

The Comparative Analysis of the Internal Control According to Economic Changes in Korean Companies

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Abstract

Prior to the 2000s, internal control had not been among the high priority issues in the management's agenda. Since then, however, it has become one of the hottest issues, and has received a significant attention as the means of improving the transparency, sustainability, and competitiveness of a company.

The objectives of this paper are to examine if there has been any noticeable changes in the level of internal controls of Korean companies before and after the 2010, and to analyze the underlying drivers and issues thereto.

Accounting manipulation and moral hazard were among the factors to cause the Korean financial crisis in 1997 and 2008. Since then, the capital market has had a strong pressure on Korean companies to enhance the transparency of management and accounting while the government has made the laws, requirements, and recommendations to alleviate the moral hazard problems of management and enhance the accounting transparency. Both market and government have driven companies to put more priority on the reliability of financial reporting and the compliance of applicable laws and regulations. Thereby, the market and governmental forces has led companies to enhance the level of internal controls which contribute to the reliability of financial reporting and the compliance

The pressure on companies to enhance the level of internal controls may be different across industries. The capital market and government experiencing the severe financial crisis in 1997 and 2008 put even more pressure on financial companies such as banks to upgrade the reliability of financial reporting and the compliance of regulations to the global level than on non-financial companies.

A survey is performed on the changes in the level of internal controls of 54 major companies consisting of 10 financial and 44 non-financial companies in Korea. The survey results show that the average level of internal controls of Korean companies has noticeably improved and that the change in the level of control environment factor is higher than that of IT control factor. The analysis on the industry differences shows that financial companies increased the level of control environment factor more than non-financial companies did while non-financial companies upgraded the level of IT control factor more than financial companies did relatively.

Among internal control categories, the most improved area since the economic crisis is "Risk Assessment." The global best practices for risk management have been developed primarily in the financial industry and then spread to other industries. The general level of control practices of Korean companies has been improving significantly, but still appears below the global advanced practices.

Keywords : Internal Controls, IT Control, Audit, Risk Assessment

1. Introduction

Since the Korea economic crisis in 1997, there have been significant changes not only in the business environment including the industry structure but also in the manner of doing business of the individual company. Prior to the 2000s, internal control had not been among the high priority issues in the management's agenda. Since then, however, it has become one of the hottest issues, and has received a significant attention as the means of improving the transparency, sustainability, and competitiveness of a company.

The Korean government has been making the laws and regulations similar to the Sarbanes-Oxley Act in the US, which requires CEOs and CFOs to certify the effectiveness of internal controls as well as the fairness of financial statements. The Internal control, in its broader definition as defined by the COSO (Committee of Sponsoring Organization) report, includes corporate governance, risk management, control activities, disclosure control and procedures, and internal audit, etc [Committee of Sponsoring Organizations of Treadway Commission, 2011].

Accounting manipulation and moral hazard were among the factors to cause the Korean financial crisis in 1997 and 2008. Since then, the capital market has had a strong pressure on Korean companies to enhance the transparency of management and accounting while the government has made the laws, requirements, and recommendations to alleviate the moral hazard problems of management and enhance the accounting transparency. Both market and government have driven companies to put more

priority on the reliability of financial reporting and the compliance of applicable laws and regulations. Thereby, the market and governmental forces has led companies to enhance the level of internal controls which contribute to the reliability of financial reporting and the compliance with laws. It is expected that the companies have put more efforts to enhance the level of control factors which are directly related to the control objectives with high priority.

The pressure on companies to enhance the level of internal controls may be different across industries. The capital market and government experiencing the severe financial crisis in 1997 and 2008 put even more pressure on financial companies such as banks to upgrade the reliability of financial reporting and the compliance with regulations to the global level than on non-financial companies. Therefore, it is expected and will be examined that the market and governmental forces have driven financial companies to enhance the level of control environment factor more than non-financial companies.

