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Comparison of Analysis Performed By Classical Approach and Bayesian Approach in Auditors' Decision Making Process*

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Abstract

Auditor is in a decision maker position in many phases of an audit process. The increase of auditor's effectiveness and productivity also increases all of the success of the process. Therefore, the analysis of the phases, which auditor is being a decision maker (judgment field) is very important. These analyses can be performed by some statistical methods that are based on the classical approach or the Bayesian approach.

In this study, the same model and data which is used in doctorate dissertation named "The Bayesian Approach in Objectifying of Auditor's Judgment and an Application". The variables that can be effective in decisions in the pre-engagement investigation and client acceptance phase are analyzed both by classical approach and Bayesian approach (By using logistic regression model). In conclusion, analyzing the complex structures about decision making that are presented in the judgment fields can be possible by Bayesian approach due to the fact that Bayesian approach can analyze both objective and subjective components. Consequently, auditor's subjective judgment is included into the audit process by being objective and therefore the process is strengthened.

1. Introduction

In recent years, especially because of some corporate scandals, requirement for more effective and efficient audit is dramatically increased. Audit procedures can never exclude auditor's subjective judgment in spite of the technological capability in our digital age. However it's also obvious that audit procedures that are implemented by auditor's judgment comprised of experience, interpretation ability, perception, intuition cannot be always sufficient

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and significant. It needs to be objectified. (The word "judgment" will be used for auditor's experience, interpretation ability, perception, intuition, opinion, and prediction in the remainder of this paper). Consequently the objectifying of auditor's judgment will meet the requirement for more effective and efficient audit.

Audit process may be discussed as a decision making process. In this process, it's a fact that auditor has to make some decisions by using both objective data and subjective judgment. In the face of current conditions, objective data can be used very effectively. Therefore if subjective judgment can also be used logically and effectively, all the process will be strengthened. For this aim, judgment fields should be analyzed. To this end, some statistical methods can be used to analyze judgment fields

Statistics can be divided into two different schools: Classic-statistical school and Bayesian school. The first group is also called frequentistic, Berkeley or objectivistic statistics; while the second group is called subjectivistic. These approaches have different philosophies (Ekici, 2009; Wille, 2003). Furthermore, they have many differences related to some technical subjects. Accordingly, analyzes that are based on classical approach and Bayesian approach vary from each other. The main differences between these two approaches are summarized in Table 1: (Carlin and Louis, 2000;Ekici, 2009; Gill, 2002; Wille,2003)

Table 1 Differences between Bayesian Approach and Classic Approach

BAYESIAN APPROACH	CLASSIC APPROACH
Differences in Main Manners of the Approaches'	
It is based on inductive method.	It is based on deductive method.
It is in accordance with the principal of causality's probabilistic interpretation.	It is in accordance with the principal of causality's deterministic interpretation.
It embraces subjective probability definition.	It embraces objective probability definition.
It is based on to reach probability of "one" (Verification)	It is based on to reach probability of "zero" (Falsification)
Differences in Understanding of Decision-making Process	
Ambiguity in decision process is tried to be explained by probability.	Ambiguity in decision process is tried to be explained by a deterministic point of view.
Differences in Methods and Analyses	
"Parameter" means a variable that has a probability distribution.	"Parameter" means an unknown constant.
Arithmetical mean of posterior probability means point estimation of the parameter.	Best estimation of a parameter obtains from results of experiments.
It is interested in the probability of a certain interval's inclusion of the posterior distribution's mean. This certain interval named a "credible interval".	It is interested in a certain interval's inclusion of the parameter's real value. This certain interval named a "confidence interval".
It examines probabilities related to the hypothesis and compares the hypothesis.	It examines if the parameter is in related interval or not. Hypotheses are tested.
It can benefit from some priors like expert's opinion, similar or previous data etc…	It cannot benefit from some priors like expert's opinion, similar or previous data etc…

As is shown in Table 1, there are some *differences in manners of the approaches'* between Bayesian and classical approaches. First of all, Bayesian approach is based on an inductive method, while classical approach is based on a deductive method. Furthermore, Bayesian approach is in accordance with the principal of causality's probabilistic interpretation while classical approach is in deterministic interpretation. Another important difference is that Bayesian approach embraces subjective probability definition [c] while classical approach embraces objective probability definition[d]. Also Bayesian approach is based on to reach probability of "one" (verification) but, It is based on to reach probability of "zero" (falsification).

