

Relationship between Characteristics of Accounting Firms and Audit Engagement Risks based on Bayesian Network[†]

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<Abstract>

One of the methods of securing the reliability of accounting information is maintaining high audit quality. The first step of improving audit quality is lowering audit engagement risks. Thus, this study analyzed the relationship between the characteristics of accounting firms and audit engagement risks based on the Bayesian Network. For this, Markov Blanket, the minimum explanatory variable set, which affects audit engagement risks, was presented, and based on the drawn causal relationship, sensitivity analysis was conducted to verify the characteristics of accounting firms, which affect audit engagement risks. The existing preceding research that used multiple regression analysis presumes the linearity between explanatory variables and dependent variables, so there was a limit in drawing the relationship between explanatory variables. Therefore, this study figured out the interdependence between variables using the General Bayesian Network and examined the impact that each variable has finally on audit engagement risks that affects the audit quality. The results of this study would greatly contribute to improving the efficiency of the supervisory task by allowing a supervisory institution to identify an accounting firms that does not manage audit engagement risks properly and to improve the supervision of the accounting firms in advance. In addition, this study will be used as a reference when a supervisory institution would improve the system related to audit quality by presenting the characteristics of accounting firms related to the audit quality.

Key Words: Audit Engagement Risks, Characteristics of Accounting Firms, Bayesian Network, Sensitivity Analysis

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I. Introduction

Financial statements are one of the most important accounting information provided by companies. Auditors increase the reliability of the financial statements by independently auditing whether companies prepared them properly according to the accounting standards. Auditing provides the reliability of the financial statements made by the managers and can increase the value of the companies by reducing the agent cost incurring from the separation between ownership and management. Like this, auditors play a key role in securing the reliability of accounting information provided by financial statements, so it is very important for them to provide high-quality audit services.

On the other hand, the first task that can enhance audit quality starts with the audit engagement. In other words, auditors should have rational confidence in securing abilities and independence to perform audit work before contracting audit engagement with companies. Inappropriate audit quality management carried out before contracting this audit engagement is very likely to lead to a failure in auditing.

Thus, this study will analyze the characteristics of accounting firms that affect audit engagement risks of accounting firms using Bayesian Network. In concrete, with business reports of 124 South Korean accounting firms from 2007 to 2012, the ratio of disclaimers opinions added to qualified opinions due to the limit of the scope of audit was defined as audit engagement risks and

the relationships among the characteristics of accounting firms were analyzed to investigate the characteristics of accounting firms which have direct and indirect impacts on their audit engagement risks.

For this purpose, this study proposes Markov Blanket, the minimum explanatory variable set that affects audit engagement risks, using General Bayesian Network(GBN). In addition, by conducting a what-if analysis of a graph of causal relationship drawn, the characteristics of accounting firms which affect audit engagement risks are verified. Multiple regression, an analysis method widely used in preceding studies presumes only uniform linear functions between dependent variables and explanatory variables, so there is a problem that it cannot find the causal relationship existing between explanatory variables.

However, the Bayesian Network expresses the independence between variables belonging to a set of a specific field, well and based on this, it shows the causal relationship between explanatory variables as well as that between dependent variables and explanatory variables, probabilistically. Therefore, this study can draw the causal relationships among the characteristic of accounting firms which affect audit engagement risks, using the Bayesian Network and examine the impact of each variable on audit engagement risks through direct and indirect causal relationships. This can provide the managers of accounting firms with more effective method which improves the quality of audit services and increase the efficiency of the supervising tasks by allowing

supervisory institutions supervising accounting firms to differentiate and supervise accounting firms with high audit engagement risks.

The main results of this study are as follows. First, as a result of drawing a graph of causal relationships through the GBN, of the characteristics of accounting firms, whether an accounting firm is affiliated with a global accounting firm, the number of branch offices and the partner ratio of the CPA belonging to the firm showed direct causal relationships with audit engagement risks. In addition, the causal relationships among the characteristics of accounting firms could be drawn, too. In other words, whether an accounting firm is affiliated with a global accounting firm showed direct causal relationships with the number of branch offices, the size of the accounting firm, public company ratio, whether the auditor is a one-firm and the CPA belonging to the firm and the partner ratio of the CPA belonging to the firm showed direct causal relationships with whether it is a one-firm and the average audit experience.

Second, through Markov Blanket, the graph of the causal relationship drawn, using GBN, a sensitivity analysis(What-If) was conducted. Especially, by analyzing the change of the posterior probability of each explanatory variable if the prior probability of variables in a direct causal relationship with audit engagement risks, the ultimate impact on the dependent variables is presented.