We developed a model consisting of external driving forces, control objectives, and internal control. The market, governmental, and corporate forces drive companies to adjust the priority of control objectives. The higher the priority of each objective becomes, the higher the improvement of the internal control factor which contributes directly to achieve the objective.

The objectives of this paper are to examine if there has been any noticeable changes in the level of internal controls of Korean companies in before and after the 2010, and to analyze the underlying drivers and issues thereto.

We develop a measurement model to assess the level of internal control of the individual company. Using this model, a survey is performed on the changes in the level of internal controls of 54 major companies in Korea.

In section 2, the model explaining the driving forces, control objectives, and internal control is presented. Then, the internal control assessment model is presented with the survey methods and data collection. Section 3 describes the implications of survey findings and analysis on the changes in the internal control. The conclusion follows in Section 4.

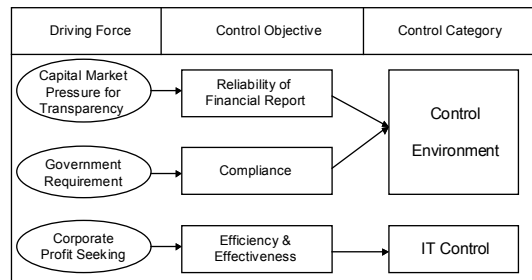
2. Research Model and Method

2.1 Internal Control Model

Accounting manipulation and moral hazard were among the factors which lead to the Korean financial crisis in 1997 and 2008. Since then, the capital market has had a strong pressure on companies to enhance the transparency of management and accounting while the government has made the laws, requirements, and recommendations to alleviate the moral hazard problems of management and enhance the accounting transparency. Both market and government have driven companies to put more priority on the reliability of financial reporting and the compliance of applicable laws and regulations rather than on the effectiveness and efficiency which are driven by the corporate profit-seeking goal. The control environment contributes directly to enhance the reliability of financial reporting and the compliance of laws while the IT control is more likely to increase the effectiveness and

efficiency of operations.

We developed a model consisting of driving forces, control objectives, and internal control factors as shown in <Figure 1>. The market, governmental, and corporate forces drive the adjustment of the priority of three control objectives. The higher the priority of each objective becomes, the higher the improvement of the internal control factor which contributes directly to achieve the objective



<Figure 1> Internal Control Model

It is expected and will be empirically tested that the market and governmental forces initiated by the economic crisis have led companies to focus on the reliability and compliance more than the effectiveness and efficiency, therefore put more efforts to strengthen the level of control environment factor than that of IT control factor.

In general, financial companies such as banks are expected to have stronger internal controls than non-financial companies do. The capital market and government facing the financial shock in 1997 and 2008 have put more pressure on financial companies to upgrade the reliability of financial reporting and the compliance of laws to the level of the global standard than on non-financial companies. Therefore, the market and governmental forces are expected to have driven

financial companies to enhance the level of control environment factor more than non-financial companies. We will investigate whether there are industry differences and compare the levels and changes in internal control between financial and non-financial companies empirically.

2.2 Internal Control Assessment Model

Internal controls have been developed to improve the reliability of transaction processes. The definition and concept of internal control have been modified as the business environment has changed. In the US, internal controls as previously defined under a manual working environment were modified by the Statement on Auditing Standards (SAS) No.55 in 1986 as the working environment became computerized [Hitzig and Jacoby, 1995]. Subsequently in 2011, the COSO of the Treadway Commission issued a report named "Internal Control - Integrated Framework", which defined internal control and its components in a broader and more comprehensive perspective.

According to the COSO report, internal control is defined as a process, effected by an entity's board of directors and management, designed to provide reasonable assurance regarding the achievement of control objectives in (1) the effectiveness and efficiency of operations, (2) the reliability of financial reporting and (3) the compliance of applicable laws and regulations. According to this broad definition, internal control is the infrastructure, which determines the competitiveness and sustainability of an organization [Committee of Sponsoring Organiz-

ations of Treadway Commission, 2011; International Standard on Auditing, 1991].