Furthermore, there are *differences in understanding of decision-making process* between them. Ambiguity in decision process is tried to be explained by probability in Bayesian approach. But in classical approach ambiguity in decision process is tried to be explained by a deterministic point of view.

In addition, they have *differences in methods and analysis*. In the Bayesian approach "Parameter" means a variable that has a probability distribution but in classical approach it means an unknown constant. Arithmetical mean of posterior probability provides the point estimation of the parameter and it is interested in the probability of a certain interval's inclusion of the posterior distribution's mean. This certain interval named a "credible interval" in Bayesian approach. However, in classical approach, best estimation of a parameter obtains from results of experiments and it is interested in a certain interval's inclusion of the parameter's real value. This certain interval is named as "the confidence interval". Probabilities related to the hypothesis are examined and the hypotheses are compared in Bayesian approach whereas in classical approach it is examined whether the parameter is in related interval or not. Besides hypotheses are tested. Finally, Bayesian approach benefits from some priors like expert's opinion, similar or previous data, while classical approach does not.

In this study, it is asserted that judgment fields can analyze truly and logically by the methods that are based on Bayesian approach. Section 2 reviews the literature about Bayesian approach in auditing and previously. Then hypotheses are developed. Section 3 discusses the data, performs the analyses about auditor's decision in pre-engagement phase and argues the findings. Section 4 concludes.

2. Literature Review and Hypotheses

2.1. Bayesian approach and methods in audit

Bayesian approach is based on a very old and long-established theorem named "Bayes Theorem". Methods about Bayesian approach were not practicable in the beginning. In later years with the use of Markov Chain Monte Carlo-MCMC they become practicable (Ghosh et al.,2006). Now studies about using Bayesian approach in the audit process is increasing. Abdolmohammadi examines the methods based on Bayesian approach and noticed that subjective probability assessments that can be made by Bayesian approach may provide many advantages in audit process (Abdolmohammadi, 1985). Abdolmohammadi compares some basic techniques that can be used for prior probability assessments and emphasizes the importance of determining the appropriate technique in another paper. In his study, Abdolmohammadi comes to a conclusion that probability density function, which is one of the techniques that are compared (Abdolmohammadi, 1987). Moors examines determination of upper confidence limit by different methods. As a result, it is found Bayes' upper limit less conservative (Moors, 1983). Dutta et al. discusses how audit evidence can aggregate under the probability theory (Dutta et al. 1993). Wille examines using of the Bayesian decision analyses in audit process. He emphasizes that Bayesian analysis can provide very important advantages especially in dealing with cost benefits (Wille, 2003). Batenburg and Kriens emphasize on the advantages of Bayesian inference. They try to find the answer of "*How can he objectively specify his prior[e] knowledge about the population? and How can he objectively interpret posterior probabilities so that he can decide how to audit this population?*" A discovery sampling model is used in their study. Consequently, they state that Bayesian version of methodology has important advantages (Batenburg and Kriens, 1989). Dutta and Srivastava compare some measures about strength of evidence.

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[c] "A subjective probability describes an individual's personal judgment about how likely a particular event is to occur. It is not based on any precise computation but is often a reasonable assessment by a knowledgeable person." (http://www.stats.gla.ac.uk/steps/glossary/probability.html, 02.03.2014)

[d] "The probability that an event will occur based an analysis in which each measure is based on a recorded observation, rather than a subjective estimate". (http://www.investopedia.com/terms/o/objective-probability.asp, 02.03.2014)

[e] Before aggregate some data about a case, some previous (objective or subjective) knowledge can use for determining prior probability. These previous (objective or subjective) knowledge named as prior. It will use in this meaning in the reminder of this paper.