If supervisory institutions identify accounting firms that do not manage audit engagement

risks properly in advance and reinforce the supervision of them through the results of this study, they can greatly improve the efficiency of accounting firms' supervision. In addition, to improve several systems for the enhancement of audit quality, presenting the characteristics of accounting firms in a direct causal relationship would provide a significant rational basis for the improvement of the system.

The composition of this study is as follows. Section II reviews preceding studies related to the research topic. Section III describes the research design, which discusses research methods, such as measurement of variables and selection of samples. Section VI presents the results of an empirical analysis, and section V is the conclusion of this study, which presents its contribution points.

II. Backgrounds and Precedent Literature

1. Characteristics of Accounting Firms

Since the larger the accounting firm, the greater the effect of the loss of quasi-rent according to damage on audit quality, auditors have the cause of the maintenance of high audit quality in order to prevent this (DeAngelo, 1981; Palmrose, 1986, Becker et al., 1998). Therefore, if the size of auditors is large, the auditors themselves will reinforce audit engagement management. Auditing gives

reliability to companies' financial statements, so their reputation is important in the stock market (Titmam and Trueman, 1986; Datar et al., 1991; Clarkson and Simunic, 1994). Therefore, in the audit market, companies are likely to contract auditors with high reputation. In addition, whether companies are listed may affect audit quality (Casterella et al., 2009). Thus, if there are more listed companies in the entire clients, auditors can maintain a high level of audit quality in order to control audit risks. Therefore, because of auditors' reputation, the higher the rate of listed companies in the entire clients, the lower the possibility of risks of audit engagement carried out prior to its contract can become.

Auditors' reputation can be formed by accumulating trust through audit work for a long time or by having an affiliation with a global accounting firm (Lee, 2011; Kwak and Jung, 2014). In other words, the longer their audit work, the more the possibility of the company's accumulation of know-how to manage audit quality well becomes. In addition, a business tie-up with a global accounting firm, including Big4 will allow them to have a systematic audit quality management system provided by the global accounting firm. Thus, it is expected that auditors with higher reputation would build and operate a higher level of the audit quality system, which appears as lower audit engagement risks. On the other hand, auditors have more expertise with more experience in related fields and their reputation, too, can increase. Therefore, CPA belonging to an

accounting firm, who have longer experience of audit would maintain high audit quality in order to maintain their reputation (Chi et al., 2012). It is expected that it will have a positive impact on audit engagement management, too.

Since partners are shareholders of an accounting firm, they tend to react sensitively to the business performance of the accounting firm. Hermanson et al. (2007) pointed out the larger number of partners to the total number of employee as one of the characteristics of an accounting firm in which vulnerability of the audit quality management system was found. In other words, from a high rate of partners, it can be inferred that the level of audit engagement management carried out before the contract of the audit engagement is very likely to be poor. Also, accounting firms can be divided into the type of 'one-firm' in which the operations of financial affairs, personnel affairs and profit sharing are integrated like a single firm and the type of 'independent profit system' in which those are operated independently by partners, mostly. In a situation in which an accounting firm's profit is integrated and distributed, many partners in the accounting firm have the cause of the prevention of audit risk that may affect them, and for this, they build and operate a high-level audit quality management system (Carcello et al., 2000; Lee, 2011). Thus, since an accounting firm in the type of one-firm can substantially control the individual partners' performance of audit work, they are capable of management with a higher

level audit quality, and they can manage the risks of audit engagement carried out before the contract of audit engagement better. On the other hand, if an accounting firm has many regional offices, it is difficult for the head office to control the partners' audit work at the regional offices, so it comes to grant more requests from companies (Trompeter, 1994; Carcello et al., 2000). Therefore, the more the regional offices of an accounting firm, the easier its company-wide audit quality gets lower, which may act as a cause for the increase of audit engagement risks.

2. Bayesian Network

Bayesian Network is a tool that describe quantitative aspects and the qualitative aspects simultaneously by showing the distribution of probability of the combination between variables when a set of probability variables consisting of discrete properties is given (Baesens, 2004). Here, the quantitative aspects mean the parts in which the Bayesian Network specifies the conditional probability between variables while the qualitative aspects mean the expression of conditionally independent or dependent relationships between variables (Pearl, 1988). In other words, the Bayesian Network consists of a graph representing the express probabilistic dependency relationships between variables by expressing the data in a specific area probabilistically and conditional probability of each variable (Jensen, 1996; Sun, 2015).

