Corporate Foresight in Japan

Tatsuro Yoda (Institute for Future Engineering)

1. Introduction

Foresight, or systematic attempts to look at future trends of science, technology, economy or society, has been mainly conducted in the government sector, and been utilized for the government policy-making. Recently foresight activities in firms, or "corporate foresight," have increased both in quantity and quality in many countries. They have gained importance when uncertainties for firms are increasing in the global economy and firms face rapid technological change. However, academic analysis of foresight activities has been conducted mainly on government foresights, and not much attention has been paid to foresight conducted by private firms, at least in Japan.

It is pointed out that it is important for Japanese firms to have a mid-to-long-term strategic vision. But strategic vision produced without rigorous analytic efforts on future trends would be misleading. In order to make an effective corporate vision or strategy, it would be necessary to analyze and understand future trends, for example, by conducting corporate foresight.

In this study, we examine the practices of corporate foresight based on literature survey. Then, based on the results of the survey conducted for major Japanese firms in 2012, we examine the change in conduct of corporate foresight during the past 10 years, and compare the characteristics of corporate foresight conducted mainly in Europe with those in Japan.

2. Methodology

The method of this study is literature survey and questionnaire survey for firms in Japan. First, we review the literature on foresight activities conducted at firms, in order to examine its definition, purposes, methods used, impacts challenges for implementation, and so forth.

Second, we conduct a questionnaire survey with major firms in Japan. The questionnaire is produced based on the findings of literature survey and includes the questions on characteristics of the firm, practices of corporate foresight, and use of government foresight for producing corporate foresight. Questionnaire includes the same kinds of questions as are used in the survey conducted in Europe or the U.S. in order to compare the results.

The questionnaires were sent in March 2012 to 401 major firms in Japan, which are listed in the First section market of the Tokyo Stock Exchange, whose revenues are over 140 billion Japanese yen, and R&D expenditures are at least 10 million yen in FY2010 according to the data in *Quarterly Corporate Report*. [1] The answers to the questionnaire were sent back within one month by mail, or online (web survey).

3. Corporate foresight

Based on literature survey on corporate foresight, we examine corporate foresight's definition, purposes, methodology, data sources, organization for implementation, challenges, output, effects or impacts.

Becker (2002) defines "foresight" in general as follows: "a participatory, future intelligence gathering and medium-to-long-term vision-building process that systematically attempts to look

[1] The 2011 earthquake off the Pacific coast of Tōhoku took place one year before this survey (March 11). I delayed the period for this survey as late as possible in order to minimize the effect of the earthquake on the survey results. The effect of this event on the perceived value of corporate foresight would be in both ways. On the one hand, the earthquake may increase the sense of uncertainty and the value of insight into the future obtained through foresight may have increased. On the other hand, the earthquake may pressure firms to focus on the shorter-term results, which may have decreased the value of foresight.

into the future of science, the economy and society in order to support present-day decision-making and to mobilize joint forces to realize them." "Corporate foresight" is defined as foresight conducted by a firm or firms.
There are various kinds of purposes of conducting corporate foresight for a firm: strengthening competitiveness, utilization of knowledge internal to the firm, identification of useful knowledge, discovery of new trends, development of new business, or understanding of discontinuous technological change (Reger 2001). Or, corporate foresight provides anticipatory intelligence, setting of a new direction, priority setting, strategy making, and a catalyst for innovation (Becker 2002).
Various methods are used for corporate foresight including patent analysis, content analysis of research articles, market analysis, customer survey, technology mapping, scenario writing, or Delphi survey. The method used depends on the purpose of foresight activity at each firm. When conducting corporate foresight, some firms collect and analyze qualitative or quantitative data by themselves, while other firms use mainly the result of foresight conducted by government such as Delphi survey or technology mapping.
Theoretical or conceptual research on foresight or future forecasting for firms has been conducted since the 1960s and 1970s. For example, using the concept "weak signal," Ansoff (1975) argued that it would be possible to perceive change in advance and conscious efforts to collect and analyze information would be necessary in the 1970s. In the 1980s, the practices of corporate foresight began spreading widely. UNIDO manual on technology foresight explains that "[i]n the last two decades several large enterprises in such diverse sectors as energy, automotive, telecommunications and information technology have established foresight groups and strategic planning processes, which analyze the long-term prospects of new technologies and their impact on markets and corporate strategies." (UNIDO 2005, p.226)
In the survey in 2002, all of the 18 major firms in Europe, which have competitive positions in market and with large R&D budget, conduct foresight, and analyze technology or market trend (Becker 2002). According to the survey, the reasons why those firms conduct corporate foresight were that 1) knowledge on long-term business trend becomes more important, and 2) proactive activities become important in order to cope with uncertainty in business environment.