As a result, they point out that likelihood ratio is an appropriate measure of strength of evidence. They highlight that the findings can help to aggregate evidence in Bayesian framework (Dutta and Srivastatva, 1996). Gillett examines the role of evidence and considers an alternative paradigms in audit planning. Then he develops an auditing postulate within the framework of the valuation network. Consequently, it is noted that the study provides Bayesian probability in audit planning as a new proposal (Gillett, 1996). Berg proposes a simple, more flexible Bayesian technique which can integrate judgment to the process. As a result, some advantages of it are explained and it's applicability is emphasized (Berg, 2006). Bağcı analyzes using of the data mining technique to struggle with fraud. He argues that Bayes networks can be used effectively in fraud auditing.[f] Demski and Seieringa suggest a model that is based on Bayesian approach for the audit choice problem. In some phases of the audit process, especially where auditors need to make some choice there is a requirement for an approach that can include both auditor's and client's opinions. Demski and Seieringa explain that their model is more advantageous because it meets the requirement for such an approach (Demski and Seieringa, 1974). Srivastava et al. suggest a new formula based on Bayesian approach for assessing fraud risk. It is pointed out that the formula in their study can used in audit process effectively. Furthermore, it is asserted that the formula may simplify the assessment of fraud risk (Srivastava et al., 2008). Erdoğan notes that auditor can combine objective data that gained from sampling and subjective judgment and comes a more reliable and logical conclusion thanks to the Bayesian approach. In this study, a hypothetical example is realized about how auditors can use Bayesian approach and explain the main logic of it (Erdoğan, 2006). Felix, Jr. and Grimlund proposed an alternative sampling model in a Bayesian framework. It's expressed that by this model auditor can combine his/her subjective judgment (possible priors) with sample evidence (Felix, Jr. and Grimlund,1977). Hernandez-Bastida and Vazquez-Polo explain the usage of Quasi-Bayesian model for dollar unit sampling. They express that the model is applicable by generating a probability mass function on the amount of error in a population. Therefore, some priors can be used in dollar unit sampling by using this model (Hernandez-Bastida and Vazquez-Polo, 1997).

In conclusion, the previous studies in the literature are in favor of the Bayesian approach and its applications in different fields of audit.

2.2. Development of the hypotheses

The main characteristic of Bayesian approach is taking into consideration the subjective judgment as priors. So it can combine the objective data and subjective judgment and it is expected to give an opportunity to analyze the judgment fields that auditor has to make decision in audit process.

As is known, audit process consists of some phases. The basic phases of audit are listed below: (Erdoğan, 2006)

- Pre-engagement and client acceptance
- Audit planning
- Assessment of internal control
- Applying of substantive tests
- Completing the audit
- Audit reporting

In this context, all the judgment fields in the different audit phases can be analyzed by Bayesian approach, but in this study the first one (Forming a general opinion about the cooperation) will be analyzed. In other words the pre-engagement and client acceptance phase of the audit process will be analyzed. The decision that auditor makes in pre-engagement and client acceptance phase is considerably important because this decision affects auditor's reputation and it constitutes the beginning of the audit process.

Accordingly, variables that can be effective in decisions in the pre-engagement investigation and client acceptance phase are determined both by academicians and auditors in this study. Then nine hypotheses are developed.

H1: To be in finance sector increases the probability of auditor's acceptance.
H2: To have an understanding about corporate governance increases the probability of auditor's acceptance.
H3: Not to have any corruption in corporation increases the probability of auditor's acceptance.
H4: Not to have any important litigation increases the probability of auditor's acceptance.

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[f] http://www.alomaliye.com/2009/hasan_bagci_yolsuzlukla.htm (15.12.2011)

H5: To have an unqualified opinion from previous auditor increases the probability of auditor's acceptance.

H6: To have a positive opinion from related third parties increases the probability of auditor's acceptance.

H7: Not to have any problem about management's understanding of having no restriction on auditor increases the probability of auditor's acceptance.

H8: Not to have a relation between corporation and auditor that can affect auditor's independency increases the probability of auditor's acceptance.