Therefore, the Bayesian Network could be

defined as a Directed Acyclic Graph (DAG) having a Conditional Probability Table (CPT) in each node. At this time, the node means a variable belonging to a specific data set such as X_1, X_2, \dots, X_n , and the arc refers to the causal relationship between the nodes. A network is organized with the probabilistic causal relationship between variables, and the result is inferred with the CPT. When it has a structure, $Y \rightarrow X$, Node Y is the parent node of Node X. The Bayesian Network can be expressed in the below expression (1) by the Bayesian theorem, product rule and chain rule. Where $Pa(x_i)$ is the parent node of x_i and x_1, x_2, \dots, x_n is a set of specific data properties.

$$P(x_1, x_2, \dots, x_n) = \prod Pa(x_i | Pa(x_i)) \quad (1)$$

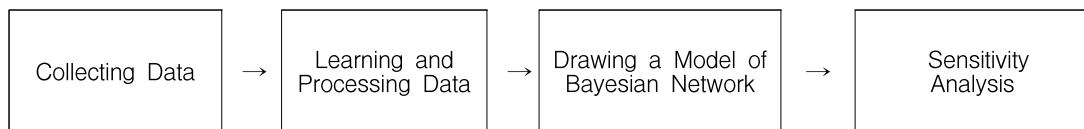
The Bayesian Network is useful in learning a large amount of data in the actual world, finding the relationships among them and estimating parameters. In other words, a merit of the Bayesian Network is that it can easily express the causal relationship between variables and probabilistic dependency relationship. The types of the Bayesian Network are classified broadly into three. First, it is known that Naive Bayesian Network (NBN), the most brief form shows relatively higher classification performance in spite of the simplicity of its presumption (John and Langley, 1995). However, the NBN has a demerit that it presumes the independence of a class node between variables unlike other nodes and does not reflect the actual world, appropriately. Second, Tree Augmented

Naive(TAN) Bayesian Network presumes that there is interdependence between other nodes, as well, in order to overcome the presumption that the nodes other than the class node in the NBN are too independent, adds the interdependence between them and improve the learning ability of the NBN to increase category performance(Friedman et al.,1997). Lastly, there is General Bayesian Network(GBN), which is the most generalized form of the Bayesian Network. The GBN, unlike other types of Bayesian Network, does not presume a difference between a class node and other nodes, but presumes the interdependence among all the nodes, so it has a merit that it can best represent the causal relationships between variables(Bouckaert, 1995). Therefore, in the GBN, the class node, too, can have a parent node. Markov Blanket is a method of showing the minimum explanatory variable set necessary for classifying the dependent variables in a given data set(Koller and Sahami, 1996; Tsamardinos et al., 2003).

III. Research Design

1. Research Method

This study will use Bayesian Network in order to examine the characteristics of accounting firms, which have an important impact on audit engagement risks and infer the meaning of various variables through a sensitivity analysis(What-If). The Bayesian Network presents the probabilistic relation among many variables in the form of a minimum set and helpfully used in the fields such as probabilistic inference, prediction and decision-making. If a causal relationship between audit engagement risks and characteristics of accounting firms is drawn through Bayesian learning, a sensitivity analysis is conducted, which presumes various scenarios for the property of each independent variable to check the impact of a change of a specific variable on a dependent variable. This study using the Bayesian Network can be summarized like Figure 1.



<Figure 1> Research Procedure

2. Measuring Variables

2.1 Audit Engagement Risks

This study analyzes the relationship between the audit engagement risks and the characteristics of accounting firms using a Bayesian Network. Thus, how to measure audit engagement risks is important, which is the core of this study. One of the most important procedures for the auditors when they decide whether they contract audit engagement is to assess the sincerity of companies, in other words, whether they can cooperate well for the audit data and procedures the auditors ask for in an audit. In addition, not concluding a contract with a company with excessively much audit risk. The best method the auditors can use when the company ignores or neglect this is to limit the scope of audit or to express a qualified opinion(or disclaimer opinion) because of important uncertainty. Of course, qualified opinions are expressed when a company violated the accounting standards, but qualified opinions are likely to be the expressions of opinions because of the limitation of the scope of audit, generally. Therefore, this study considered audit engagement risks as the ratio of disclaimer opinions and qualified opinions due to the limitation of the scope of audit.

2.2 Characteristics of Accounting Firms

The characteristics of accounting firms can be divided broadly into the size of the accounting firms, their reputation, their

organization of human resources and their operation method. First, for the size of the accounting firm(Auditfee), the amount of earnings from audit of the accounting firms was measured(Casterella et al. 2009; Choi, 2012).