Internal control consists of five interrelated components such as control environment, risk assessment, control activities, information and communication, and monitoring. The control environment is a function of the governance structure, integrity and competence of an organization's people, senior management's operating style and philosophy, and the extent to which employees understand they will be held accountable for their actions [Cadbury, 1999; Leech, 1997]. Risk assessment is the identification and analysis of risks as related to the achievement of objectives. Control activities ensure that necessary actions are taken to address risks. There are a variety of specific control activities which employees perform every day. Under IT environment, control activities are classified into general computer control and application control. Major aspects of information and communication include information systems, communication of control responsibilities, organizational communication, and external communication [Weber, 1999]. Monitoring control is the ongoing process to ensure internal controls are functioning as intended.

In selecting the factors to evaluate the level of internal control in this study, the following approaches are adopted:

First, the control factors to be evaluated are considered according to the SAS No. 55, 78, and 94, Consideration of the Internal Control Structure in a Financial Statement Audit, which is based on the COSO framework [Colbert and Bowen, 1996].

Second, the checklists currently used in practice by auditors for the assessment of the level of control risk are reviewed, for which the PwC TeamAsset version of year 2011 is referred as audit quality inspection [PricewaterhouseCoopers LLP, 2011].

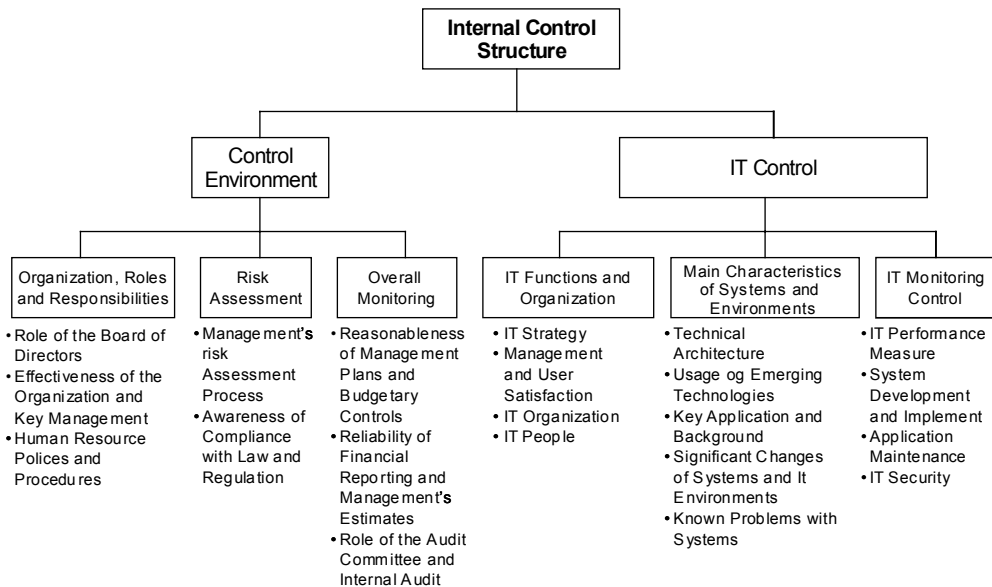
Third, the experts who have engaged in auditing practices for more than 10 years are interviewed and their opinions are additionally considered, especially to determine the weight of each factor category in assessing the level of internal control [Leech, 1997].

Based on the above approaches, the internal control factors are identified into two groups, "Control Environment Factor" and "IT Control Factor."

The control environment represents the control atmosphere for the entity and is the foundation for other components. It consists of three control categories which are "Organization, Roles, and

Responsibilities", "Risk Management", and "Overall Monitoring". On the other hand, the IT control factor includes those which determine the general conditions for individual application control and general computer control [Kuong, 1996; Leonard, 1997]. It consists of three control categories such as "IT Functions and Organization", "Characteristics of Systems and Environment", and "IT Monitoring control."

