The Analysis of Good Profitability Governance Using Markov Chain in Small Business

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Abstract: *Business has indeed become a thing often created by society. Everyone can manage small businesses with little capital. However, often to run a business often has an obstacle due to poor governance. Many small businesses are ultimately closed. Good governance in the company is a system that is applied so that everything associated with governance can work well. In small businesses, often the governance is not executed perfectly to produce a minimal market share. Businesses do not know what constraints occur in their companies, so the company gradually decline, especially the financial decline. Good corporate governance makes financial improvements. Markov Chain can predict the state of the company in some future period. This method analyzes the survey results from a given period based on the transition probabilities of the participating respondents. The implementation of Markov Chain on good governance can improve the quality of corporate governance in the future to increase corporate profits.*

Key Words: *Good Governance, Markov Chain, Business, company.*

1. INTRODUCTION:

Small business is a grouping of business types In the grouping itself consists of entrepreneurs as a micro business group. Business actors as small, medium or large business groups have the same problems facing the challenge of developing their business [8]. There are many problems that companies often encounter. Inaccurate salary payments, high operating costs, delays in payments to suppliers, inefficient investments, inadequate promotion of targets are a problem that constrains the company. On the other hand, the financial statements that have not been organized because the records are still using the information system that is perfunctory. Apart from the company, barriers also come from outside parties. Customer complaints and customer response such as delayed or incorrect shipments of goods, unproductive human resources, overlapping activities, loss of market share, and inventory over demand are common in companies due to lack of quality control.

The biggest problem in good governance is the separation between ownership and control of a company. Shareholders are separate from the company's management of large companies. This separation resulted in requiring a full report on the company's ordinances. It aims to keep the condition of the business to run smoothly. Shareholders with the management side often have different goals that result in agency trouble. The implementation of governance is mostly done in large enterprises, to be able to solve the agency problem. Businesses in small companies are the management side too. Small businesses rarely share shares, so business controls will automatically be in the owners' hands. It is the reason why many small businesses do not implement corporate governance.

The advantage of a company can be seen from how good the governance of the company [3]. To analyze the problem, it takes several methods to assess the company for some future period. Markov Chain is an algorithm that can assess the state of a company going forward. This method works by collecting data one period and the number of data changes in each criterion. Data migration will result in a business performance increase or decrease. Based on survey data obtained in a period, this can be processed and obtained prediction results for some subsequent periods. The performance is expected to be an assessment of the company so that the company can improve the system of governance and management so that the resulting profit better in the future.

2. THEORIES:

2.1 Good Governance

The term Good Governance comes from a European, Latin, parent Gubernare that is absorbed by English into governance, which means steer, direct, or rule. The main use of this term in English is to rule with authority or govern with authority. Governance is first used in the corporate or corporate world. The professional management that was introduced after World War II with the basic principle of separating ownership with management made every corporation a great, healthy and profitable business [4]. This movement began massively in America, especially after

the titians of entrepreneurs experienced a major failure to maintain the greatness of maintaining the greatness of its business.

Good Governance is the establishment of a company's management with specific vision and mission. Every company has its policy in developing its governance system. A management organization is responsible for promoting solid and responsible development that is consistent with the principles of democracy and efficient markets. The objectives of good governance are to avoid improper investment allocation of investment funds and the prevention of corruption both politically and administratively running the budget discipline and the creation of the legal and political framework for the growth of business activities. The concept that refers to the process of achieving a mature and accountable decision is the goal of good governance [5].

There are three characteristics of good governance, such as:

- Pluralism. It has become an eternal rule in business. It serves to raise the science of society with constructive differences. It is a motivator for creating dynamic creativity. Cosmopolitan civilization will be created if human beings have an inclusive attitude and ability to adapt to the surrounding environment by maintaining a true identity of the authentic parameters of religion among human beings.
- Tolerance. It serves to keep good governance safe and peaceful. It serves to preserve a culture of governance based on applicable rules. It is not only to improve corporate governance but also to appreciate other corporate governance, especially if there is cooperation between companies.
- Democracy. It is not just freedom and competition; democracy is also an option to jointly build and strive for the progress of the company in gaining market share. This principle must be enforced so that the competition between companies is fair and wise. It has a broad influence in the process of making decisions and determining the future fate of the company.