Second, accounting firms' reputation was measured with the public company ratio(PCR) audited by the auditors, whether they are affiliated with a global accounting firm(Member), the average experience of the CPA belonging to the accounting firm(Exp) and the auditors' expertise. First of all, for the PCR, the value of the number of public companies divided by the total number of companies audited by the auditors was used. Next, for whether they are affiliated with a global accounting firm, a dummy variable having a value of 1 if an accounting firm is in an affiliation with a global accounting firm and a value of 0 if not. The average audit experience was measured by the average of the years of the experience of the CPA belonging to the accounting firm. In addition, the audit experience was subdivided into the number of the CPA with less than three years' experience(Under3) and the CPA with more than 10 years' experience(Over10) to measure the expertise of the CPA belonging to the accounting firm.

Third, for the organization of human resources of accounting firms, the ratio of partners that constitute the accounting firms was measured. In other words, for the partner ratio(Partner), the ratio of partners of the total number of the CPA belonging to the

accounting firm was measured and used.

Lastly, the operation method of accounting firms was judged according to the type of the organization of the accounting firm(Onefirm) and the number of regional offices(Officeno). Concerning the type of the organization of the accounting firm, they can be divided broadly into ‘one-firm type’ and ‘independent profit system type’. Thus, it was measured by a dummy variable which gives 1 to an accounting firm that uses an one-firm type operation method and 0 to one that does not

use it. For the number of regional offices, the number of each accounting firm’s branch offices was used.

The variables used to examine the relationship between audit engagement risks and the characteristic of accounting firms, which is the purpose of this study are like Table 1 below. To use the analysis method of this study, Bayesian Network, each variable should have a category-type value, so they were categorized like Table 1.

<Table 1> Definition and Categorization of Variables

Classification	Name of Variables	Definition of Variables	Categorization
Audit Engagement Risks	Risk	The sum of the ratio of disclaimer opinions and qualified opinions: The larger the value, the higher the risk becomes	3 groups at an equal frequency
Characteristics of Accounting Firms	Auditfee	The amount of audit fee by the accounting firm	3 groups at an equal frequency
	PCR	The public companies ratio audited by accounting firm	3 groups at an equal frequency
	Member	Whether they are affiliated with a global accounting firm	Binary
	Exp	Audit experience of the CPA belonging to the accounting firm	3 groups at an equal frequency
	Under3	This means the auditors’ expertise, which is the number of the CPA with less than three years’ experience of auditing	3 groups at an equal frequency
	Over10	This means the auditors’ expertise, which is the number of the CPA with more than ten years’ experience of auditing	3 groups at an equal frequency
	Partner	The ratio of partners of the total number of the CPA belonging to the accounting firm	3 groups at an equal frequency
	Onefirm	The type of the organization of the accounting firms	Binary
	Officeno	The number of branch offices of the accounting firms	3 groups at an equal frequency

3. Selecting Samples

Samples of this study were accounting firms with firm-year from 2007 to 2012. Accounting firms should submit business reports to the Financial Supervisory Service, and the

Financial Supervisory Service(FSS) disclose them on its home page. Thus, this study used the data collected based on the business reports of 124 accounting firms released between 2007 and 2012. Table 2 describes the samples of each year.

<Table 2> Sample by Year

Year	Number
2007	93
2008	98
2009	104
2010	118
2011	123
2012	124
Total	660

IV. Result of an Empirical Analysis

1. Descriptive Statistics

The below Table 3 is the quantity of descriptive statistics about the variables used in this paper. The mean(median) of audit fee of accounting firms is about 0.321(0.308). Their CPA' average audit experience is about 10.231

years. Also, the number of branch offices owned by each accounting firm is 1.677. In addition, about 30% of the entire samples have an affiliation with a global accounting firm, and 8.5% is in the type of one-firm in which the operations of financial and personnel affairs are integrated. Of the whole clients of the accounting firms, about 6.3% are public companies(PCR) and about 52% of the CPA have the ranks of partners.

<Table 3> Descriptive Statistics

Variables	Mean	Std Dev.	Min	25%	Median	75%	Max
Auditfee	0.321	0.138	0.013	0.219	0.308	0.406	0.501
Exp	10.231	2.764	2.651	8.092	10.012	12.201	17.50
Officeno	1.677	1.673	0.000	0.000	1.000	2.000	13.00
Risk	0.118	0.008	0.000	0.060	0.105	0.162	0.630
PCR	0.063	0.064	0.000	0.019	0.049	0.091	0.500
Member	0.299	0.453	0.000	0.000	0.000	1.000	1.000
Partner	0.519	0.238	0.000	0.344	0.500	0.720	24.00
Onefirm	0.085	0.256	0.000	0.000	0.000	0.000	1.000

Note: The definitions of the variables are as shown in <Table 1>

2. Drawing the Causal Relationship between Variables through GBN

As described above, the GBN is a very useful method for extracting the causal relationship between variables(Cheng et al. 2002). This study draw Markov Blanket, the minimum explanatory variable set, which affects dependent variables, by applying the GBN, concerning the causal relationship between variables and showed that in Figure 2 below.

