

**The Impact of Information Technology on Internal  
Control over Financial Reporting in Corporations in  
the Kingdom of Saudi Arabia**

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## Abstract

This research aims at explaining the positives and negatives effects of IT on internal control over financial reporting in corporations generally. In addition, it is concerned with explaining how can get benefits of positives effects and avoid negative effects of IT on internal control over financial reporting in corporations generally, and in Saudi listed companies particularly.

This study is based on survey, i.e. questionnaires for a number of internal auditors in corporations in Riyadh city to achieve the research objectives. In addition, it is based on desk study from literature review.

The research revealed that IT supports internal control over financial reporting system, and it helps to avoid errors and mistakes. Under IT, internal control over financial reporting system became more effective. Hence, IT helps attaining the optimum exploitation of the available resources for achieving organizational targets. Under IT, there are some difficult to change system parameters and to update current systems for using new technologies. New technology will cost corporations a lot, because it needs special skills, hardware and software. Hence, under IT, internal control over financial reporting system needs more monitoring and maintenance.

The study recommends, for getting benefits of positives effects of IT on internal control over financial reporting, it is necessary to use IT in the field of internal control over financial reporting effectively. In addition, it is necessary removing duplicated legacy manual controls due to implementation of automated controls. However, for avoiding negative effects of IT on internal control over financial reporting, it is necessary using restricted access of systems and making reduction in the cost that related to using IT.

**Key words:** Information Technology (IT), Internal Control, Financial Reporting, Corporations the Kingdom of Saudi Arabia.

# **PART ONE: INTRODUCTION**

## ***1.1. Preface:***

Today's Information Technology (IT) within business sector around the world plays an important role in all fields. However, internal control of financial reporting is considered one of the most important fields that related to IT. Under IT, Internal control of financial reporting is different from internal control of financial reporting under traditional position. Under IT internal control of financial reporting needs more requirements and involves some strengths, weaknesses, challenges, opportunities and threats.

## ***1.2. Research Problem:***

Generally, internal control of financial reporting under IT in the KSA is an important Accounting issue. This is due to the importance of the Saudi stock market in relation to international stock markets. Therefore, internal control of financial reporting under IT has positives and negatives effects. So, it is necessary to examine the determinants of these effects (impact) either positive or negative within internal control over financial reporting. Internal control over financial reporting has long been recognized as an important feature of a company (see for example: Kinney, Maher & Wright, 1990; Kinney, 2000 and Kinney, 2001). Under Section 404 of Sarbanes-Oxley, managers must review and provide an annual report on their internal controls, assessing the effectiveness of the internal control structure and procedures.

Therefore, the problem in this study is to determine positives and negatives effects of IT on internal control over financial reporting, to determine its impacts on the Saudi stock market (as a big emerging market), and to explain how can get benefits from positives effects and avoid negative effects with application to Saudi listed companies.

### ***1.3. Research Questions:***

In the terms of the research problem, this research includes the following questions:

- A. What are the **positives and negatives** effects of IT on internal control over financial reporting in corporations in the Kingdom of Saudi Arabia?
- B. How can **get benefits** of positives effects and avoid negative effects of IT on internal control over financial reporting in corporations in the Kingdom of Saudi Arabia?

### ***1.4. Research Objectives and Its Importance:***

To explain how the two research questions are related to the research problems, this research aims at achieve two main objectives as follows:

- **The first objective** is concerned with explaining the positives and negatives effects of IT on internal control over financial reporting in corporations generally.
- **The second objective** is concerned with explaining how can get benefits of positives effects and avoid negative effects of IT on internal control over financial reporting in corporations generally, and in Saudi listed companies particularly.

Therefore, the importance of this research lies in dealing with an important and interesting of research. This due to the necessity of determining the positives and negatives effects of IT on internal control over financial reporting in corporations and how can get benefits of positives effects and avoid negative effects of IT on internal control over financial reporting in corporations.

### ***1.5. Research Methodology:***

In order to achieve the research objective, the current research depends on the theoretical approach in reviewing the literature in order to explain the positives and negatives effects of IT on internal control over financial reporting in corporations in general and in the Saudi corporations in particular. In addition, a survey was conducted, based on questionnaires sent to employees in Saudi listed companies in Riyadh city.

## ***1.6. Research Structure:***

This paper is structured along the following lines: **Part One**, related to **Introduction**, describes the research problem, the research questions, the research objectives and importance, the research methodology, and structure of the research. **Part Two** is related to previous studies. **Part Three** is related to **the Conceptual Outlines of the Study**. **Part Four** is related to **the empirical study**, **Part Five** provides a **Summary, Conclusions, and recommendations**.

## **PART TWO: PREVIOUS STUDIES**

There are many studies that are related to the impact of information technology on internal control of financial reporting; such as the following studies:

### **1- XIAO, DYSON & POWELL's Study (1996)**

#### **"The Impact of Information Technology on Corporate Financial Reporting: A Contingency Perspective"**

This study aims at investigating the impact of information technology on corporate financial reporting. Its general assumptions are that the impact of IT on different aspects of corporate financial reporting (CFR) varies and the degree and pattern are contingent upon environmental, organizational, and managerial characteristics. Hypotheses have been developed to expand the framework. An evaluation of the framework against criticisms of the contingency theory of organizations (CTO) shows that it avoids several much criticized problems although care must be taken to ameliorate other pitfalls. According to this study, previous studies investigating information technology (IT) impact on accounting suffer from a lack of theoretical guidance. An examination of the nature of IT, financial information and CFR indicates that the evaluation of IT impact on CFR requires a general, flexible and adaptive framework.

## **2- Rezaee, Elam & Sharbatoghlie (2001)**

### **"Continuous Auditing: the Audit of the Future"**

This study aims at investigating the impact of technological advances (e.g. e-commerce and the Internet) on business practices and the process of recording and storing business transactions. According to Rezaee, Elam & Sharbatoghlie (2001) Extensible Business Reporting Language (XBRL) will soon be built into accounting and reporting software which would allow on-line real-time preparation, publication, examination, and extraction of financial information. Thus, outside, independent auditors should use continuous, electronic auditing when most financial information exists only in electronic form under real-time accounting systems. Continuous auditing and its implications for independent auditors, including internal control considerations and audit procedures, are described and analyzed.

