Corporate Human Resources Policymaking

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ABSTRACT

Information technology companies in Japan are known for expecting employees to work overtime. Recently, the Japanese national government began actively promoting the improvement of working conditions. In this situation, the measures related to human resources planning in companies are essential factors affecting the overall performance of the organization, including stock prices and recruitment outcomes. Various measures against overtime work have different effects and immediate effectivity. Using System Dynamics simulations, we showed drastic improvement in cutting overtime work when a company outsources its backlogs. (Okada et al., 2019) However, this is not suitable for the situation that the Japanese government are trying to introduce the extension of an upper retirement age in each company. Therefore, this study explores the effects of the extension of the upper age of retirement. The system dynamics simulations show the limitations of this policy.

1. INTRODUCTION

Long working hours in Japan are well known in the world. In particular, the information technology industry and the information and communication industry are typical. Their annual working hours are long, more than 60 hours of work per week compared to other industries.

For example, the government report indicates the information technology industry's annual working hours is 1,955 hours although the total average of all industries is 1,732 hours (Ministry of Health, Labour, and Welfare, Japan, 2015).

The Ministry of Health, Labour, and Welfare attributes the following three main factors to long working hours in the information technology industry.

1. They contract projects in complex ways. Therefore, progress management is challenging. Moreover, the delivery time is short.

2. It is difficult to shorten the time in the work form, such as customer-site resident system engineers.

3. Due to the multiple subcontracting structures, there is no flexibility for deadline change.

In addition to the government, Keidanren, Japan Business Federation, also called for actions to cope with long working time (Keidanren, 2017).

In this situation, the information technology industry is a target of a specific policy to tackle "long working hours in cooperation with industry organizations in Heisei 28." It means that the national government requires the information technology industry to take a drastic measure to reduce long working hours, and it is an essential management issue for the information technology industry.

However, the information technology industry's efforts include only short-sighted and monocular measures such as the "One Hour Meeting Rule" and strengthening management items such as "Going back home all together at regular end time" and "management by the daily report system." They are not essential and effective measures to reduce the labor load or improve the quality of labor. These measures may not necessarily address the root cause of excessively long working hours in the IT industry.

Of course, overtime working is the result of an imbalance between capacity and demand. It needs thorough improvement. Otherwise, quality erosion and demand decrease suffer companies and industry (see Oliva and Sterman, 2001).

The previous study (Okada et al., 2019) explores the structure to generate overtime work, builds a system dynamics model to reflect the situation, and shows the effectiveness of each measure of prospective interventions. This previous study

shows the result that there is a no longer effective measure to decrease working hours without structural changes. The structural changes include more effective utilization of subcontractors and change of organizational culture, in particular, the tendency to produce a new software without effective reuse of existing modules ("full-scratch" coding).It naturally needs the drastic changes stimulated by the digital transformation (see Weill and Woerner, 2018).

This study explores another measure to cope with the long overtime work. Japan's national government encourages to extend upper retirement age. Recruiting age is the same as before. Most people in Japan find a job in the final year of school. Therefore, the government requests industries to raise the retirement age. This intervention leads to labor population increase. The government expects that to pour more labor resolve "backlog" in industries; therefore, it resolves the long working time problem.

The labor side also supports this policy. Japan's basic pension system needs some reform (Inagaki, 2010). The basic pension is not sufficient to keep living standards of current working people after retirement. People, therefore, need additional money and to save it for their retirement.

In this situation, there is universal agreement to extend upper retirement age. This paper examines the effect of this upper retirement age extension.

2. THE STRUCTURE OF THE MODEL

Our model has a sample of an existing information technology company. In Japan, this company is one of the largest companies. It has four categories of software engineers: G2, G3, G4, and SP. G1 existed in the past; however, the company abolished it now.

Most new employees are in the G2 category. They get promoted to G3, G4, and finally SP depending on their skills. The model contains the number of each category expressed as a connected stock variable sequence. The model standardizes each productivity of each category based on a person in G2. Each category has an outflow, which consists of retirement by the contracted age and quitting by one's own will.