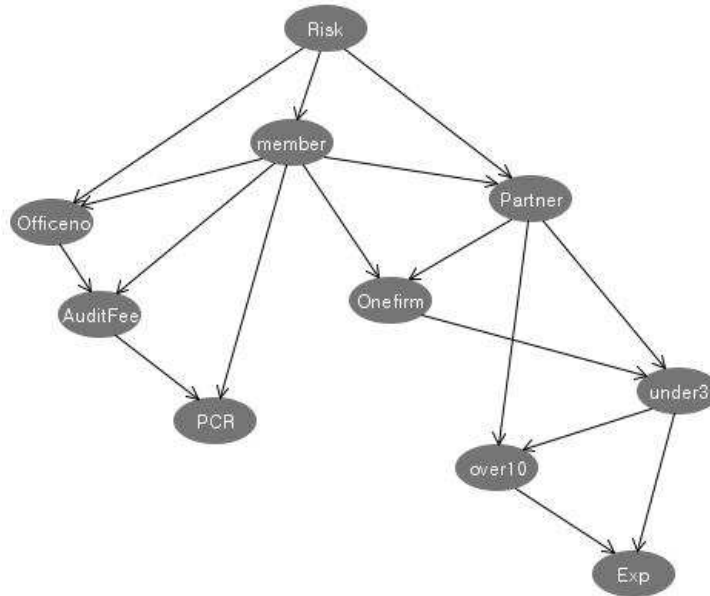
In the above results, the variables directly affecting audit engagement risks(Risk) include the number of branch offices(Officeno), which represents the operation method of accounting firms; whether it is affiliated with a global accounting firm(Member), which is their reputation; partner ratio(Partner), which represents their organization of human resources. However, of the size of the accounting firm(Auditfee), public company

ratio(PCR) and the operation method of accounting firms, whether it is an one-firm(Onefirm), the auditors' expertise(Over10 and Under3) and average audit experience(Exp) did not have a direct impact on audit engagement risks.

In addition, a merit of the GBN is that it can show the causal relationship between explanatory variables as well as that of the class node. In the causal relationships among the characteristics of accounting firms drawn through this study, whether they are affiliated with a global accounting firm(Member) had direct relationships with whether they are one-firms(Onefirm), the number of branch offices(Officeno), the size of the accounting firm (Auditfee), public company ratio(PCR), the partner ratio of the CPA belonging to the accounting firm(Partner), but it did not have any direct relationships with the auditors' expertise(Over10 and Under3) and average audit experience(Exp).

Moreover, the number of branch offices (Officeno) had a direct relationship with the size of the accounting firm(Auditfee), and the partner ratio of the CPA belonging to the

accounting firm(Partner) had direct relationships with whether it is an one-firm (Onefirm) and the auditors' expertise(Over10 and Under3).

