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Author(s)	中里, 成実
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Analysis of Decision-Making under Uncertainty in Japanese Banking Industry using System Dynamics

Narumi Nakazato
School of Knowledge Science,
Japan Advanced Institute of Science and Technology
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The purpose of this research is to identify the critical factors of management by observing management behavior in the Japanese banking industry based on externally obtained data in a social situation where economic activity is rapidly shrinking due to declining birthrate and aging population. We also clarify the causal relationships and leverage points. Considering Japan's future, Japan will enter the age of population decline, and the size of the economy will inevitably go down. Given this, the banking industry, which was once considered relatively stable, is now under pressure to change to a different management structure. Nonaka (1995) states, "In the coming era, it is necessary to balance both top-down and bottom-up, and it is important to have a broad view and middle-up / down, where the workplace rotates around the middle." But to change the direction a company is heading, it is first necessary to improve its top perspective, that is, its management behavior.

Decision analysis in business behavior is a topic that mainly discussed in the field of business science. Still, it is the most critical decision of a company and is usually confidential. As an alternative, inferring changes in the company's management decisions by developing a company model using data such as sales and profits, which are the results of the company's activities, and observing the differences between actual and simulation results would be possible.

Against this background, we focus on the business behavior of each bank, and clarify how the business behavior will affect corporate performance and what kind of causal relationship each factor has. To pursue a causal relationship, it is necessary to take a bird's-eye view of the entire corporate activity. Therefore, we adapt system thinking (Senge (1990)) for modeling, which can explain companies and society from the perspective of Holism. By simulating the model using the method of system dynamics (Forrester (1961)), we considered the change of various factors that increase or decrease corporate performance from the viewpoint of decision-making theory.

In this study, we clarify the relationship between changes in the external environment and the internal structure surrounding a company using system dynamics techniques for system thinking and continuous simulation. The purpose of this study is to connect causality with constant observation through visualization of behavior and to join decision-making theory. In practice, the banking business will continue to provide the social functions that support people's lives in the future, and the results of examining management decision-making mechanisms will apply to other industries.

This study suggested the following four points.

1. Extraction of factors that influence the decision-making regarding fund management of banks and the mechanism of decision-making
2. Continuous visualization of decision-making behavior
3. Differences in management behavior between banks
4. Recommendations on how to respond to current issues

We examined external and internal factors, identified factors affecting management behavior, and clarified the structure (mechanisms) of decision-making. Besides, the business behavior changed by this mechanism was visualized over time. Although various attempts have been made to explain the structure of companies, no prior literature research has found any research that focuses on decision-making regarding banking investment behavior and clarifies its mechanism in terms of systems thinking.

Keywords: Decision-Making, Managerial Behavior, System Thinking, System Dynamics, Banking Business