H9: To have an active internal audit department and/or internal audit committee increases the probability of auditor's acceptance.

The hypotheses as written above are examined by both classic statistical approach and Bayesian approach.

3. Methodology

3.1. Research Goal

In this study it is aimed to compare the analysis of pre-engagement and client acceptance phase which is the first phase of the audit by classical approach and Bayesian approach. As mentioned before, it is asserted that judgment field's analyses can be realized by Bayesian approach correctly and logically.

3.2. Sample and Data Collection

In an international audit firm 160 audit works are examined face to face interview with 16 auditors. Each of the auditors answered the questions about her/his 10 different audit works that have been already finished or that have been rejected at the beginning. Some questions about hypothesis and auditor's judgment about the probability of acceptance are asked. Consequently, data about auditors' judgments, decisions and status relating to variables are obtained for these 160 audit works. Data obtained from interviews are analyzed both through the WinBUGS 1.4 (Bayesian Inference Using Gibbs Sampling) and SPSS 15.0 (Statistical Package for the Social Sciences). To analyze the date a logistic regression model is used. And the results are compared.

3.3. Analysis and Results

Auditor's not obliged to accept all the audit proposals. They have to take into consideration audit risk carefully and investigate the related corporation delicately. In pre-engagement phase auditors' judgment is extremely important. Because they can have less objective data or evidence in this initial phase in other word uncertainty is too much in this phase. Furthermore they have to think about their reputation especially in the beginning. And also if they develop their judgment logically and truly, all audit process's effectiveness and efficiency will increase. Because if they accept the client, their judgment which is developed in the pre-engagement phase will affect the other phases especially audit planning phase. So this phase needs to be analyzed truly and logically. In this study a research model is developed firstly and then possible analysis approaches are compared to analyze the pre-engagement phase in audit process.

The research model is shown in Table 2. Dependent variable and all the independent variables are categorical variables. Dependent variable's and independent variables' coding system can be seen from the Table.

Table 2 Research Modal

Prior Probability Distribution	
Distribution of the model that is explained the relation between auditors judgment and the variables	
Dependent Variable	
Auditor's decision about acceptance or rejection of the client(Y)	Accept=1/Reject=0
Independent Variables	
A. Cooperation's features	
1. Sector (sktr)	Finance=1/Except finance=0
2. Understanding of cooperate governance (ky)	Positive=1/Negative=0
3. Existence of fraud (suis)	Absent=1/Present=0
4. Existence of an important litigation (dv)	Absent=1/Present=0

B. Third parties		
5. Opinion of previous auditor (dntc)	Positive=1 (Positive expression in meeting and unqualified audit report)/ Negative=0 (Negative expression in meeting and/or qualified/adverse/disclaimer audit report)	
6. Opinion of related third parties (uck)	Positive=1/Negative=0	
C. Expected coherence between corporation and auditor		
7. Management's understanding of having no restriction on auditor (kst)	Problem-free=1/Problematic=0	
8. Existence of relation between corporation and auditor that can affect auditor's independency (bgm)	Absent=1/Present=0	
9. Activation of internal audit department and/or internal audit committee (icd)	Active=1/Passive=0	

According to Table 2, question about the probability of client acceptance in other words their judgment is asked to the auditors. This question is extremely important for Bayesian analyze because answers will provide the prior probability distribution which is distinguishing constituent of Bayesian analyze. On the contrary, the distribution about judgment cannot be used in the analyses that are based on classical approach. So it's impossible to include judgment into the classical analyses. In Table 3 frequency and percentage of dependent variable's and independent variables' which are used both Bayesian and classical analyses are shown depending on the face to face interviews. Afterwards in Table 4 frequency and percentage of auditors' judgments are shown depending on the same interviews.