## **3- Yang & Guan's Study (2004)**

### **"The Evolution of IT Auditing and Internal Control Standards in Financial Statement Audits: The Case of the United States"**

According to Yang & Guan's study (2004), the rapid escalation of technology and the use of computers in business practice result in more information technology (IT) auditing and internal control standards and guidelines to assist auditors in their roles and responsibilities. Several organizations, such as the American Institute of Certified Public Accountants (AICPA), the International Federation of Accountants and the Information Systems Audit and Control Association (ISACA), have issued standards in this area to be observed by their members in performing an IT audit. This paper traces the evolution of US IT auditing and internal control standards in financial statement audits and discusses their significance for the auditing profession. This study primarily focuses on the discussion of the IT audit standards issued by the AICPA and ISACA. As the use of computers in business data processing gets more widespread and the integration of IT in business processes gets more intricate.

The researchers expect to see more pronouncements of IT audit standards in the future. So, the study recommended that auditors should well understand these pronouncements, standards and guidelines when performing an IT audit.

#### **4- Jones and Xiao's Study (2004)**

##### **"Financial Reporting on the Internet by 2010: a Consensus View"**

This paper reports the final results of a Delphi study into corporate financial reporting by 2010. Twenty UK experts in accounting and the Internet representing academics, auditors, regulators, reporting companies and users participated in the study. A three-dimensional conceptual framework was adopted consisting of the role of the Internet (i.e. problem solver or problem creator), the determinant of change (technological determinism, non-technological determinism or contingency perspective), and the pace of change (conservatism, gradualism or radicalism). The consensus view was that the financial reporting package would evolve into a core of general purpose, standardized information (in both the hard copy and Internet version) together with a non-core of general purpose and customized information. Radical changes suggested by prior studies such as real-time reporting and disclosure of raw data will not occur, at least to the core package. Auditors will be reactive and cautious, and regulators will adopt a minimalist approach. The fundamental dilemma of financial reporting in the Internet environment will be between standardization and customization.

#### **5- Ge & McVay's Study (2005)**

##### **"The Disclosure of Material Weaknesses in Internal Control after the Sarbanes-Oxley Act"**

This paper focuses on a sample of 261 companies that disclosed at least one material weakness in internal control in their SEC filings after the effective date of the Sarbanes-Oxley Act of 2002. Based on the descriptive material weakness disclosures provided by management, we find that poor internal control is usually related to an insufficient commitment of resources for accounting controls. Material weaknesses in internal control tend to be related to deficient revenue-recognition policies, lack of segregation of duties, deficiencies in the period-end reporting process and accounting policies, and inappropriate account reconciliation. The most common account-specific material weaknesses occur in the current accrual accounts, such as the accounts receivable and inventory accounts. Material weakness disclosures by management also frequently describe internal control problems in complex accounts, such as the

derivative and income tax accounts. In our statistical analysis, we find that disclosing a material weakness is positively associated with business complexity (e.g., multiple segments and foreign currency), negatively associated with firm size (e.g., market capitalization), and negatively associated with firm profitability (e.g., return on assets).

#### **6- Bovee, M. et al. (2005)**

#### **“Financial Reporting and Auditing Agent with Net Knowledge (FRAANK) and extensible Business Reporting Language (XBRL)”**

This paper describes the development and applications of FRAANK—Financial Reporting and Auditing Agent with Net Knowledge. The prototype of FRAANK presented here provides automated access to, and understanding and integration of, rapidly changing financial information available from various sources on the Internet. In particular, FRAANK implements intelligent parsing to extract accounting numbers from natural-text financial statements available from the SEC EDGAR repository. FRAANK develops an “understanding” of the accounting numbers by means of matching the line-item labels to synonyms of tags in an XBRL taxonomy. As a result, FRAANK converts the consolidated balance sheet, income statement, and statement of cash flows into XBRL-tagged format. Based on FRAANK, we propose an empirical approach toward the evaluation and improvement of XBRL taxonomies and for identifying and justifying needs for specialized taxonomies by assessing a taxonomy fit to the historical data, i.e., the quarterly and annual EDGAR filings. Using a test set of 10 - K SEC filings, we evaluate FRAANK's performance by estimating its success rate in extracting and tagging the line items using the year 2000 C&I XBRL Taxonomy, Version 1. The evaluation results show that FRAANK is an advanced research prototype that can be useful in various practical applications. FRAANK also integrates the accounting numbers with other financial information publicly available on the Internet, such as timely stock quotes and analysts' forecasts of earnings, and calculates important financial ratios and other financial-analysis indicators



## **7- KPMG's Study (2005)**

### **"Assessing Internal Control over Financial Reporting: A Guide for Implementing"**

The purpose of this study is to provide an approach that management may consider for assessing, documenting, and reporting on Internal Control over Financial Reporting (ICOFR) in conformance with the requirements of the revised OMB Circular A-123, Management's Responsibility for Internal Control, Appendix A. The framework for the assessment is Standards for Internal Control in the Federal Government, issued by the U.S. Government Accountability Office (GAO) in November 19991 (and outlined in the Circular). These standards, frequently referred to as the "Green Book," are based on the Integrated Framework of Internal Control issued by the Committee of Sponsoring Organizations (COSO) of the Treadway Commission.

According to this study, management should tailor its approach based on the agency's specific policies, practices, and resources. However, if the assessment is to reflect the necessary rigor, and the Circular's and Appendix's objectives are to be met, certain elements in the approach should be carefully considered imperative.

## **8- Chen, M., C. Tseng, and J. Chang, (2005)**

### **"A Survey Investigation into the Use of the Internet among Accounting Firms"**

The research aims to explore the internet applications of accounting firms in Taiwan. Data were collected through questionnaire surveys of 595 CPA firms selected randomly from the registered list of the CPA Association of Taiwan, of which 73 out of 84 questionnaires returned were effective for analysis. How would accounting firms take advantage of the internet to enhance working effectiveness and efficiency, expanding business and assisting clients, are discussed in this paper.

