H ₀ |
| C does not Granger Cause Log (FR) | 1.20404 | 0.30989 | Accept H ₀ |
| Log (BR) does not Granger Cause C | 0.08352 | 0.92002 | Accept H ₀ |
| C does not Granger Cause Log (BR) | 0.79128 | 0.45975 | Accept H ₀ |
| Log (FR) does not Granger Cause DIS | 1.92733 | 0.15790 | Accept H ₀ |
| DIS does not Granger Cause Log (FR) | 0.23046 | 0.79514 | Accept H ₀ |
| Log (BR) does not Granger Cause DIS | 1.55091 | 0.22368 | Accept H ₀ |
| DIS does not Granger Cause Log (BR) | 3.23108 | 0.05028 | Accept H ₀ |
| Log (BR) does not Granger Cause Log (FR) | 0.06824 | 0.93413 | Accept H ₀ |
| Log (FR) does not Granger Cause Log (BR) | 0.15919 | 0.85333 | Accept H ₀ |

To support the choice of policy variables in the St. Louis equation model, pair wise Granger Causality test was implemented for the three independent variables. It was found that none of the variables Granger Cause the cost of equity capital for JIC listed in ASE. Table 5 reports the test results.

The results show that none of the three independent variables, the extent of disclosure in compliance with IFRS (DIS), the financial risk (FR), or the business risk (BR); Granger-causes the cost of equity capital (C).

The Environment Determinism Theory (EDT) says that both national and international environment factors effect accounting disclosure in a country (Wallace, 1987; Cooke and Wallace, 1990). I strongly support the same view in relation to the cost of equity capital.

It could be argued that many factors affected the cost of equity capital during the period of our study. 1) The JIC were not in full compliance with IFRS. 2) The Jordan economy was and continues to be dependent on her neighbours. 3) The regional conflict between Palestine and Israel. 4) The international tension between Jordan's biggest trading partner, Iraqi, and the USA, the UK and other regional nations since the Gulf War in 1991. 5) The eviction of the United Nations for Monitoring, Verification and Inspection Commission (UNMOVIC) from Iraqi and invasion in 1998 that followed conducted by the USA and UK. 6) The sickness and death, on February 7 1999, of King Hussein the longest serving executive head of state in the world. 7) Doubts about ASE efficiency might make estimating the expected return of the cost of equity capital ambiguous.

VIII. CONCLUSION

This study investigated the Effectiveness of IFRS adoption on JIC's cost of equity capital listed on the ASE from 1996 to 2000; using the time series techniques, Unit Root, Cointegration, and VEC model. The results show that the variables considered are not stationary in their levels, but have long-term relationships. However, the second differences for all the variables considered were stationary, which allowed for the adoption of the VEC model, after mating the stationary and cointegration conditions. Another tool that was used to investigate whether variables have short-term relationships was the Variance Decomposition Test. To determine the direction of relationships among the variables the Granger Causality test was applied.

The results indicate that none of the independent variables significantly influenced the cost of equity capital. The coefficients of disclosure, financial risk, business risk, and the vector error correction were (-0.0441), (-0.0295), (-0.0034), and (0.1320), respectively. However, all of those variables were negative and statistically insignificant. In addition, the coefficient of the VEC term shows that the system corrected its last period disequilibrium (i.e. the speed of adjustment to restore equilibrium in the dynamic model) by 13.2% a year a level of adjustment that is not statistically significant.

Variance decomposition results show that none of the variables had significantly influenced the cost of equity capital (i.e. DIS, FR, and BR explain 12.95%, 10.54%, 0.31%, respectively of the forecasted error variance of cost of equity capital). The cost of equity capital explains 76.18% of its forecast error variance in a ten-year period. Granger causality test shows that none of the variables had significant effect on JIC's

cost of equity capital. According to the Environment Determinism Theory (EDT), both national and international factors have an important effect on accounting disclosure in a country. By extension, I strongly believe, the same factors would affect the cost of equity capital in a developing county like Jordan.

The Environment Determinism Theory (EDT) maintains that both national and international environmental factors effect accounting disclosure in a nation (Wallace 1987; Cooke and Wallace 1990). This is also applicable to the cost of equity capital. For example, Jordan is economically dependent on its neighbours. The continual tension between Palestine and Israel to the west; and the Iraq's difficulties with the USA and the UK has had a negative impact on Jordan's economy. Internally, Jordan's markets were rocked by the untimely death of King Hussein.

While developing nations will always be effected by external and internal events, everything else is equal; I think that adopting IFRS and following up with proper disclosure procedures will reduce the cost of capital within developing markets.

ENDNOTES

1. Outstanding foreign debt to GDP was 228.1%, 97.9%, and 81.1% during the years 1989, 1995, and 2000, respectively (for more details see the Monthly Statistical Series, Department of Research and Studies, Different Issues, Amman Jordan; Department of Statistics (DOS) Bulletin, Different Issues, Amman, Jordan).
2. Effective 1 April 2001, the International Accounting Standards Board (IASB) assumed accounting standard setting responsibilities from its predecessor body, the International Accounting Standards Committee (IASC). This was the culmination of a restructuring based on the recommendations of the report Recommendations on Shaping IASC for the Future. According to the new structure, the IASC is an independent organization with two main bodies, the Trustees and the IASB, as well as a Standards Advisory Council and the International Financial Reporting Interpretations Committee. Under the new organization, the IASC Foundation Trustees appoint the IASB members, exercise oversight and raise the funds needed, whereas IASB has sole responsibility for setting accounting standards called International Financial Reporting Standards (IFRS) (www.IASC.org).
3. Botosan (1997) argued that cost of equity capital could be estimated using the Capital Asset Pricing Model (CAPM) which defines expected returns as the sum of the expected risk free rate ($E(r_f)$), the product of a firm's estimated market beta (β) and the expected risk premium ($E(r_m - r_f)$). He added, as CAPM assumes that cross-sectional variation in market beta alone derives variation in the cost of equity capital, and as a result the CAPM approach provides no role for disclosure level unless one assumes cross-sectional variation in disclosure level induces variation in beta, a notion that has no theoretical support, the accounting based valuation formula was adopted in his study for estimating the cost of equity capital. It has to be argued, however, this study is an attempt to examine empirically the notion that variation in the extent of disclosure in compliance with IFRS could induces variation in beta as a measurement for the systematic risk and consequently variation in cost of equity capital.
4. For more details see Hill, R., W. E. Griffiths, and G. G. Judge (2001), *Undergraduate Econometrics* (2nd ed.). USA - New York: John Wiley & Sons, Inc..

5. For additional discussion of VEC model, see Davidson, R. and J. G. MacKinnon (1993), *Estimation and Inference in Econometrics*, Oxford University Press, Oxford, pp. 715-30., and Hamilton, J. D. (1994a), *Time Series Analysis*, Princeton University Press, pp. 339-42..
6. The Variance Decomposition Test was repeated to determine if the results would be changed significantly. The new variables were: C, FR, DIS, and BR. Generally speaking, the output highlights the fact that the results were almost the same. Other tests were conducted using the following order of the variables: C, FR, BR, DIS, and DIS.

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