Table 3 Variables' Frequency and Percentage

DEPENDENT VARIABLE		Frequency	Percentage
Auditor's decision about acceptance or rejection of the client(Y)	Rejection	21	13.1
	Accept	139	86.9
INDEPENDENT VARIABLES		**Frequency**	**Percentage**
A. Cooperation's features			
1. Sector	Except finance	100	62.5
	Finance	60	37.5
2. Understanding of cooperate governance	Negative	36	22.5
	Positive	124	775
3. Existence of fraud	Present	4	2.5
	Absent	156	97.5
4. Existence of an important litigation	Present	10	6.3
	Absent	150	93.8
B. Third parties			
5. Opinion of previous auditor	Negative	19	11.9
	Positive	141	88.1
6. Opinion of related third parties	Negative	8	5.0
	Positive	152	95.0
C. Expected coherence between corporation and auditor			
7. Management's understanding of having no restriction on auditor	Problematic	13	8.1
	Problem-free	147	91.9
8. Existence of relation between corporation and auditor that can affect auditor's independence	Present	6	3.8
	Absent	154	96.3
9. Activation of internal audit department and/or internal audit committee	Passive	60	37.5
	Active	100	62.5

Table 4 Auditors' Judgment' Frequency and Percentage

AUDITOR'S JUDGMENT ABOUT CLIENT ACCEPTANCE (Yyrg)	Frequency	Percentage
0 % ≤ Yyrg ≤25%	9	5.6
25%< Yyrg ≤50%	33	20.6
50%< Yyrg ≤75%	23	14.4
75%< Yyrg ≤100%	95	59.4

As shown in Table 3, 21 (13.1%) of 160 audits which are examined are rejected and 139 (86.9%) of them are accepted. While looking at the variables about "*cooperation's features*" it is seen that 100 (62.5%) of these audits are performed in the corporation except form finance. Correspondingly 60 (37.5%) of them are performed in the corporation from finance. In 36 (22.5%) of them it's noted that there are some problem about the understanding of cooperate governance and in 124 (77.5%) of them there aren't any problem about it. In 4 (2.5%) of them that is known that a fraud was committed. On the contrary, in 156 (97.5%) of them there is no information whether a fraud was committed or not. 10 (6.3%) of them are a party to an important litigation and there is no important litigation in 150 (93.8 %) of them.

While looking at the variables about *"third parties"* it is seen that previous auditors' have qualified/adverse/disclaimer audit report and/or a negative expression about cooperates in the meetings in 19(11.9%) of them. Conversely, in 141(88.1%) of them, previous auditors' have unqualified audit report and they have a positive expression in the meetings. Additionally, opinions of related third parties are negative in 8(5%) of them. In 152 (95%) of them these opinions are positive.

Correspondingly, while looking at the variables about *"expected coherence between corporation and auditor"* it is seen that in 13(8.1%) of them have some problem about their management's understanding of having no restriction on auditor but 147(91.9%) of them don't have any problem about their management's understanding of having no restriction on auditor. There is a relation between corporation and auditor that can affect auditor's independence in 6(3.8%) of them but there isn't any relation like this in 154(3.8%) of them. Lastly, 60(37.5%) of them there are some problem about activation of internal audit department and/or internal audit committee but 100(62.5%) of them don't have any problem. Their internal audit departments and/or internal audit committees are active.

In Table 4, auditors' judgments frequency and percentage shown in intervals. According to this;
- Auditors' judgments' about client acceptance is maximum 25% in 9(5.6%) audits which are examined.
- Auditors' judgments' about client acceptance is between 25% and 50% in 33(20.6) audits which are examined.
- Auditors' judgments' about client acceptance is between 50% and 75% in 23(14.4) audits which are examined.
- Auditors' judgments' about client acceptance is between 75% and 100% in 95(59.4) audits which are examined.

Auditors' judgments' frequency and percentage indicated that auditors' judgments' about client acceptance is strong. This finding needs to be taken into consideration with auditor's decision about acceptance or rejection of the client (dependent variable). Also accepted audit works are more than rejected. So it can be said that auditors' judgment and decision are coherent and consistent to each other firstly.