The study found that the main reasons for accounting firms implementing the internet were for sharing internal resources, enforcing communication with clients and cost saving, while the major usage of internet was in database research, documenting and file transmission. Results of analysis about firms after applying the internet, whether internally or externally, were all positive. Differences in internet establishment and level of usage produced different effects on accounting firms.

**9- Krishnan, Jayanthi, (2005)**

**"Audit Committee Quality and Internal Control: an Empirical Analysis"**

This study examines the association between audit committee quality and the quality of corporate internal control. While information on the quality of internal control is not generally available, companies changing auditors are required to disclose any internal control problems that were pointed out by their predecessor auditors. The empirical results are based on a comparison of companies disclosing such internal control problems with a control sample of companies changing auditors but not disclosing internal control problems. Audit committee quality is measured in three dimensions: its size, its independence, and its expertise. The internal control problems are observed at two levels of increasing seriousness: reportable conditions and material weaknesses. The sample time period precedes the effective dates of recent policy changes regarding audit committees.

The results of the study indicated that independent audit committees and audit committees with financial expertise are significantly less likely to be associated with the incidence of internal control problems. This is true for both levels of internal control problems. The results are consistent with recent policy emphasis on audit committee independence and expertise.

**10- Noorvee's Study (2006)**

**"Evaluation of the Effectiveness of Internal Control over Financial Reporting"**

This study aims at evaluation of the effectiveness of internal control over financial reporting in Estonian companies. To assess the control components, a questionnaire is developed based on COSO internal control framework for small and medium-sized companies. In addition, interviews carried out with some companies.

This study revealed that the need of effective of internal control framework to help companies and organizations to achieve their objectives has grown during the last years. This study revealed, also, there are some weaknesses and some strengths regarding the effectiveness of internal control over financial reporting in the study sample.

The study recommended the companies to eliminate or reduction of the weaknesses detected during the study, and developing their strengths. It recommended, also, establishing an internal audit function within each company.

### **11- Bates, H. and B. Waldrup, (2006)**

#### **“The Effect of Teaching Technology on the Performance and Attitudes of Accounting Principles Students”**

The research question examined in this paper is whether PowerPoint presentations significantly increase student performance and attitudes in the principles of accounting course. The results display no significant statistical differences in either student performance or attitudes between those sections taught using PowerPoint and those taught using the traditional method. Improvements in computer technology and audio-video equipment have allowed accounting faculty to significantly change the way accounting information is delivered to students. Presentation software, such as PowerPoint, allows faculty to build well-designed slides that would be impossible with the traditional chalk, blackboard and overhead method.

### **12- Weidenmier and Ramamoorti’s Study (2006)**

#### **“Research Opportunities in Information Technology and Internal Auditing”**

This paper presents research opportunities in the area of information technology (IT) within the context of the internal audit function. Given the pervasive use of IT in organizations and the new requirements of the Sarbanes-Oxley Act of 2002, internal audit functions must use appropriate technology to increase their efficiency and effectiveness. We develop IT and internal audit research questions for three governance-related activities performed by the internal audit function-risk assessment, control assurance, and compliance assessment of security and privacy.

### **13- Doyle, Ge & McVay’s Study (2007a)**

#### **“Determinants of Weaknesses in Internal Control over Financial Reporting”**

This study examines determinants of weaknesses in internal control for 779 firms disclosing material weaknesses from August 2002 to 2005. The study finds that these firms tend to be smaller, younger, financially weaker, more complex, growing

rapidly, or undergoing restructuring. Firms with more serious entity-wide control problems are smaller, younger and weaker financially, while firms with less severe, account-specific problems are healthy financially but have complex, diversified, and rapidly changing operations.

This study revealed that the determinants vary based on the specific reason for the material weakness, consistent with each firm facing their own unique set of internal control challenges.

#### **14- Doyle, Ge & McVay's Study (2007b)**

##### **"Accruals Quality and Internal Control over Financial Reporting"**

This study examines the relation between accruals quality and internal controls using 705 firms that disclosed at least one material weakness from August 2002 to November 2005 and find that weaknesses are generally associated with poorly estimated accruals that are not realized as cash flows. Further, we find that this relation between weak internal controls and lower accruals quality is driven by weakness disclosures that relate to overall company-level controls, which may be more difficult to "audit around."

The study revealed that there is no such relation for more auditable, account-specific weaknesses.

The study results are robust to the inclusion of firm characteristics that proxy for difficulty in accrual estimation, known determinants of material weaknesses, and corrections for self-selection bias.

#### **15- Ling-fang's Study (2007)**

##### **"Influences and Countermeasures of Computerized Accounting on Modern Auditing"**

According to Ling-fang's study (2007), long with the popularization of computerized accounting in recent years, many companies no matter big or small have built their own computerized accounting system in China. This new accounting system is different from the traditional one, and the change will bring some influences and risks on the auditing. Therefore, it is urgent for auditors to take some countermeasures at present.

## **16- Hollis, Daniel, & William's Study (2007)**

### **"Accounting Information Systems"**

This study used internal control deficiency (ICD) disclosures prior to mandated internal control audits to investigate economic factors that expose firms to control failures and managements' incentives to discover and report control problems. It found that, relative to non-disclosers, firms disclosing ICDs have more complex operations, recent organizational changes, greater accounting risk, more auditor resignations and have fewer resources available for internal control. Regarding incentives to discover and report internal control problems, ICD firms have more prior SEC enforcement actions and financial restatements, are more likely to use a dominant audit firm, and have more concentrated institutional ownership.

## **17- Hoitash, Udi; Hoitash, Rani and Bedard, Jean C. (2009)**

### **"Corporate Governance and Internal Control over Financial Reporting: A Comparison of Regulatory Regimes"**

This study examines the association between corporate governance and disclosures of material weaknesses in internal control over financial reporting. It studied this association using material weaknesses reported under Sarbanes Oxley Sections 302 and 404, deriving data on audit committee financial expertise from automated parsing of member qualifications from their biographies.