4. Survey on corporate foresight in Japan

There have been many interviews and surveys conducted in Europe since the early 2000s that examined the situation on corporate foresight in European firms (Becker 2000; Reger 2001; Daheim and Uerz 2008). On the other hand, there has not been any such survey conducted in Japan since the year 2000 (NISTEP 2000)[2]. For the survey in this study, 54 firms responded (response rate: 13.5 percent). For the firms that responded, the average annual revenue is 1,495 billion yen, and the average annual R&D expenditure is 53 billion yen, while for the firms that did not respond, the average annual revenue is 834 billion yen, and the average annual R&D expenditure is 25 billion yen. For the firms with more than 3 trillion yen and more than 1.5 trillion yen of annual revenue, the response rate was 36 percent (9 firms out of 25) and 23 percent (13 firms out of 56) respectively. For the firms with more than 100 billion yen and 50 billion yen of annual R&D expenditure, the response rate was 25 percent (7 firms out of 28) and 21 percent (10 firms out of 47) respectively. Looking at those data we could say that the responses include larger firms in the sampling frame.
Most of those firms belong to manufacturing sector with high R&D intensity. In the manufacturing sector, the proportion of firms in electronics equipment sector (13 firms) and automobile sector (8 firms) were large. The response rates in major industrial sectors are as follows: electrical equipment sector (24 percent, 13 firms out of 54 (abbreviated as 13/54 hereafter)), construction sector (12 percent, 5/41), chemical sector (12 percent, 5/41), transportation equipment sector (22 percent, 8/37), food and grocery sector (3 percent, 1/32), wholesale sector (9 percent, 2/23), information, telecommunications and broadcasting (5 percent, 1/19), electric and gas (21 percent, 3/14) and non-ferrous metal sector (14 percent, 2/14). Firms in service sectors or in manufacturing sectors with low R&D intensity such as food are not included much in the responses.

[2] An early attempt includes Irvine and Martin (1984), which looked at the forecasting activities on strategic and applied research at industry and firms by conducing interviews.

The following is the brief explanation of the results.

a. Do firms practice corporate foresight?

Sixty five percent of firms conduct foresight and 10 percent of firms do not conduct it now but practiced before. Therefore, three fourths of the firms have experiences in doing foresight. Thirty four percent of firms conduct foresight once a year and 38 percent of firms conduct it but not periodically. In order to look at the effect of the size of revenue, R&D expenditure, and R&D intensity (R&D expenditure divided by revenue), we conduct logistic regression using conduct of foresight as dichotomous dependent variable, and those three variables as independent variables. Only R&D intensity is statistically significant.[3] Odd ratio is 1.33, meaning that 1 unit (1 percent) increase of R&D intensity increases the odds[4] of conducting foresight by 33 percent. Since the responses are returned by larger firms, it would be difficult to conclude that the size of revenue or R&D expenditure have no effect on the probability of conducting foresight. What we could say from this analysis would be that among larger firms the size of R&D intensity has an effect but the size of revenue or R&D expenditure does not have an effect.

b. What are the motivations for corporate foresight?

Sixty five percent of respondents perceive that the corporate foresight is very important, and sixty percent perceive that the importance has been increasing. Among the firms that implement corporate foresight, the motivation for it included "the necessary for commercializing technology or making new service" (69 percent), "long product development cycle and the necessity of large scale investment" (59 percent), and "making a company's business strategy" (59 percent). On the other hand, among the firms that do not conduct corporate foresight, or firms that had conducted foresight once but do not conduct it now, the reason why they do not conduct foresight included "shortage of skills inside the firm for conducting foresight" (50 percent), "fast cycle of technology development or product development" (44 percent), and "relative easiness of access to necessary information at trade fairs or academic conferences" (44 percent).

c. What do firms use the result of corporate foresight for?

As to the time span of foresight, mid-term (5 to 10 years) and short-term (less than 5 years) were selected by about half of companies and about 30 percent of respondents respectively. As Figure 1 shows, firms use the results of foresight for making R&D strategy, business strategy, company vision or R&D projects. About 70 percent of firms that select R&D strategy, company vision, and R&D projects think that corporate foresight is effective for producing those.

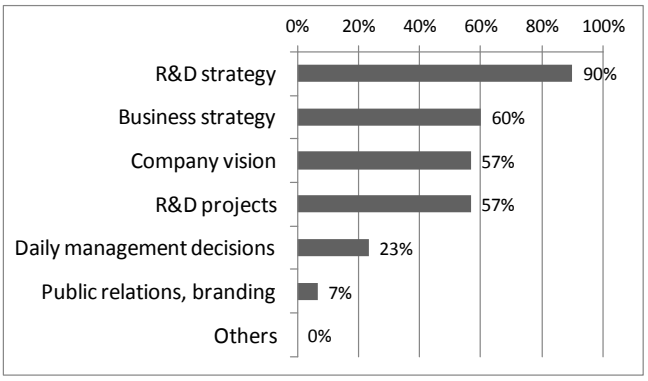

Figure 1: Use of results of corporate foresight (firms that conduct foresight (n=30))