After gathering the data as explained above, Bayesian analyze is run at first by using WinBUGS. To analyze this data with Bayesian approach, it is began with the analyzing the relation between the judgments and independent variables (Prior model). This model provides us a distribution that will use as a prior probability distribution in the analysis of the relation between the dependent variables and independent variables (main model). This prior modal is analyzed by Bayesian regression model. Because dependent variable is continuous. In this analysis 500,000 iteration is performed. Equation related to the prior model is:

$$Y_{yrg} = \beta_{0yrg} + \beta_{1yrg}sktr + \beta_{2yrg}ky + \beta_{3yrg}suis + \beta_{4yrg}dv + \beta_{5yrg}dntc + \beta_{6yrg}uck + \beta_{7yrg}kst + \beta_{8yrg}bgm + \beta_{9yrg}icd$$

Equation related to the main model is:

$$Y = \beta_0 + \beta_{1sktr} + \beta_{2ky} + \beta_{3suis} + \beta_{4dv} + \beta_{5dntc} + \beta_{6uck} + \beta_{7kst} + \beta_{8bgm} + \beta_{9icd}$$

This main modal that explained the relation between the dependent variables and independent variables is analyzed by Bayesian logistic regression modal because dependent variable is categorical. In Table 5, the findings of main modal which has the prior probability distribution are shown. Thanks to using of prior probability distribution in a Bayesian analysis, judgment can be included into the analysis. In this analysis 500,000 iteration is performed again.

Table 5 Bayesian Analysis Finding

Variable	Mean β	Standard Deviation	MC Error[*]	Odds Ratio
Constant	-3.459	0.870	0.0019	
1.sktr	-0.574	0.280	0.0001	0.585
2.ky	0.467	0.316	0.0002	1.677
3.suis	-0.152	0.736	0.0014	1.124
4.dv	0.614	0.495	0.0006	2.088
5.dntc	0.445	0.406	0.0004	1.694
6.uck	1.084	0.621	0.0009	3.589
7.kst	1.417	0.521	0.0006	4.724
8.bgm	2.337	0.598	0.0010	12.370
9.icd	0.287	0.284	0.0002	1.388

* MC Error < 0.05

In the findings of the analysis it is shown that the most effective variable on the auditors' decision about client acceptance or rejection is *"existence of relation between corporation and auditor that can affect auditor's independence"* (Bgm β_8 = 2.337). In other words if there is not any relation between corporation and auditor that can affect auditor's, this situation will have an important contribution on the auditors' decision of client acceptance.

Other variables can be grade in accordance with their effects on auditors' decision when auditors' judgments are priors:

- Management's understanding of having no restriction on auditor ($\beta7=1.417$)
- Opinion of related third parties ($\beta6= 1.084$)
- Existence of an important litigation ($\beta4= 0.614$)
- Understanding of cooperate governance ($\beta2= 0.467$)
- Opinion of previous auditor ($\beta5= 0.445$)
- Activation of internal audit department and/or internal audit committee ($\beta9= 0.287$)
- Existence of fraud ($\beta3= -0.152$)
- Sector ($\beta1= -0.574$)

Odds ratios can be interpreted like coefficients (β):

- The cooperation's which has no relation that can affect auditor's independence between cooperation and auditor, acceptance probability by auditor is 12.37 times more than the cooperation's which has such a relation.
- The cooperation's which has no problem with management's understanding of having no restriction on auditor, acceptance probability by auditor is 4.724 times more than the cooperation's which has such a problem
- The cooperation's which has positive opinion from related third parties, acceptance probability by auditor is 3.589 times more than the cooperation's which has negative opinion.
- The cooperation's which is a party of an important litigation acceptance probability by auditor is 2.088 times more than the cooperation's which has not a party.
- The cooperation's which has a unqualified audit report and positive expression in the meeting with previous auditor, acceptance probability by auditor is 1.694 times more than the cooperation's which has a qualified/adverse/disclaimer audit report and/or a negative expression about cooperate in the meetings.
- The cooperation's which is formed a positive impression about understanding of cooperate governance, acceptance probability by auditor is 1.677 times more than the cooperation's which is formed a negative impression.
- The cooperation's which has an active internal audit department and/or an internal audit committee, acceptance probability by auditor is 1.388 times more than the cooperation's which has a passive internal audit department and/or an internal audit committee.
- The cooperation's which has no information about if there was a fraud, acceptance probability by auditor is 1.124 times less than the cooperation's which is known as there was at least a fraud.
- The cooperation's which is in finance sector acceptance probability by auditor is 0.585 times less than the cooperation's which is in another sector except finance, acceptance probability by auditor.