The study found that a lower likelihood of disclosing Section 404 material weaknesses is associated with relatively more audit committee members having accounting and supervisory experience, as well as board strength. Further, the nature of material weaknesses varies with the type of experience. However, these associations are not detectable using Section 302 reports. It also found that material weaknesses disclosure is associated with designating a financial expert without accounting experience, or designating multiple financial experts. The study concluded that board and audit committee characteristics are associated with internal control quality. However, this association is only observable under the more stringent requirements of Section 404.

According to above-mentioned studies, we can find that each study covers one aspect or more of the impact of information technology on internal control of financial reporting, but not all aspects. In addition, we can find that there are positive and negative effects of information technology on internal control of financial reporting. However these effects either positive or negative are considered very important. Thus, it is necessary to manage these effects in order to rationalize the decision-making process for attaining the optimal exploitation of the available resources and achieving targets, especially under the current financial crisis. Therefore, the current study aims at explaining the impact of information technology on internal control of financial reporting, and how can **get benefits** of positives effects and avoid negative effects with application to the Kingdom of Saudi Arabia.

### **PART THREE: THE CONCEPTUAL OUTLINES OF THE STUDY**

In this part the researcher deals with the concepts and main subjects that related to his research, as follows:

#### **3.1- The Nature of Internal Control over Financial Reporting**

Internal controls are policies, plans, and procedures implemented by a firm to achieve three objectives: a) to ensure the efficiency and effectiveness of operations, b) to protect the assets of the organization, c) and to comply with applicable laws and regulations (see for example: Committee of Sponsoring Organizations of the Treadway Commission (COSO), 1992 & Hall 2001).

Internal controls are processes, affected by the Board of directors designed to provide reasonable assurance regarding the achievement of objective in the following categories (Kentucky Community and Technical College System [KCTCS], 2007):

- Effectiveness and efficiency of operations.
- Reliability of financial reporting.
- Compliance with applicable laws and regulations.

It should be noted that no system of internal controls is expected to eliminate all risks. Also, a strong system of internal controls does not ensure that the department's objectives will be met. Thus, the term "reasonable assurance" as noted in the definition of internal controls located above. However, it forms a solid

foundation in helping a department get where it wants to go, avoiding pitfalls and surprises along the way.

Prior to Sarbanes-Oxley, many studies such as Kinney and McDaniel (1989) examine characteristics of 73 firms that correct previously reported quarterly earnings from 1976 to 1985. The researchers posit that a restatement implies a breach in the firm's internal control system, and find that both firm size and firm profitability are negatively associated with these restatements in univariate tests. Moreover DeFond and Jiambalvo (1991) examine 41 firms with prior period adjustments from 1977 to 1988 and use firm size as a proxy for the strength of a firm's internal controls. While firm size is weakly negatively associated with prior period adjustments in univariate tests, they find that firm size is not a statistically significant variable in their multivariate regression analysis. However, McMullen et al. (1996) proxy for weak internal control with both SEC enforcement actions and corrections of previously reported earnings. Their focus is on whether weak internal control firms voluntarily report on internal control. They find that small firms with weak internal control are less likely than other small firms to provide voluntary reports on internal control.

The 2002 Sarbanes-Oxley Act requires managers to assess and attest to the internal financial controls and the IT controls within the firm. Therefore, assessing internal financial controls and IT controls has become an important and necessary task for auditors and management.

In the midst of rising concerns about accounting scandals, the 2002 Sarbanes-Oxley Act section 404 requires management to assess and attest to the effectiveness and completeness of the internal control structure. Specifically, Section 404 of SOX requires management to assess and attest to their organization's internal controls over financial reporting in an internal control report that is filed with the annual report. Furthermore, this law makes managers personally liable for the internal control structure within the firm. This act's section also requires that the external auditors report on management's internal control assessment.

Internal control over financial reporting is defined as a process designed by, or under the supervision of the entity's principal executive and principal financial officers, or persons performing similar functions, and effected by the entity's governing board, management and other personnel, to provide reasonable assurance

regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles (GAAP) and includes those policies and procedures that (Montana Operations Manual (MOM), 2007):

- Pertain to the maintenance of records that in reasonable detail accurately and fairly reflect the transactions and dispositions of the assets of the entity;
- Provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the entity are being made only in accordance with authorizations of management and directors of the entity; and
- Provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of the entity's assets that could have a material effect on the financial statements

According to (Montana Operations Manual (MOM), 2007), this definition reflects certain fundamental concepts:

- Internal control is a process. It is a means to an end, not an end in itself.
- People are what make internal control work. Internal control is not just the policies and procedures contained in an accounting manual. Personnel play an important role in making internal control happen.
- No matter how well designed and operated, internal control can provide only reasonable (not absolute) assurance that all agency objectives will be met.

When designing and implementing internal control activities, managers should consider the following four basic principles (Montana Operations Manual (MOM), 2007):

- Internal control should benefit, rather than hinder, the organization. Internal control policies and procedures are not intended to limit or interfere with an agency's duly granted authority related to legislation, rule-making or other discretionary policy-making.
- Internal control should make sense within each agency's unique operating environment.



- Internal control is not a set of stand-alone practices. Internal control is woven into the day-to-day responsibilities of managers and their staff.
- Internal control should be cost effective.

Internal control is not a separate, static system. Instead, it should be viewed as a continuous series of actions and activities that are interwoven throughout an entity's operations. In a sense, internal control is management control built into the entity as part of its infrastructure to help managers run the entity and achieve their goals on an ongoing basis.

In its Auditing Standard 2 (AS 2), the Public Company Accounting Oversight Board (PCAOB) defined Internal Control over Financial Reporting (ICOFR) as: "a process designed by management to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements in accordance with GAAP". ICOFR is a subset of internal control specific to financial reporting objectives. It does not encompass the elements that relate to the effectiveness and efficiency of a company's operations or a company's compliance with applicable laws and regulations, with the exception of compliance with the applicable laws and regulations directly related to the preparation of financial statements (PCAOB, Auditing Standard No. 2, 2004).

The PCAOB's definition requires ICOFR to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements. Reasonable assurance represents a high level of assurance, but it is not absolute. It recognizes that, even when ICOFR is effective, misstatements may occur, being neither prevented nor detected on a timely basis.