The ratio of total production capacity and total backlog makes the necessary working time. This necessary working time is the source of overtime working hours. However, Japan's government requires industries to decrease overtime work. Therefore, many companies are starting to extend upper retirement age, that is, to raise the retirement age. This study shows the effect of extending the upper retirement age.

The abstract structure appears in figure 1. This structure shows only the main structure. As a simulation model, the actual model has many other variables and links. The model has an "aging chain" structure which appears in human resource models (for example, see Größler and Zock, 2010).

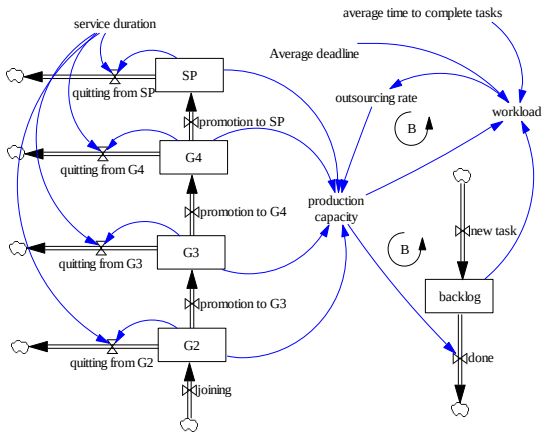

Figure 1. Abstract stock flow structure.

In addition to figure 1, there would be influences from upper retirement age to the structure in figure 2.

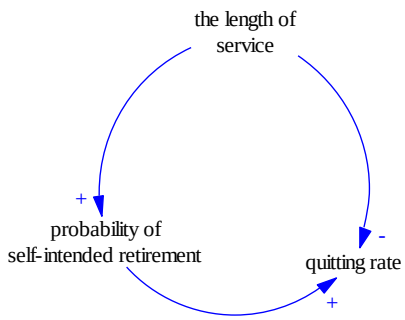

Figure 2. The effect of extending upper retirement age (abstract causality)

3. SIMULATION RESULTS

This study sets the four scenarios. "Base scenario" reflects the sample company's real parameters. The model has parameters based on the sample company's real data from 2012 to 2015. This study uses the result of this term for model validation. It corresponds well to the sample company's historical data. After 2016, these parameters keep values in 2015 in the model.

A pure reflection of the intervention to extend upper retirement age that is to raise the retirement age is "Raising retirement age" scenario. The sample company has a rule that all employees retire 60 years old birthday. Some developed countries ban this type of age limitation. However, it is common and permitted in Japan. The intervention is to change this age to 65, five years longer than the reality. If this service time extension has no side effect, it decreases overtime work.

Figure 3 shows the comparison between the "base scenario" and "raising retirement age" scenario. "Raising retirement age" scenario is less overtime working time than the "base scenario." However, the effect is small compared to the structural changes in the Okada et al. (2019).

However, longer employment duration must have side effects. One of the apparent side effects is the increase in the quitting rate. Compared to younger engineers, older engineers tend to have a health problem and a high possibility to care for their own family. In particular, engineers in the sample company always has a large backlog. It puts pressures on engineers. As Volkoff et al. (2010) show, older employees, over fifty years old, tend to have more health problems than younger engineers when receiving exposure to high pressure.

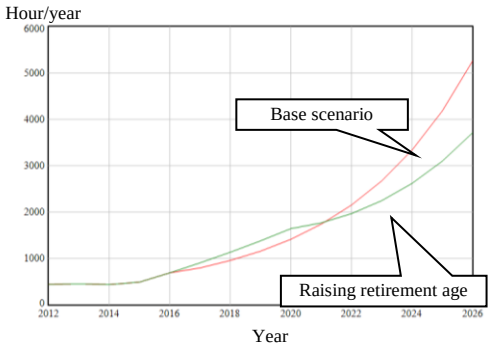

Figure 3. Comparison "overtime" between base and "raising retirement age" scenario.