These six control categories are further broken down into 22 control factors and then into 50 questions, which employ a 5 point scale evaluation, where point 1 implies the level of local lagging practice, 2 implies the level of local average practice, 3 implies the level of the current local advanced practice, 4 implies the level of the current global advanced practice, and 5 implies the level of the ideal global best practice. <Figure 2> shows the structure of the 22 factors to evaluate the level of control in this study.



<Figure 2> Internal Control Assessment Model

2.3 Data Collection

We sent out questionnaires to 60 major companies in Korea, and received 54 replies, which can be categorized as 10 companies in financial industry and 44 non-financial companies in manufacturing, telecommunication, and other industries. The respondents were senior internal or external auditors for the surveyed companies. The survey questionnaires were gathered from December 2012 to March 2013.

2.4 Reliability Test

To discern the underlying constructs in the 50 question items, a principal components factor analysis with varimax rotation is performed. Reliability tests are conducted for each factor category consisting of more than one item by Cronbach's alpha. Reliability is the stability of the scale based on an assessment of internal consistency measuring the construct for the

collected data. The relationships among the items in each factor category were examined to determine whether they measured the same concept. The coefficient alphas of research variables are indicated in <Table 1>. The resulting alpha values ranged from 0.70 to 0.94, which were above the acceptable threshold (0.70) suggested by Hair et al. [1998].

3. Results and Implications of Findings

3.1 The Changes in Control Environment and IT Control Factors

The survey results are summarized in <Table 2>. It shows the change in control level by factor and category before and after 2010, and provides the t-value for statistical significance.

All the levels of factors and categories of internal control improved significantly in before and after 2010. The change in the level of control environment factor is higher than that of IT control factor. These results are consistent with the expectation that the market and governmental forces initiated by the economic crisis have led companies to focus on the reliability and compliance more than the effectiveness and efficiency driven by the corporate profit-seeking force, therefore the companies have put more efforts to strengthen the level of control environment factor than that of IT control factor.

The most improved control category is "Risk Assessment" and the next most improved control categories are "Organization, Roles, and Responsibilities" and "Overall Monitoring." All three highly improved categories belong to the control

<Table 1> Reliability Test of Internal Control Factor Categories

Internal Control Factor Categories	Cronbach's Alpha	
	Before 2010	After 2010
Overall	0.9290	0.9473
I. Control Environment		
(1) Organization, Roles, and Responsibilities	0.7018	0.7074
(2) Risk Assessment	0.7149	0.7148
(3) Overall Monitoring	0.7557	0.8030
II. IT Control		
(4) IT Function and Organization	0.7164	0.7494
(5) Characteristics of Systems and IT	0.8242	0.8606
(6) IT Monitoring Control	0.8964	0.8959

environment factor. On the other hand, the least improved control category “IT Function and Organization” and the less improved categories

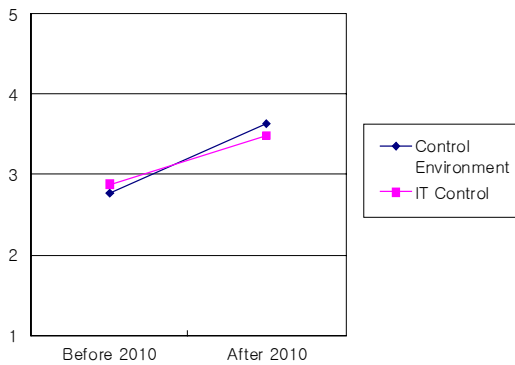
“Characteristics of Systems and IT Environment” and “IT Monitoring Control” belong to IT control factor.