2.2 Markov Analysis

Markov analysis is a form of a quantitative method used to calculate the possibility of change in value in the next period [1]. This change is based on the results obtained in the past. Markov Chain is a method that studies the properties of a variable at this time with the reference values that existed in the past. It aims to predict the results of calculations in the next period. The goal is to predict the state of a company, either profit or non-profit. Markov analysis is used to look for future probabilities, by analyzing probabilities at the moment [2][7]. One of the goals of this method is to predict future economic conditions. This technique has a variety of applications in the business world, including market share analysis, prediction of losses, prediction of new admissions at universities, and determine whether a machine will be damaged in the future. It is a prediction technique but can be done to optimize the company based on the value obtained from the calculation. Some possibilities may occur from the analysis. Markov analysis can be applied to other circumstances as well. Markov analysis works as a decision support system. Still, Markov does not produce a decision or ranking; it only provides the values of calculation [7]. All types of actions and decisions are dependent on the decision maker. It only helps the decision maker to determine the next step.

The Markov Process Model was developed by a Russian mathematician named A.A. Markov. In 1906, he who was a student of Chebyshev proposed a theory of dependence on random variables of a random process known as the Markov process. The Markov process is a past stochastic process not affect the future when it is now known. Several conditions must be met to apply Markov chain analysis, such as:

- The number of transition probabilities for an initial state of the system is equal to 1.
- Those probabilities apply to all participants in the system.
- Constant transition probability over time.
- Conditions are independent conditions all the time.

3. METHODOLOGY:

In establishing the Markov Chain to assess corporate governance, there are several criteria to be used in the assessment. The following are the criteria used in assessing firm predictions for a given period.

1. Participation
   Every employee has a say in decision-making, either directly or indirectly. Participation like this is built by freedom of association and speaking and participating constructively.

2. Fairness
   The legal framework should be fair and undertaken indiscriminately, especially the law for human rights. Every employee has the right to defend his decision.

3. Transparency

   It is built on the freedom of information flow directly to be received by those in need. Information should be understandable and monitored by the company on a regular basis.

4. Responsiveness
   Companies must be quick and responsive in the face of any problems.

5. Orientation
   Good governance intermediates different interests to make the best choices for the broader interests both regarding policies and procedures.

6. Effectiveness
   Processes and institutions produce by what has been outlined by using the best available resources.

7. Accountability
   The decision makers within the company are responsible employees and consumers. Leaders and the public should have a broad and far-sighted perspective of good governance and human development in line with what is needed to improve corporate earnings.

The following are the names of business people and the criteria used in Markov Chain calculations.

Criteria 1 = Participation (C1)
Criteria 2 = Fairness (C2)
Criteria 3 = Transparency (C3)
Criteria 4 = Responsiveness (C4)
Criteria 5 = Orientation (C5)
Criteria 6 = Effectiveness (C6)
Criteria 7 = Accountability (C7)

B1 = Business 1
B2 = Business 2
B3 = Business 3
B4 = Business 4
B5 = Business 5

4. IMPLEMENTATION:

This test involves examples of business people (B1-B5). There are 1000 respondents to five small companies where each respondent chooses the one company they think best. The selection of companies is based on only one of the best criteria according to the respondents. Table 1 is the survey result of the respondents.

Table 1. Respondents data

	C1	**C2**	**C3**	**C4**	**C5**	**C7**	**C7**
B1	31	23	17	24	24	20	24
B2	12	45	12	27	28	50	37
B3	47	19	26	22	24	44	27
B4	25	32	35	29	36	16	37
B5	30	26	23	24	43	32	29

$$TB = \sum_{i=1}^{n} C$$

TB1 = 163
TB2 = 211
TB3 = 209
TB4 = 210
TB5 = 207

In the following example of corporate displacement, some respondents in the next period go to another company for some reason. It resulted in each company getting acquisition from other consumer companies. Table 2 is an example of the number of transitions a consumer makes to another company.