In deciding whether the ICOFR is effective, Auditing Standard 2 requires that a company's management and its independent auditor consider the likelihood and magnitude of a potential misstatement.

The PCAOB requires that management and auditors base their assessment of the effectiveness of the company's ICOFR on a suitable, recognized control framework. AS 2's performance and reporting directions are based on the 1992 framework published by the Committee of Sponsoring Organizations (COSO) of the Tread way Commission, "Internal Control—Integrated Framework." Most companies

have adopted the COSO internal control framework as a basis for their assessment of ICOFR; however, many companies are using the Control Objectives for Information and Related Technology (COBIT) framework as the basis for assessing control for their information system management.

If a material weakness in ICOFR exists, management and the auditor must conclude that ICOFR is not effective. All identified material weaknesses that exist at year-end must be disclosed in the reports on ICOFR. Deficiencies that are less than material weaknesses are required to be disclosed to the audit committee or the board of directors, and management may disclose them in its report on ICOFR.

The SEC requires management to disclose the following information in its report on ICOFR (SEC, 2003):

- A statement of management's responsibility for establishing and maintaining adequate ICOFR;
- A statement identifying the framework used by management to evaluate the effectiveness of ICOFR;
- Management's assessment of the effectiveness of the company's ICOFR as of the end of its most recent fiscal year, including an explicit statement as to whether that control is effective, and disclosure of any material weakness identified;
- A statement that the registered public accounting firm that audited the financial statements has also issued an attestation report on management's internal control assessment.

On the other hand, if the auditor found material weakness in ICOFR and management did not, the auditor must issue an adverse opinion on management's assessment of the effectiveness of ICOFR.

The auditor must also report on its independent assessment of the effectiveness on ICOFR. The auditor may issue one of three opinions, depending on this assessment:

- An unqualified opinion on the assessment of the effectiveness of ICOFR if there were no material weaknesses in ICOFR, or ICOFR was effective;
- An adverse opinion on the assessment of the effectiveness of ICOFR if there are one or more material weaknesses in ICOFR; or

- A disclaimer if management has in any way restricted the auditor's scope of work needed to assess the effectiveness of ICOFR.

The auditor's report on the audit of internal control over financial reporting must include the following elements (The PCAOB, 2007)

- A title that includes the word independent ;
- A statement that management is responsible for maintaining effective internal control over financial reporting and for assessing the effectiveness of internal control over financial reporting;
- An identification of management's report on internal control;
- A statement that the auditor's responsibility is to express an opinion on the company's internal control over financial reporting based on his or her audit;
- A definition of internal control over financial reporting as stated in paragraph A5;
- A statement that the audit was conducted in accordance with the standards of the Public Company Accounting Oversight Board (United States);
- A statement that the standards of the Public Company Accounting Oversight Board require that the auditor plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects;
- A statement that an audit includes obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as the auditor considered necessary in the circumstances;
- A statement that the auditor believes the audit provides a reasonable basis for his or her opinion;
- A paragraph stating that, because of inherent limitations, internal control over financial reporting may not prevent or detect

misstatements and that projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate;

- The auditor's opinion on whether the company maintained, in all material respects, effective internal control over financial reporting as of the specified date, based on the control criteria;
- The manual or printed signature of the auditor's firm;
- The city and state (or city and country, in the case of non-U.S. auditors) from which the auditor's report has been issued; and
- The date of the audit report.

### **3.2- The Effect of Information Technology on Internal Control**

First of all, there are many definitions of internal control, as it affects the various constituencies (stakeholders) of an organization in various ways and at different levels of aggregation. COSO defines internal control as, "a process, influenced by an entity's board of directors, management, and other personnel, that is designed to provide reasonable assurance in the effectiveness and efficiency of operations, reliability of financial reporting, and the compliance of applicable laws and regulations" <http://www.mmb.state.mn.us/coso-definitions>. The auditor evaluates the organization's control structure by understanding the organization's five interrelated control components. They include (<http://coso.org/documents/Internal%20Control-Integrated%20Framework.pdf>)

- Control Environment Provides the foundation for the other components. Encompasses such factors as management's philosophy and operating style.
- Risk Assessment Consists of risk identification and analysis.
- Control Activities Consists of the policies and procedures that ensure employees carry out management's directions. Types of control activities an organization must implement are preventative controls (controls intended to stop an error from occurring), detective controls (controls intended to detect if an error has occurred), and mitigating controls (control activities that can mitigate the risks associated with a key control not operating effectively).

- Information and Communication Ensures the organization obtains pertinent information, and then communicates it throughout the organization.
- Monitoring and reviewing the output generated by control activities and conducting special evaluations.

In addition to understanding the organization's control components, you must also evaluate the organization's General and Application controls. There are three audit risk components which are control risk, detection risk and inherent risk.

The use of IT affects the fundamental manner in which transactions are initiated, recorded, processed, and reported. In a manual accounting Information systems (AIS), a corporation uses manual procedures to record transactions in a paper format. Internal controls are also manual and may include such procedures as approvals and reviews of activities, reconciliations and follow-up of reconciling items.

Alternatively, computerized AIS use automated procedures to initiate, record, process and report transactions. As a result, records are stored in electronic formats that may replace paper documents. Controls for computerized AIS generally consist of a combination of automated controls (e.g., controls embedded in the computer programs) and manual controls. The manual controls may be independent of IT; they may use information produced by IT; or they may be limited to monitoring the information systems and automated controls and handling exceptions. The mix of manual and automated controls will vary with the nature and complexity of a corporation's use of IT American Institute of Certified Public Accountants (AICPA), 1990).