<Table 2> Changes in Internal Control Level by Category and Factor

Control Factor	Before 2010	After 2010	Changes	t-value
I. Control Environment	2.78	3.63	0.85	7.397***
100. Organization, Roles and Responsibilities	2.69	3.48	0.79	8.356***
110. BOD Role	1.71	2.92	1.21	8.295***
120. Effectiveness of the Organization and Key Management	3.47	3.95	0.48	4.555***
130. HR Policies and Procedures	2.88	3.57	0.69	5.210***
200. Risk Assessment	2.61	3.58	0.97	5.264***
210. Risk Assessment Process	2.18	3.22	1.04	4.257***
220. Legal Compliance Review Process	3.03	3.94	0.91	4.572***
300. Overall Monitoring	3.04	3.83	0.79	6.036***
310. Reasonableness of Management Plans and Budgetary Control	3.13	4.15	1.02	6.712***
320. Reliability of Financial Reporting and Management Estimates	3.18	3.79	0.61	4.496***
330. Roles of the Audit Committee and Internal Control	2.82	3.54	0.72	3.999***
II. IT Control	2.88	3.48	0.60	5.710***
400. IT Function and Organization	3.29	3.79	0.50	5.513***
410. IT Strategy	2.99	3.85	0.86	5.756***
420. Management and User Satisfaction	2.98	3.48	0.50	3.658***
430. IT Organization	3.35	3.74	0.39	3.558***
440. IT People	3.85	4.07	0.22	2.032**
500. Characteristics of Systems and IT Environment	2.78	3.38	0.60	5.383***
510. Technical Architecture	2.27	3.01	0.74	5.379***
520. Usage of Emerging Technology	2.24	2.98	0.74	4.158***
530. Key Applications and Background	2.52	3.15	0.63	4.177***
540. Known Problems with Systems	4.08	4.35	0.27	2.810**
600. IT Monitoring Control	2.57	3.28	0.73	4.472***
610. IT Performance Measures	1.92	2.51	0.59	2.812**
620. System Development and Implementation	3.61	4.40	0.79	4.750***
630. Application Maintenance	2.57	3.36	0.79	3.387***
640. IT Strategy	2.61	3.61	1.00	5.476***
650. Computer Operation	2.56	3.22	0.66	2.457**
660. Business Continuity and Disaster Recovery Plan	2.15	2.61	0.46	2.848**
Overall Level of Internal Control	2.83	3.56	0.73	7.423***

Significant at 5%, *Significant at 1%.

In before 2010, the level of control environment factor is less than that of IT control factor while the reverse holds in after 2010 because the improvement of control environment factor is much higher than that of IT control factor as shown in <Figure 3>.



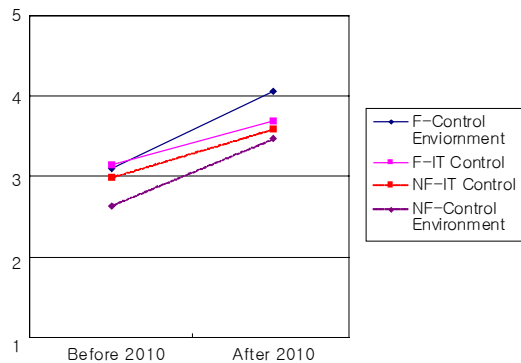
<Figure 3> The Changes in the Levels of Control Environment and IT Control Factors

3.2 The Changes in Internal Control by Industry

The financial companies generally have tighter internal control than non-financial companies. The market and government facing the financial crisis in 1997 and 2008 put even more pressure on financial companies to upgrade the reliability of financial reporting and the compliance of applicable laws and regulations to the global level than on non-financial companies. Therefore, the market and governmental forces are expected to have driven restructuring financial companies to enhance the level of control environment factor more than non-financial companies.

As shown in <Figure 4>, the levels of internal control of financial companies appear to be higher than those of non-financial companies regarding both control environment factor and IT control

factor in before 1997 until today. Both financial and non-financial companies increased the overall level of internal control significantly and enhanced the level of control environment factor more than that of IT control factor. Relatively, financial companies increased the level of control environment factor more than non-financial companies did while non-financial companies upgraded the level of IT control factor more than financial companies did. These results are consistent with the expectation led by the higher market and governmental pressure on financial companies for the transparency of management and accounting.