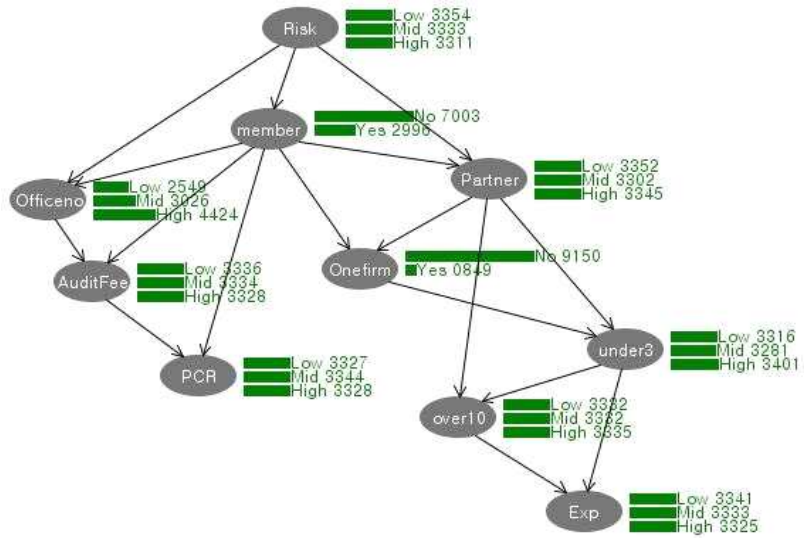


<Figure 2> Drawing Markov Blanket

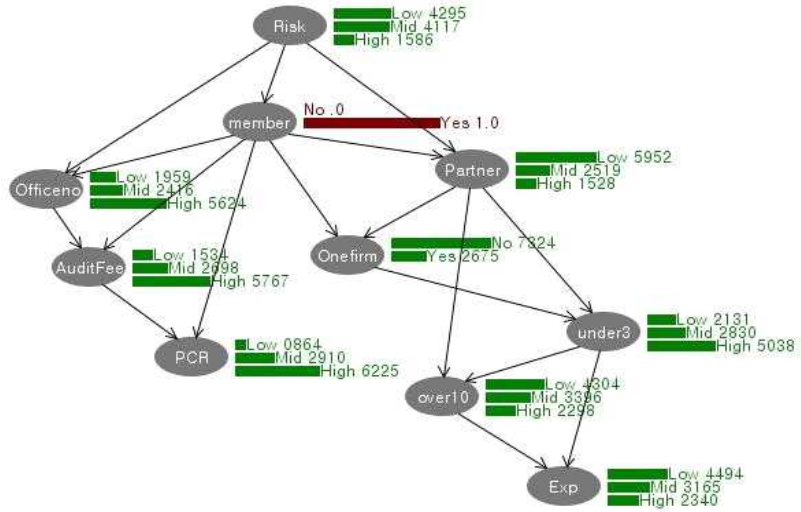
3. Sensitivity Analysis

Markov Blanket drawn by Bayesian Network shows whether explanatory variables representing the characteristics of accounting firms are ultimately connected to audit engagement risks through a direct or indirect causal relationship with other explanatory

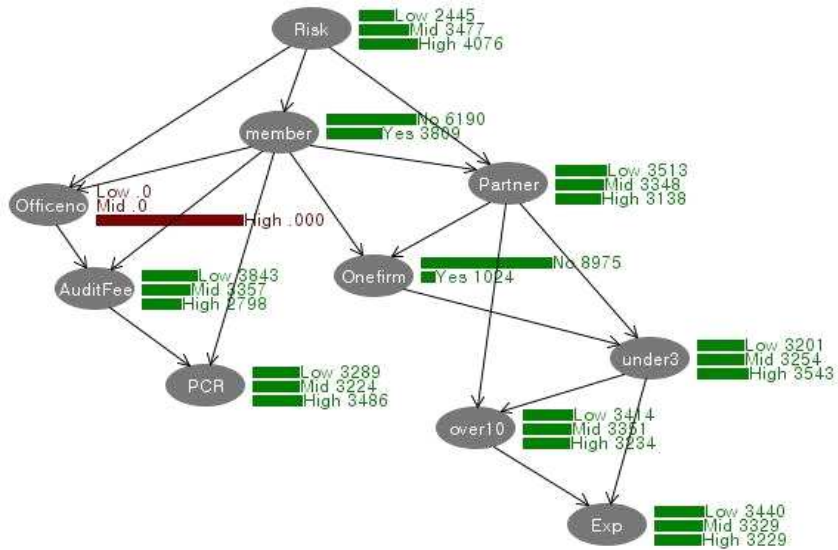
variables, so various sensitivity analyses can be conducted. The Bayesian Network has a Conditional Probability Table(CPT), so a what-if analysis is possible by entering the prior probability, the result value drawn by the GBN and the probability value of a specific variable, and the results of the analysis are like Figure 3.