Controls under IT are specific activities performed by persons or systems designed to ensure that business objectives are met. They are a subset of an enterprise's internal control. Its objectives relate to the confidentiality, integrity, and availability of data and the overall management of the IT function of the business enterprise. These controls are often described in two categories: IT general controls and IT application controls. The first category includes controls over the IT environment, computer operations, access to programs and data, program development and program changes. Whereas, the second category refers to transaction processing controls, sometimes called "input-processing-output" controls. IT controls

have been given increased prominence in corporations listed in the United States by the Sarbanes-Oxley Act. The Framework of Control Objectives for Information Technology is a widely used framework promulgated by the IT Governance Institute, which defines a variety of IT general controls and It application control objectives and recommended evaluation approaches. IT departments in corporations are often led by a Chief Information Officer, who is responsible for ensuring effective information technology controls are utilized (the Sarbanes-Oxley Act of 2002, 2002).

### **3.3- Internal Control over Financial Reporting under IT**

SOX requires the chief executive and chief financial officers of public companies to attest to the accuracy of financial reports (Section 302) and require public companies to establish adequate internal controls over financial reporting (Section 404). Passage of SOX resulted in an increased focus on IT controls, as these support financial processing and therefore fall into the scope of management's assessment of internal control under Section 404 of SOX (Sarbanes-Oxley Section 404, 2004).

The control objectives for IT framework may be used to assist with SOX compliance, although the control objectives for IT are considerably wider in scope. The 2007 SOX guidance from the Public Company Accounting Oversight Board (PCAOB) [http://en.wikipedia.org/wiki/Information\\_technology\\_controls](http://en.wikipedia.org/wiki/Information_technology_controls) - cite note-0 and Securities and Exchange Commission (SEC) state that IT controls should only be part of the SOX 404 assessment to the extent that specific financial risks are addressed, which significantly reduces the scope of IT controls required in the assessment. This scoping decision is part of the entity's SOX 404 top-down risk assessment (PCAOB, Auditing Standard No. 5, 2007 & SEC, 2007). In addition, Statements on Auditing Standards No. 109 (AICPA, SAS109, 2006) discusses the IT risks and control objectives pertinent to a financial audit and is referenced by the SOX guidance.

IT controls that typically fall under the scope of a SOX 404 assessment may include (Sarbanes-Oxley Section 404, 2004):

- Specific application (transaction processing) control procedures that directly mitigate identified financial reporting risks. There are typically

a few such controls within major applications in each financial process, such as accounts payable, payroll, general ledger, etc. The focus is on "key" controls (those that specifically address risks), not on the entire application.

- IT general controls that support the assertions that programs function as intended and that key financial reports are reliable, primarily change control and security controls;
- IT operations controls, which ensure that problems with processing are identified and corrected.

Specific activities that may occur to support the assessment of the key controls above include (Sarbanes-Oxley Section 404, 2004):

- ✓ Understanding the organization's internal control program and its financial reporting processes.
- ✓ Identifying the IT systems involved in the initiation, authorization, processing, summarization and reporting of financial data;
- ✓ Identifying the key controls that address specific financial risks;
- ✓ Designing and implementing controls designed to mitigate the identified risks and monitoring them for continued effectiveness;
- ✓ Documenting and testing IT controls;
- ✓ Ensuring that IT controls are updated and changed, as necessary, to correspond with changes in internal control or financial reporting processes; and
- ✓ Monitoring IT controls for effective operation over time.

To comply with Sarbanes-Oxley, corporations must understand how the financial reporting process works and must be able to identify the areas where technology plays a critical part. In considering which controls to include in the program, corporations should recognize that IT controls can have a direct or indirect impact on the financial reporting process. For instance, IT application controls that ensure completeness of transactions can be directly related to financial assertions. Access controls, on the other hand, exist within these applications or within their supporting systems, such as databases, networks and operating systems, are equally important, but do not directly align to a financial assertion. Application controls are

generally aligned with a business process that gives rise to financial reports. While there are many IT systems operating within corporations, Sarbanes-Oxley compliance only focuses on those that are associated with a significant account or related business process and mitigate specific material financial risks. This focus on risk enables management to significantly reduce the scope of IT general control testing in 2007 relative to prior years.

## **PART FOUR: THE EMPIRICAL STUDY**

### **1- Introduction:**

This part explains the methodology and procedures used in conducting the empirical part of the study, achieving its objectives. As mentioned in Part I, this study aims to achieve two main objectives as follows:

- **The first objective** is concerned with explaining the positives and negatives effects of IT on internal control over financial reporting in corporations generally.
- **The second objective** is concerned with explaining how can get benefits of positives effects and avoid negative effects of IT on internal control over financial reporting in corporations generally, and in Saudi listed companies particularly.

For achieving these objectives, this study is trying to answer the following questions:

A. What are the **positives and negatives** effects of IT on internal control over financial reporting in Saudi listed companies?

B. How can **get benefits** of positives effects and avoid negative effects of IT on internal control over financial reporting in Saudi listed companies?

The researcher chose to carry out questionnaires with some employees from Saudi listed companies in Riyadh city only, because the headquarters of banks are in Riyadh city.

The questionnaire in this study consisted of four sections. **Section One** aimed to collect general information about the respondents, such as their names, their positions, and their qualifications (education and experiences). This section was divided into four items. **Section two** aimed to determine the dimensions of applied information technology in Saudi listed companies. This section was divided into four



items. **Section three** aimed to determine the dimensions of internal control over financial reporting system in Saudi listed companies. This section was divided into four items. **Section Four** aimed to determine the relationship between internal control of financial reporting system and information technology in Saudi listed companies. This section was divided into four items. Regarding the questionnaire layout (see The Research Appendix).

To measure the validity of the research instrument used in this study and confirm clarity of the items and their relevance to their scales and sections, the following steps were undertaken:

- ◆ Copies of questionnaire were distributed to twelve of the teaching staff in King Saud University, most of them Egyptians.
- ◆ A letter was given to these twelve assessors indicating the nature and the aim of the questionnaire and telling them that they were not asked to respond to the items, but to judge whether or not the items met the necessary criteria.