<Figure 4> The Changes in the Levels of Control Environment and IT Control Factors by Financial (F) and Non-Financial (NF) Industries

The level of control environment factor of financial companies in after 2010, which is 4.06, appears to be that of global advanced practice. Especially, the level of risk assessment control of financial companies has been the most improved and is the highest in after 2010, which implies that Korean financial companies has become capable of risk assessment and control by realizing the importance of risk management due to the economic crisis.

3.3 The Changes in Internal Control by Category

3.3.1 Control Environment Factor

Control environment factor contributes directly to the control objectives of the reliability of financial reporting and the compliance of laws and regulations. As the market and governmental forces for the transparency of management and accounting became higher due to the economic crisis, companies put more resources to the control environment factor than IT control factor which contributes directly to the effectiveness and efficiency objectives.

The most improved control category is "Risk Assessment" and the next most improved control categories are "Organization, Roles, and Responsibilities" and "Overall Monitoring." All three highly improved categories out of six control categories belong to the control environment factor.

1) Organization, Roles and Responsibilities

The organization, roles, and responsibilities are the key elements of control environment. The level of control relating to "Organization, Roles, and Responsibilities" has improved from 2.69 in before 2010 to 3.48 in after 2010.

The control level relating to "Roles of the Board of Directors" has improved from 1.71 in before 2010 to 2.92 in after 2010. This control was the worst one in before 2010 and still low in after 2010 among the 22 control factors though it has improved more than other two controls in this category. The improvement in the percentage of outside directors among BOD mem-

bers and the degree of BOD independence from management contributes to the high enhancement of the role of BOD control.

Ever since the economic crisis, Korean government has strongly emphasized sound corporate governance, and thus encouraged the increase in the percentage of outside directors. The Stock Exchange Law and related Presidential Decree were modified in 2001 to require Korean listed companies that outside directors be more than 1/4 of the number of total BOD members. In the case of listed companies whose total asset is more than 2 trillion Korean Wons (approximately 1.8 billion US Dollars), outside directors should number more than 3 as well as being more than 1/2 of the total number of BOD members.

Though the level of independence of BOD members from management has been improved significantly, independent BOD members still make up less than 50% of the total BOD even in 2010. Accordingly, the risk of BOD ineffectiveness still exists. The improvement has already been made in appearance while the changes in substance are expected yet to follow.

There have been drastic changes in Human Resources (HR) policies and practices. The traditional HR practices based on the life-time employment and period-based compensation have been replaced by performance and competency-based practices.

2) Risk Assessment : The Most Improved Control Category while the Worst in before 2010

The level of control related to the "Risk Assessment" has significantly improved from

2.61 in before 2010 to 3.58 in after 2010, which is the biggest change among 6 control categories. To achieve operational effectiveness and efficiency, it is required that senior management identify, evaluate, and manage the key risks underlying the business. To accomplish this task, the policies and procedures relating to the risk tolerance, risk profiling, risk measurement, and limit controls should be established. In addition, it is recommended that risk management be integrated with performance management to measure the performances more effectively.

In most Korean companies, there had been little practice or shared definition of "Risk Management" before the financial crisis in 1997 and 2008. However, as most companies came across liquidity difficulties and subsequently experienced big losses because of volatile fluctuation of interest rate, foreign exchange rate, and stock prices, they realized the significance of risk management. To recover from this crisis, the Korean Financial Supervisory Service has established rigorous guidelines and strongly enforced financial institutions, especially banks, to implement the risk management policies and procedures and has monitored them through its supervisory process. Non-financial companies also realized the importance of risk management, and accordingly have been developing risk management practices for their own benefit.

There were weak and informal risk policy and risk assessment processes in Korean companies in before 2010 while the risk policy and processes became official and formal in after 2010. There was either no risk management staff or risk management was mostly performed by unofficial

part-time staff in before 2010. In after 2010, however, risk management was performed by official part-time or full-time staffs. Especially, among the 10 respondents which belong to the financial industry, 80% responded they have multiple official full-time risk management staffs in after 2010 while 40% had no risk management staff in before 2010.