In order to examine the effect of this quitting rate increase, this paper adds two more scenarios. Older engineers concentrate in the upper rank of engineers, namely SP and G4. SP is the highest rank in this company. It means that the average age of SP is higher than one of G4.Current quitting rate excluding the reason for the age limit is 2.2% for both SP and G4. For example, one experiment is to increase SP rank engineers' quitting rate to 3.2%, one point up. This experiment is "SP engineers' quitting rate up" scenario. This scenario, of course, also implements the "longer employment duration" condition, the same as "raising retirement age" scenario.

The other additional scenario sets 3.2% quitting rate for both SP and G4 rank engineers. This scenario is "SP and G4 engineers' quitting rate up."

Figure 4 shows transitions of annual total overwork time of four scenarios.

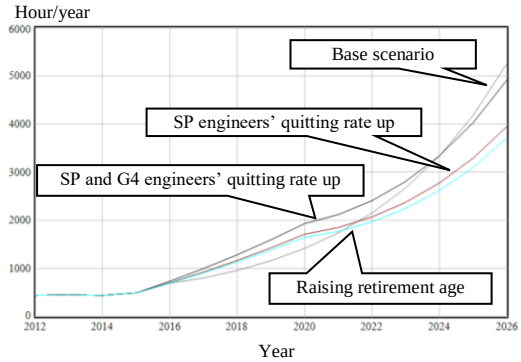

Figure 4. Comparison among four scenarios

The scenario "SP engineers' quitting rate up" shows limited effect on "raising retirement age" scenario conditions. Higher quitting rate contradicts decrease of overtime work by introducing the employment duration extension.

However, the "SP and G4 engineers' quitting rate up" scenario shows a significant effect. Only one-point increase of quitting rate spoils the effect of the extended upper retirement age policy. At the end of the simulation, 2026, the overtime work of "SP and G4 engineers' quitting rate up" scenario is more than "base scenario."

The difference in the impact of the additional two scenarios results from the initial value of numbers of engineers. G4 rank engineers are five times of SP rank engineers in 2012 (figure 5).

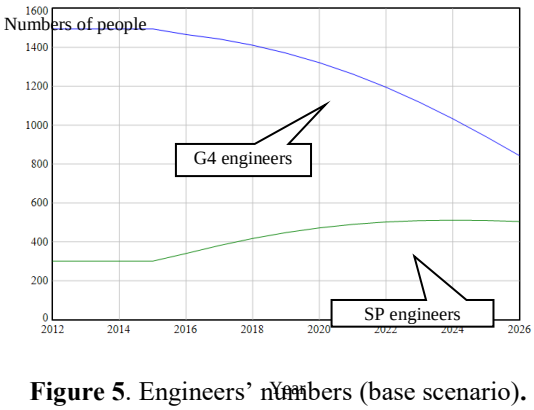

Figure 5. Engineers' numbers (base scenario)**.**

These numbers of people are gradually approaching overtime. SP rank engineer's average productivity is 15% higher than G4. However, the volume effect of G4 engineers denies SP's higher productivity.

These additional scenario's experiment, change of quitting rate from 2.2% to 3.2%, is small change. If introducing the upper retirement age extension policy, the quitting rate change can be much more than 3.2%. It worsens the working hour condition.

The simulation results suggest that the upper retirement age extension has a significant side effect. This model implements the change in turnover rate exogenously. Therefore, this study leaves the inclusion of the average age as an endogenous variable in future.

4. SHORT REMARKS

This study explores the effects and side effects of the policy to introduce longer employment duration of engineers to cope with the overtime working hour problems. The simulation model is built based on the existing information technology company. This policy is easy to understand for everyone; therefore, business and government would adopt and start it without thorough examinations.

However, this intervention does not contribute to improving the situation. Simulation results show side effects which cause to eliminate the positive expected effect of the policy.

Government and industries need to intervene in bringing about structural changes for overtime work. It includes the industry structure change and each company's adoption of digital transformation.

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