## **2- Presenting of the Survey Results:**

Frequency distributions and qualitative analysis are used to describe the respondents and the outcomes of study with them, as follows:

### **2-1- General Information:**

According to the collected data, the majority of respondents have got a Bachelor's Degree in Business Administration (in the field of accounting). One of the respondents has got a B.S Chemical engineering. Four of respondents, representing nearly 10% of the sample (42), have got higher studies (Masters Degree in the field of accounting or MBA). A number of respondents have also got professional certificates, such as qualifications CA (UK) ACA (Canada) CIA (USA) CISA (USA), CPA (USA), SOCPA (KSA), CMA, FRM, and CFA. In addition, some respondents work as a Senior Internal Auditor, and other work as a Manager of Internal Auditing. This means that all respondents work in the field of accounting and finance and might be expected to be knowledgeable about the study topic, through their qualifications and experience in the field of the current study. One of the respondents is Fellow Member of the Institute of Chartered Accountant of Pakistan.

Regarding the number of experiences years in the field of accounting and auditing, around 82% of respondents have experiences from 5 to less 10 years. 16 % of respondents have experiences more than 10 years and 2% of respondents have experiences less than 5 years. This reflects that the majority of respondents works and has a good experience in the field of the current study.

## **2-2- The Dimensions of Applied Information Technology:**

According to the collected data, some respondents (around 17%) mentioned that they have SAP system as a financial reporting system, whereas some respondents (around 40%) mentioned that they have Oracle system as a financial reporting system, and these systems applied since more than 5 years. In addition, the majority of respondent update their systems every 5 years. However, some respondents (around 43%) mentioned that they have computerized system with different applications.

## **2-3- The Dimensions of Internal Control over Your Financial Reporting System**

According to the collected data, the majority of respondents mentioned that the computer processing directly related to the timely production of financial reports ... Whereas, some of them mentioned that the computer processing indirectly related to the timely production of financial reports. The majority of respondents mentioned that there no known significant deficiencies or material weaknesses where a technology solution is pending. According to some respondents, the main dimensions of internal control over financial reporting system include:

- Manual Preventive Controls
- Automated Preventive Controls
- Manual Detective Controls
- Automated Detective Controls

According to other respondents, the main dimensions of internal control over financial reporting system include:

- System Access control
- Build-In Internal control Checks
- Security checks
- Integration with Risk Assessment

- Policies and Procedures
- Authorities and Responsibilities
- Management Philosophy and Operating Style

## **2-4- The Relationship between Internal Control of Your Financial Reporting System and Information Technology**

All respondents mentioned that there are positive and negative effects of internal control of your financial reporting system under new information technology.

Positive effects include (according to some respondents):

- Error free Automated Controls Applied Consistently without fail
- Continuous Controls

Whereas, negative effects include (according to the respondents):

- ◆ Entry of additional data mandated by input forms
- ◆ Difficult to change system parameters

However, they mentioned that they can you get benefits of positives effects of IT on internal control over financial reporting by:

- Using the results of these automated controls.
- Removing duplicated legacy manual controls due to implementation of automated controls.

In addition they mentioned that they avoid negative effects of IT on internal control over financial reporting by:

- ◆ Educate data entry folks about the benefits of entry of additional data in ERP systems
- ◆ Conduct through system testing during implementation to ensure parameters are appropriate for the organization so that parameter changes will be needed very rarely.

To avoid negative effects of IT on internal control over financial reporting some respondent mentioned by:

- i) Restricted access of systems as per the delegated authority matrix through system build access control.
- ii) Logging Unauthorized system access Attempts and reporting to the appropriate authority.

iii) From the data prospect, following are some control, which may be build-in using positive effects of IT

- ✓ Completeness checks - controls that ensure all records were processed from initiation to completion.
  - ✓ Validity checks - controls that ensure only valid data is input or processed.
  - ✓ Identification - controls that ensure all users are uniquely and irrefutably identified.
  - ✓ Authentication - controls that provide an authentication mechanism in the application system.
  - ✓ Authorization - controls that ensure only approved business users have access to the application system.
  - ✓ Input controls - controls that ensure data integrity fed from upstream sources into the application system.
- iv) Public availability of the financial statements needs to be controlled through system based time management systems for FA-Issue by appropriate authority.
- v) five components of internal control: control environment, risk assessment, control activities, information and communication and monitoring, should be in place to achieve financial reporting and disclosure objectives

The majority of respondents agreed with that the complexity of the IT environment has a significant effect on the risks of misstatement and the controls implemented to address those risks. They also agreed with the use of IT leads to positives effects more than negative effects on internal control over financial reporting. However, all respondent agreed with that all sensitive information should protect by operators ID/ Password.

On the other hand, the majority of respondents agreed with that the company is dependent on user-developed applications, which are used to initiate, authorize, record, process, and report the results of business operations. They also disagreed with that Computer systems tend to be centralized in a single location, and there are a limited number of interfaces between systems.

However, the majority of respondents were neutral with t hat Data inputs can be readily compared or reconciled to system outputs. They also were neutral with that the company typically uses the packaged software without programming modification.

### 3- Discussion of Survey Results

After presentation of the data collected by questionnaires, it is necessary to analyze these data, to discuss the results. Thus, this section will discuss the findings of the survey, focusing particularly on the relationship between internal control over financial reporting system and information technology in corporations in the Kingdom of Saudi Arabia.

As set out in this part, all corporations in corporations in the Kingdom of Saudi Arabia use IT, and this usage has several effects on their internal control over financial reporting system. Some of these effects are positive, such as: IT supports internal control over financial reporting system, and it helps to avoid errors and mistakes. In addition, under IT, internal control over financial reporting system became more effective. Hence, IT helps attaining the optimum exploitation of the available resources for achieving organizational targets.

On the other hand, there some negative effects, such as: there are some difficult to change system parameters and to update current systems for using new technologies. In addition, new technology will cost corporations a lot, because it needs special skills, hardware and software. Hence, under IT, internal control over financial reporting system needs more monitoring and maintenance.

This means that the first research question that related to what are the positives and negatives effects of IT on internal control over financial reporting in corporations in the Kingdom of Saudi Arabia companies has been done.

However, getting benefits of positives effects of IT on internal control over financial reporting can be done by using IT in the field of internal control over financial reporting effectively. In addition, it is necessary removing duplicated legacy manual controls due to implementation of automated controls.

On the other hand, avoiding negative effects of IT on internal control over financial reporting can be done by using restricted access of systems. In addition, it is necessary to make reduction in the cost that related to using IT on internal control over financial reporting.