The level of review process for compliance with laws and regulations has been also improved significantly from 3.03 to 3.94. The management review process became more formal in after 2010 while being informal in before 2010. The management processes are based on the official compliance policy in both cases. However, this review process still appears to be performed on an irregular basis even in after 2010.

3) Overall Monitoring : The Best Control Category in after 2010

The level of control relating to "Overall Monitoring" has improved from 3.04 in before 2010 to 3.83 in after 2010, and became the best control category in after 2010. The level of "Overall Monitoring" control in after 2010 becomes close to that of the global advanced practice.

Senior management is required to continuously monitor the effectiveness of internal control to assure the reliability of the company's internal control. This monitoring process is performed either as part of the daily regular operation or as separate additional work, e.g., internal audit.

The recognition of the importance of monitoring control has grown significantly since the economic crisis as management realized that it provides early warning to potential danger and

even catastrophes. Most companies have strengthened their internal audit functions in terms of manpower, required skill sets, and work scope. In addition, the Commercial Code has been revised to strengthen monitoring control. It was recommended to establish the audit committee as an alternative to the statutory auditor at the shareholders' choice. According to the Stock Exchange Law revised accordingly, those companies with total assets exceeding 2 trillion Korean Wons (approximately 1.8 billion US Dollars) should establish an audit committee. To enhance the effectiveness of the audit committee, the Ministry of Finance and Economy has recently proposed a new regulation which strengthens the required competencies of the audit committee, i.e., an accounting or finance professional should be included as a member of the audit committee.

In 2011, the Financial Supervisory Service announced the guidelines and held workshops several times to enhance the internal audit function of financial institutions. It requires financial institutions to establish more detailed internal audit regulations and manuals specifying internal auditor's roles and responsibilities.

In addition, Korea companies have tried to enhance their performance management policies and procedures. To enhance the reasonableness of management plans and budgetary controls, companies have redesigned the planning and budgeting process as well as the cost and performance analysis process. Many companies have adopted analytical tools to implement Activity-Based Costing or Balanced Scorecard to monitor their performance more accurately. The survey

and interview results imply that all those efforts described above have contributed to improve the monitoring control level of Korean companies.

3.3.2 IT Control Factor

IT control factor contributes directly to the control objectives of effectiveness and efficiency of operations which are natural goals of profit-seeking companies. The effectiveness and efficiency continue to be important goals of internal control before and after the economic crisis while this shock led market, government, and companies to put more emphasis on the reliability of financial reporting and the compliance with laws and rules. IT control factor has improved significantly during before 2010 to today though the change in the level of IT control factor is less than that of control environment factor.

The changes in the level of all three control categories for IT control factor are below those of three categories for control environment. Among three IT control categories, the most improved one is "IT Monitoring Control." The next improved control category is "Characteristics of System and IT Environment" while the least improved one is "IT Function and Organization."

1) IT Function and Organization : The Least Improved Control Category but the Second Best in after 2010

Senior management has the responsibility to establish the policies and procedures to provide sufficient and competent information on a timely basis to make competitive business decisions.

The IT function and organization is one of the key internal control factors in accomplishing this goal.

The level of control related to "IT Function and Organization" has improved from 3.29 in before 2010 to 3.79 in after 2010, which is the least improved among the 6 control categories. However, this is the second best category in after 2010.

The control level relating to "IT Strategy" has improved significantly, i.e., IT strategy planning process has become more structured and reasonably integrated with the business strategy.

The improvement in the control level related to "IT People" is minimal though the evaluated level is relatively high both in before 2010 and after 2010. The level of "IT People" in after 2010, which is 4.07, is equivalent to that of global advanced practice. The control level relating to the turnover ratio of IT people has improved slightly while the control level relating to the skill of IT people has remained at almost the same level, both of which, however, are higher than the average level of internal control.

2) Characteristics of System and IT Environment

As IT becomes one of the most important business resources, the characteristics of system and IT environment become key elements which determine the level of internal control. The level of control relating to "Characteristics of System and IT Environment" has improved from 2.78 in before 2010 to 3.38 in after 2010.