5. Discussion

We compare the results of this survey with those of the survey on foresight conducted in 2000 in Japan (NISTEP 2000) and surveys conducted in Europe since the early 2000s.

a. Difference with results of the survey conducted in Japan in 2000

What kind of changes can be observed in Japanese firm's thinking on foresight between 2000 and 2012? In other words, considering what had happened during the past 12 years, do Japanese firms think more of foresight since it becomes more important to nurture strengths thinking in the longer-term when newly developed nations are catching up? Or, on the contrary, do Japanese firms think less of foresight since they think in the shorter-term? Since sampling methods of those two surveys are different, we should be careful when comparing the results of those surveys. That being said, we could observe the following differences. First, about 20 percent of firms responded that they conduct technology foresight by themselves in 2000, while about 65 percent of firms responded so in this survey. Second, in this survey, the proportion of using the technology roadmap produced

[3] For the model using R&D intensity, p-value of the model is 0.025, and z-value of the coefficient is 0.076.

[4] Odds is defined as p/(1-p).

by the Ministry of Economy, Trade and Industry (METI), which was not produced in 2000, increased rapidly (90 percent of firms). The technology foresight based on Delphi survey produced by the NISTEP of the Ministry of Education, Culture, Sports, Science and Technology (MEXT) was used by 54 percent of the firms in this survey. Third, the proportion of using roadmapping and technology portfolio method as methodologies for foresight increased.

b. Comparison with the survey conducted in Europe

Some points out that Japanese firms are relatively weak in open innovation and producing good business strategy. Do Japanese firms use foresight as a tool for increasing open innovation and revising the assumptions on business strategy? Basic differences are as follows:

First, "out-sourcer type" foresight as a new type of organization for conducting foresight was pointed out in the literature (Daheim and Uerz 2008), but about 80 to 90 percent of respondents selected the answer "conduct foresight, mainly by internal staff and with ad-hoc organization." Less than 10 percent selected "conduct foresight periodically with the use of expertise or organization outside of the firm." Second, the literature pointed out that the major problem of conducting foresight is that foresight is not integrated in the decision making process of the firm (Reger 2001). But according to the result of the survey in Japan, more than 70 percent of respondents reported the results of foresight in the top level board meeting and more than 90 percent of respondents use the result of foresight in the making of R&D strategy. On the other, there are many problems for conducting foresight in the responses of the firms that have not conducted foresight before, such as shortage of skills. Third, the literature pointed out poor communication inside a firm is one of the problems for conducting foresight (Becker 2002). But in the current survey, communication, inside a firm, is not perceived as much of a problem, while participatory or dialogue type method for conducting foresight, especially with outside participants, is not used widely in Japanese firms. Fourth, corporate foresight is not only for firms in R&D intensive manufacturing sectors. It would provide valuable knowledge also for firms in sectors with large and long-term investment or in sectors with low R&D intensity facing high market uncertainty. In Japan, the recognition of importance of corporate foresight has increased recently. But its practice is not widespread outside of manufacturing sectors with high R&D intensity, as is seen in the results of the survey. In addition, it would be possible to interpret low response rate of firms outside of those sectors as an indicator of low interest or low rate of adoption of corporate foresight as a management tool.

6. Conclusion

In sum, the survey shows that the large proportion of big Japanese firms conduct foresight activities and the foresight is well used in the business or R&D strategy making process of firms. However, participatory or dialogue type foresight, and the use of information outside of the firm is weak. In addition, corporate foresight is practiced mainly in technology-oriented manufacturing sectors with high R&D intensity. There would be potential for other industrial sectors including service sectors to conduct corporate foresight in order to gain understanding of the future uncertain environment proactively and bring about more innovation.

Reference

Ansoff, H. Igor. 1975. Managing strategic surprise by response to weak signals. *California Management Review*. Vol.18, Issue 2, pp.21-34.

Becker, Patrick. *Corporate Foresight in Europe: A First Overview*. European Commission. October 2002.

Daheim, Cornelia and Gereon Uerz. 2008. Corporate foresight in Europe: from trend based on logics to open foresight. *Technology Analysis and Strategic Management*. Vol.20, No.3, 321-336.

Irvine, John and B.R. Martin, 1984, *Foresight in Science: Picking the Winners.* London: Pinter Publishers.

National Institute of Science and Technology Policy (NISTEP). 2000. Use of Technology Foresight and Request for the next Technology Foresight: Results of Survey and Interviews on Readers and Users of the 6th Technology Foresight. Report series 69. In Japanese.

Reger, Guido. 2001. Technology foresight in companies: from an indicator to a network and process perspective. *Technology Analysis and Strategic Management*. Vol. 13, No.4. pp.533-553.

UNIDO. 2005. *Technology Foresight Manual*, Vienna.