This means that the first research question that related to how can get benefits of positives effects and avoid negative effects of IT on internal control over financial reporting in corporations in the Kingdom of Saudi Arabia has been done.

## **PART FIVE: CONCLUSION AND RECOMMENDATIONS:**

### **5-1- Summary:**

The core of this paper has involved an examination of the relationship between IT on internal control over financial reporting with application to corporation in the Kingdom of Saudi Arabia.

This research aimed at achieves two main objectives as follows:

- **The first objective** is concerned with explaining the positives and negatives effects of IT on internal control over financial reporting in corporations generally.
- **The second objective** is concerned with explaining how can get benefits of positives effects and avoid negative effects of IT on internal control over financial reporting in corporations generally, and in Saudi listed companies particularly.

For achieving these objectives, this paper divided into five parts, as follows:

**Part I** stated the general framework of the study, the research problem, its questions, its objectives and importance, and its methodology. The structure of the research was also presented.

In **Part II**, the researcher presented some of the previous studies that related to the research topic.

In **Part III**, the conceptual outline of the study was shown. The review covered the nature of internal control over financial reporting, the effect of information technology (IT) on internal control, and the internal control over financial reporting under IT.

In **Part IV**, the researcher explained the methodology applied in his empirical work. He stated the research approach and the research instrument. Validity of the research instrument, and the study sample was presented. The administration of the research instrument (questionnaire) in the main study was presented. The data analysis procedure used was also explained in this part. The data collected by questionnaires were presented, analyzed and discussed.

In **Part V**, research summary, conclusions, recommendations, and recommendations for further research were presented.

## **5-2- Conclusions:**

The conclusions of this research include:

- IT supports internal control over financial reporting system, and it helps to avoid errors and mistakes.
- Under IT, internal control over financial reporting system became more effective. Hence, IT helps attaining the optimum exploitation of the available resources for achieving organizational targets.
- Under IT, there are some difficult to change system parameters and to update current systems for using new technologies.
- New technology will cost corporations a lot, because it needs special skills, hardware and software. Hence, under IT, internal control over financial reporting system needs more monitoring and maintenance.

## **5-3- Recommendations:**

The recommendations of this research are as follows:

- For getting benefits of positives effects of IT on internal control over financial reporting, it is necessary to use IT in the field of internal control over financial reporting effectively.
- For getting benefits of positives effects of IT on internal control over financial reporting, it is necessary removing duplicated legacy manual controls due to implementation of automated controls.
- For avoiding negative effects of IT on internal control over financial reporting it is necessary using restricted access of systems.
- For avoiding negative effects of IT on internal control over financial reporting, it is necessary to make reduction in the cost that related to using IT.

## **5-4- Recommendations for Further Research:**

A number of topics merit further investigation. These include:

- The Impact of Information Technology on Internal Control over Financial Reporting under international standards: a comparison study.

- A proposed approach for getting benefits of positives effects and avoiding negative effects of IT on internal control over financial reporting.

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# **The Research Appendix**

## **Questionnaire for**

### **Studying the Impact of Information Technology on Internal Control over Financial Reporting in Corporations in the Kingdom of Saudi Arabia**

**Dear Sir**

My research is focused on analyzing and explaining the positives and negatives effects of information technology on the internal control over financial reporting in corporations in the Kingdom of Saudi Arabia. I would be very grateful if you could participate in this questionnaire (or other persons who may be related to financial reporting processes in your company). It will take 10-15 minutes to complete.

Your response will be treated with complete confidentiality and will be used only for academic research purposes.

Finally, I would like to take this opportunity to thank you for spending your valuable time in answering the questions in this survey, and for your professional opinions and suggestions.

Sincerely  
Dr Saleh H. Alshinifi  
Chairman of the accounting Department  
College of Business Administration  
King Saud University

**Part (A). General Information:**

1- Name (Optional) -----

2- Position -----

3- Academic qualifications -----  
-----  
-----

4- Number of experiences years in the field of accounting, business and finance  
Less than 5 years  From 5 to less than 10 years  More than 10 years

**Part (B): The Dimensions of Applied Information Technology:**

1- What is the nature of your financial reporting system?

- Computerized system with different applications
- Integrated system, such as Oracle, SAP, ... so on
- Other system, please specify .....

2- For how long you apply your current system?  
Less than 3 years  From 3 to less than 5 years  More than 5 years

3- Do you update your current system?

- Yes
- No

4- If yes, how many times do you update your current system?  
annually  every 3 years  every 5 years

**Part (C): The Dimensions of Internal Control over Your Financial Reporting System:**

1- Is the computer processing directly related to the timely production of financial reports??

- Yes
- No

2- Is the computer processing indirectly related to the timely production of financial reports??

- Yes
- No

3- Are there known significant deficiencies or material weaknesses where a technology solution is pending??

- Yes
- No

4- What is the main the dimensions of your internal control over your financial reporting system?

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.....  
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.....  
.....  
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.....

**Part (D): The Relationship between Internal Control of Your Financial Reporting System and Information Technology:**

1- Are there any positive effects of internal control of your financial reporting system under new information technology?

- Yes
- No

- If yes, please specify

.....  
.....  
.....  
.....

2- Are there any negative effects of internal control of your financial reporting System under new information technology?

- Yes
- No

- If yes, please specify

.....  
.....  
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3- How can get benefits of positives effects and avoid negative effects of IT on internal control over financial reporting in corporations?

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4- To what extent do you agree with the following? (Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D) and Strongly Disagree (SD))

SD	D	N	A	SA	Statement
					a- Data inputs can be readily compared or reconciled to system outputs
					b- The company typically uses the packaged software without programming modification
					c- The company is dependent on user-developed applications, which are used to initiate, authorize, record, process, and report the results of business operations
					d- Computer systems tend to be centralized in a single location, and there are a limited number of interfaces between systems
					e- The complexity of the IT environment has a significant effect on the risks of misstatement and the controls implemented to address those risks
					f- All sensitive information should protect by operators ID/ Password.
					g- The use of IT leads to positives effects more than negative effects on internal control over financial reporting.