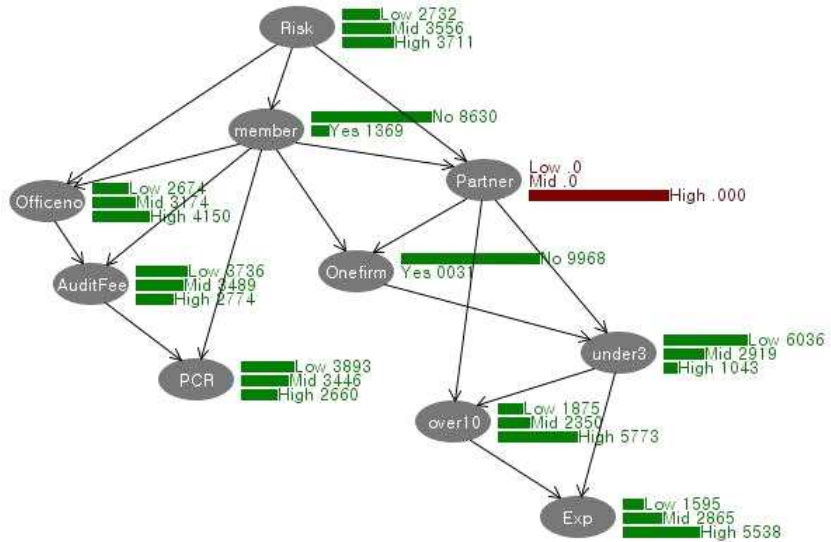
Panel A



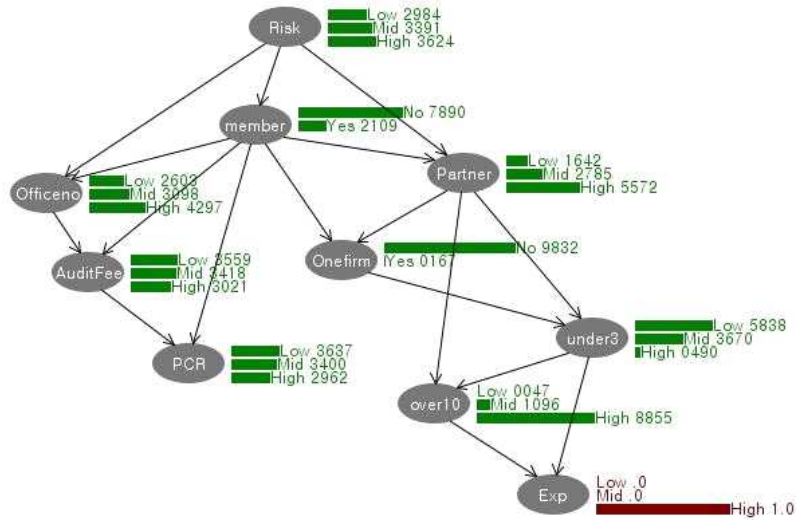
Panel B



Panel C



Panel D



Panel E

<Figure 3> What-If Analysis

A merit of a what-if analysis is that it can expect the results according to various situations which may occur in the actual world. The prior probability of the causal relationship drawn through GBN is shown in Panel A of Figure 3. The prior probability presented in Panel A shows the probabilistic distribution of the data sets for this study, which can be compared with the quantity of descriptive statistics in Table 3. For a Bayesian Network analysis, sequence data should be divided by properties, and excluding whether the accounting firm is affiliated with a global accounting firm(Member), which is a binary variable and whether it is an one-firm, which represents the operation method of the accounting firm, the firms were divided into three groups at an equal frequency(Table 1).

Thus, like Table 3, the accounting firms affiliated with a global are about 30% of the whole samples while those operated in the form of one-firm are about 8.5%. The remaining variables were divided into three groups at an equal frequency, the prior probability of low, mid and high groups is about 33%, respectively.¹⁾

Next, the variables that have direct impacts on audit engagement risks were analyzed. Panel B shows how the posterior probability of each variable changes in an accounting firm affiliated with a global accounting firm. First, in audit engagement risks, from the fact that the probability that it is included in high group decreased to 15.8% while the probability that it is included in a low group increased to 43%, it is found that, an accounting firm's

1) Since the number of branch offices is a discrete variable, the distribution of each of the low, mid and high groups, does not appear the same, even if they are classified at an equal frequency.

audit engagement risks becomes lower if it is affiliated with a global accounting firm. In addition, a high group increased to 57.7% and 62.2%, respectively, in the size of the accounting firm(Auditfee) and in public company ratio(PCR), and a low group increased to 59.5% in partner ratio(Partner) of the CPA belonging to the accounting firm, so it turned out that affiliation with a global accounting firm had a positive relationship with the size of the accounting firm and public company ratio(PCR), and a negative relationship with the partner ratio of the CPA belonging to the accounting firm.

Panel C shows the change of the posterior probability of each variable for a group with high points for the number of branch offices(Officeno). The probability that the audit engagement risk(Risk) of the main variables of interest in this study might belong to a low group decreased to 24.5% while the probability that it might belong to a high group increased to 40.8%. This is consistent with the expectation of this study that the level of audit quality management is likely to become lower if there are many regional offices of an accounting firm, so audit engagement risks increase.

Panel D shows a group with a high partner ratio of the CPA belonging to the accounting firm(Partner). According to preceding studies, it was pointed out that a high partner ratio of the CPA belonging to a accounting firm would have a problem with its audit quality management system(Hermanson et al., 2007). In the results of this study, too, when the

partner ratio of the CPA belonging to the accounting firm became higher, the ratio of a group with high audit engagement risks(Risk) increased to 37%. However, whether it is affiliated with a global accounting firm(Member) did not change much as compared to the number of branch offices(Officeno). In contrast, it had a great impact on the auditors' expertise(Over10 and Under3), and there was a noticeable change in the posterior probability in the average audit experience(Exp).