Table 2. Business acquisition data

	B1	B2	B3	B4	B5
B1	0	10	12	12	12
B2	14	0	16	18	11
B3	24	9	0	6	15
B4	12	22	13	0	31
B5	10	25	25	6	0

Total Acquisition B1 = 46
Total Acquisition B2 = 59
Total Acquisition B3 = 54
Total Acquisition B4 = 78
Total Acquisition B5 = 66

Besides acquisition, the company also suffers losses from losing customers who move to other companies. There are many reasons why consumer moves, but what the company feels is that the transfer is a disadvantage. Table 3 illustrates the consumer movement data obtained by each company.

Table 3. Business loss data

	B1	B2	B3	B4	B5
B1	0	14	24	12	10
B2	10	0	9	22	25
B3	12	16	0	13	25
B4	12	18	6	0	6
B5	12	11	15	31	0

Total Loss B1 = 60
Total Loss B2 = 66
Total Loss B3 = 66
Total Loss B4 = 42
Total Loss B5 = 69

Every company has acquisitions and consumer losses for each period. There is not a single company in the world that has no consumer movement. Failure in governance management may result in the company experiencing temporary losses to facilities offered by a company may cause consumers to be interested in the company. Table 4 is the result of consumer transition to other companies.

Table 4. Transition data

Name	Before	Acquisition	Loss	After
B1	163	46	60	149
B2	211	59	66	204
B3	209	54	66	197
B4	210	78	42	246
B5	207	66	8	265

Not all of the consumers are transitioning. There are some of them that remain on the previous option. Table 6 illustrates the number of consumers who remain and who move to another company.

Table 5. Consumer transition data

	B1	**B2**	**B3**	**B4**	**B5**	**Rb**
B1	**103**	14	24	12	10	**163**
B2	10	**145**	9	22	25	**211**
B3	12	16	**143**	13	25	**209**
B4	12	18	6	**168**	6	**210**
B5	12	11	15	31	**138**	**207**
Ra	**149**	**204**	**197**	**246**	**204**	**1000**

The transition probability is the migration level created in a company. The greatest value is the one where the company undergoes a complete transfer. The values in the following table are the result of the calculation of transition probabilities.

Table 6. Consumer transition data

B1	**B2**	**B3**	**B4**	**B5**
0.632	0.047	0.057	0.057	0.058
0086	0.687	0.077	0.086	0.053
0.147	0.043	0.684	0.029	0.072
0,074	0.104	0.062	0.800	0.150
0.061	0.118	0.120	0.029	0.667

The calculation obtained is the transition probability of good governance at a given period as seen in earlier table. The following result is the good governance value for next period.

$$P2 = \begin{bmatrix} 0.632 & 0.047 & 0.057 & 0.057 & 0.058 \\ 0.086 & 0.687 & 0.077 & 0.086 & 0.053 \\ 0.147 & 0.043 & 0.684 & 0.029 & 0.072 \\ 0.074 & 0.104 & 0.062 & 0.800 & 0.150 \\ 0.061 & 0.118 & 0.120 & 0.029 & 0.667 \end{bmatrix} * \begin{bmatrix} 0.163 \\ 0.211 \\ 0.209 \\ 0.210 \\ 0.207 \end{bmatrix} = \begin{bmatrix} 0.149 \\ 0.204 \\ 0.197 \\ 0.246 \\ 0.204 \end{bmatrix}$$

Table 7. Comparison of good governance value in two periods

Name	**Respondent**	**P1**	**Respondent**	**P2**
B1	163	0.163	149	0.149
B2	211	0.211	204	0.204
B3	209	0.209	197	0.197
B4	210	0.210	246	0.246
B5	207	0.207	204	0.204

Table 7 describes the results of good governance comparison scores in subsequent periods. The calculation explains that there is only one company that has progress in the next period. The company is B4, where the value of 0.210 rises to 0.246 while the other four experienced a decline in the value of good governance. Markov Chain calculations can help a company in assessing the state of its governance system so that the company can think of the next strategy to improve the quality of the company. It is performed to get a greater profit from the results obtained in the previous period.

5. CONCLUSION:

A small business is a simple business that does not require too complex management. However, this kind of business also requires good governance. It affects the value of the opinion that will be obtained. By applying good governance, this business will become more effective. Business actors can predict the profit outcome in some periods by using Markov Chain. The calculation results can be used as a guide in business development. Markov Chain can

not formulate the profit. This method only helps the team of analysts to perform actions in improving consumers in the next period.

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