The control score related to "Known Problems with Systems" at 4.08 was the best one in before

2010. This score has been improved to 4.35 and is the second highest one in after 2010. On the average, IT systems are evaluated as reliable in Korean companies.

3) IT Monitoring Control : The Worst Control Category in after 2010

The level of "IT Monitoring Control" has improved from 2.57 in before 2010 to 3.28 in after 2010. Though the change in the level of "IT Monitoring Control" is relatively high, the level of this control category remains the worst both in before and after 2010.

The control score related to "IT Performance Measures" at 2.51 is the worst one in after 2010 while that at 1.92 was the second worst one in before 2010 among 22 factors. It appears that the performance of the IT function is still not measured in a structured way. Accordingly, there may exist certain risks of under-performance or inefficiencies of the IT function if it is not sufficiently monitored by management.

The level and change in "Business Continuity and Disaster Recovery Plan" turns out to be low. The readiness of Korean companies in case of emergency and contingency is still not enough and needs to be upgraded.

The control score of "System Development and Implementation" at 4.40 is the best one in after 2010 while that at 3.61 was the third best one in before 2010 among 22 control factors. The methodology, sponsors, and monitoring procedures for system development appear reliable in most Korean companies. The consistency between IT and business strategy appears to have improved noticeably as well.

4. Conclusions

According to COSO's broad definition, internal control includes corporate governance, risk management, control activities, disclosure control and procedures, and internal audit which are the infrastructure determining the transparency, competitiveness, and sustainability of a company. The internal control system can make accounting records trustworthy and promote the compliance with business policies and regulations that eventually improves the effectiveness and efficiency of management.

Accounting manipulation and moral hazard were blamed to cause the Korean economic crisis in 1997. Since then, the capital market and Korean government has had a strong pressure on Korean companies to enhance the transparency of management and accounting. Internal control has become one of the hottest issues in Korea since the financial crisis in 1997 and 2008.

The average level of internal controls of major Korean companies has noticeably improved before and after 2010 according to the results and analysis from the survey. The change in the level of control environment factor is higher than that of IT control factor. These results are consistent with the expectation that the market and governmental forces initiated by the economic crisis have led companies to focus on the reliability and compliance more than the effectiveness and efficiency driven by the corporate profit-seeking force, therefore the companies put more efforts to strengthen the level of control environment factor than the IT control factor.

The capital market and government facing the

economic crisis put even more pressure on financial companies such as banks to upgrade the reliability of financial reporting and the compliance of laws to the global level than on non-financial companies. Therefore, the market and governmental forces drove financial companies to enhance the level of control environment factor more than non-financial companies. Relatively, financial companies increased the level of control environment factor more than non-financial companies did while non-financial companies upgraded the level of IT control factor more than financial companies did. These results are consistent with the expectation led by the higher market and governmental pressure on financial companies for the transparency of management and accounting.

Among internal control categories, the most improved area since the economic crisis is "Risk Assessment" which requires management to identify, evaluate, and manage the key risks underlying the business and to establish the policies and procedures relating to risk tolerance, risk profiling, risk measurement, and limit controls. The global best practices for risk management have been developed primarily in the financial industry and then spread to other industries. "Overall Monitoring", the management's monitoring of business performance, is the best developed area while "IT Monitoring Control", the management's monitoring of IT performance, is the least developed area in after 2010. The level of "IT Function and Organization" is surveyed as relatively high.

The overall level of control practices of Korean companies has been improving significantly but

still appears below the global advanced practices. Corporate governance is one of the areas where more improvement is required. Relating to the independent roles and responsibilities of the board of directors, a noticeable improvement has already been made in appearance, however the changes in substance are expected yet to follow.

The measurement model developed and applied in this paper is a high-level assessment model, and accordingly requires further modification for more detailed assessment of the level of control reliabilities. This model can be further utilized to benchmark the best practices for internal control and also to pinpoint the weaknesses and recommendations for the internal control practices.

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