Lastly, the group with high average audit experience(Averexp) showed a clear change in posterior probability of the auditor's expertise(Over 10 and under 3), but it did not have a great impact on audit engagement risks(Panel E in Figure 3).

V. Conclusion

This study analyzed the relationship between characteristics of accounting firms affecting audit engagement risks and characteristics of each accounting firms, using Bayesian Network. This study dealt with 124 accounting firms that submitted business reports to the Financial Supervisory Service between 2007 and 2012. The audit engagement risks used in this study were defined as sum of the ratio of disclaimer opinion and qualified opinion due to the limitation of the scope of audit. In the meantime, the characteristics of accounting firms were divided into three: the size(or reputation) of the accounting firm, the

organization of human resources and operation method.

The results of this study are summarized as follows: First, a graph of causal relationship was drawn through GBN, and as a result, of the characteristics of accounting firms, affiliation with a global accounting firm, the number of branch offices and the partner ratio of the CPA belonging to it had direct causal relationships with audit engagement risks. However, the size of the accounting firm, the public company ratio, whether it is an one-firm, the auditor's expertise and average audit experience did not have direct causal relationships with audit engagement risks.

In addition, causal relationships between the characteristics of accounting firms could be drawn, too. In other words, affiliation with a global accounting firm had direct causal relationships with the number of branch offices, the size of the accounting firm, the public company ratio, whether it is an one-firm and the partner ratio of the CPA belonging to it, and the partner ratio of the CPA belonging to it had direct causal relationships with whether it is an one-firm, the auditor's expertise and average audit experience. Second, through Markov Blanket, the causal relationship graph drawn using GBN, sensitivity analysis(What-If) was conducted. Especially, how the posterior probability of each explanatory variable changes when the prior probability of variables in a direct causal relationship with audit engagement risks was analyzed to present the ultimate impact on dependent variables.

This study presents the characteristics of accounting firms, which affect audit engagement risks, using Bayesian Network through a causal relationship graph. This causal relationship graph can help related institutions supervising accounting firms efficiently perform audit engagement management. In addition, this study will be used to make a policy and improve the system necessary for the improvement of the audit quality by presenting the characteristics of accounting firms in a direct causal relationship with audit engagement risks. Moreover, checking how the posterior probability of audit engagement risks changes when the specific prior probability value changes through sensitivity analysis will be a tool of supervisory institutions supervising accounting firms for rational decision-making in establishing a policy to improve the audit quality. Like this, the causal relationship graph using Bayesian Network and sensitivity analysis conducted in this study are the point of contribution of this study, which could not be seen in the existing studies related to the audit quality of accounting firms.

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국문요약

베이지안 네트워크를 기반으로 한 회계법인의 속성과 감사계약체결위험간의 관계†

선은정* · 박성진**

재무정보의 신뢰성을 높이는 가장 좋은 방법 중 하나는 양질의 감사품질을 유지하는 것이다. 양질의 감사품질을 유지하는 첫 번째 단계는 감사계약체결위험을 낮추는 일일 것이다. 이에 본 연구에서는 베이지안 네트워크를 활용하여 회계법인의 속성과 감사계약체결위험간의 관계에 대해 살펴보고자 한다. 이를 위해 감사계약체결위험에 영향을 미치는 최소한의 설명변수 집합인 마코브 블랭킷을 제시하였으며, 도출된 설명변수간의 관계를 바탕으로 민감도분석을 통해 회계법인의 속성과 감사계약체결위험간의 관련성을 분석하였다. 기존의 선행연구에서 사용한 회귀분석은 독립변수와 종속변수간의 선형성을 가정하였기 때문에 독립변수간의 관계를 도출하는데 한계점이 있었다. 이에 본 연구에서는 일반 베이지안 네트워크를 바탕으로 변수간의 상호의존성을 파악하고 각 변수들이 감사품질에 영향을 미치는 감사계약체결위험에 어떠한 영향을 미치는 지를 검토하였다.

본 연구의 결과는 감독기관이 감사계약체결위험을 제대로 관리하지 못한 감사인을 사전에 식별할 수 있기 때문에 감리의 효율성을 높일 수 있다. 또한 본 연구는 감독기관이 감사품질과 관련된 회계법인의 속성을 파악함으로써 감리제도의 미비점을 개선할 수 있다는 점에서 공헌점이 있을 것이다.

핵심주제어: 감사계약체결위험, 회계법인의 속성, 베이지안 네트워크, 민감도분석

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