Secondly, a logistic regression analysis based on classical approach is run by using SPSS. The model explains the relation between the dependent variables and independent variables The equation of the model is same with the main model in the Bayesian analysis:

$Y = \beta_0 + \beta_{1sktr} + \beta_{2ky} + \beta_{3suis} + \beta_{4dv} + \beta_{5dntc} + \beta_{6uck} + \beta_{7kst} + \beta_{8bgm} + \beta_{9icd}$

The findings of the model are shown below, in Table 6.

Table 6 Classic Analysis Findings

Variable	β	S.E.	Sig. (p)	Exp(B) (Odds Ratio)
Constant	-8.074	2.378	.001	
1.sktr	-1.816	.913	.047	0.163
2.ky	-1.034	1.016	.309	0.356
3.suis	-.771	1.601	.630	0.463
4.dv	2.872	1.092	.009	17.681
5.dntc	1.308	.854	.125	3.700
6.uck	1.546	1.273	.224	4.694
7.kst	3.315	1.174	.005	27.520
8.bgm	4.903	1.423	.001	134.648
9.icd	.010	.850	.991	1.010

As is seen clearly, the findings above in Table 5 and Table 6 differ from each other. Because auditors' judgments cannot be included in classical analysis. The ranking of variable parallel (not same) but coefficients and odds ratios are different. They are exaggerated in the classical analysis. Especially it is considered that the findings about corporate governance can be fallacious (negative coefficient). Moreover as shown above in Table 6, odds ratio related to "existence of relation between corporation and auditor that can affect auditor's independence" is 134.648. This means that the cooperation's which has no relation between corporation and auditor that can affect auditor's independence, acceptance probability by auditor is 134.648 times more than the cooperation's which has such a relation, acceptance probability by auditor. This expression is so exaggerated. According to this fallacious expression, the other variables have no effect on the dependent variable. Because the variable about auditors' independence is confiscatory effective. As is known the general aim of the classical approach is a generalization. In this context, it has to be checked the conditions of normal distribution and detected multicollinearity. Also significance value is important to "test" the hypotheses ($p > 0.05$ null hypothesis is accept). But in Bayesian approach generalization is not the main aim. Bayesian approach makes iterations and work with chains. Some situational analyses can be run successfully by Bayesian approach. Judgment fields can be analyzed with situational analyses because as explained they are based on judgment which is specific for a situation. In short Bayesian analysis is appropriate for analyzing the auditor's judgment fields.

4. Conclusion

Judgment fields are affected by some variables that have subjective features. Therefore, these features should be objectified by including them into the analyses of these judgment fields. This study asserts that the analyses which cannot include the judgment are inappropriate and incompetent for auditor's decision-making process. As explained in this paper, it is not possible to include judgment into analysis with employing classical approach however, Bayesian analysis can include judgment. This feature about judgment is important because the analyses of the judgment fields truly and logically, increase auditors' awareness about decision-making and the efficiency and effectiveness of audit process. Bayesian approach can be considered as a holistic approach that can be used in general rather than being just a method, a technique or a standard. The Bayesian approach subjective judgment adds value to auditor's decision-making process. Recently, there are many different methods, techniques and applications based on Bayesian approach. Thus, Bayesian approach is able to apply all the phases of the audit for different aims as a general approach. As a result, the study emphasis that subjective judgment is not a weak point. It can be turned into a strength of the audit process by including into the process and objectified by Bayesian approach. Besides, improving all the audit process' efficiency and effectiveness, employing Bayesian approach to the all auditors' decision-making process affects the success of management. An improvement in the audit process' efficiency and effectiveness also affects the managements' efficiency and effectiveness. Therefore this study suggests the Bayesian approach as a general approach for auditing.

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