Session 2	Corporate Governance in the Human Capital Era : The Need to Nurture "Long-term Investors" - Pursuing real corporate value sharing the same "timeline" as management	
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As the accumulation of highly intelligent and knowledgeable human capital becomes increasingly important to companies, it is now becoming critical to revisit the framework of business corporations and capital markets to better align them with socioeconomic development. Having both managers and investors think on the same "timeline" is the key to effective corporate governance, and there is an urgent need to nurture those investors who patiently conduce to higher corporate earnings.

### Knowledge-intensive industries to be the mainstream in the 21st century

In the 20th century, it was the accumulation of the real capital — money — that controlled the fate of competition between companies. In capital-intensive industries, the principal industries of the era, there was massive demand for funds, and that environment brought about the development of corporate governance characterized by shareholder sovereignty, notably in the United States.

In contrast, the 21st century is the age of knowledge-intensive industries in which intellectual capital and human capital hold the key. In this case what becomes vital is not the size and degree of concentration of plant and equipment, but the quantity and quality of the knowledge of the people who work in a company and their skills at coordinating themselves in an organic manner. This leads to a common global theme of how better the monetary-based systems such as business corporations and capital markets can be aligned with socioeconomic development.

The typical management model at Japanese companies is one in which knowledge is not concentrated in a selected group of the corporate elite, but is maximized collectively and organically by the ordinary employees as a whole. This means the Japanese companies are the most advanced in the world when it comes to progressing along the roads to becoming totally knowledge-intensive, and the Japanese capital market is already facing this substantive issue at the world's frontier.

The author believes that a clear break should be made from the dogma now current in Japan of considering a company to be the property of its shareholders, which reduces the mission of corporate managers to that of maximizing shareholder value, namely the share price.

All shareholders do is to hold "shares," which represents the most junior claim to residual distributions relat-

ing to a company's profits and assets. What makes a "corporation" one of the history's greatest inventions is that it created a juridical person separate from natural persons, i.e., a fictitious right-holding entity with limited liability, that facilitated more risky and larger-scale corporate activity in terms of time and space. This bears no relationship to the dogma of shareholders' being the owners of companies.

The logic that the maximization of share price, which should reflect shareholder value efficiently, is the mission of corporate management because the interests of a company as a whole and those of its shareholders are identical ("share-price dogma") is also based on very weak grounds. In the real world, a variety of means can be employed to increase shareholder value while exposing the company concerned to excessive risks or damaging the corporate value: for example, a company can raise financial leverage at the risk of increasing the probability of bankruptcy while damaging the corporate value; or the management of a company in a quasi-bankruptcy situation can pay out dividends to shareholders ignoring the risk of impending bankruptcy. There are no such things as perfectly efficient securities markets anywhere in the world, and it is not possible to claim that true corporate value is always reflected accurately in share price. The fact that corporate laws in many countries grant shareholders the primary sovereignty is simply a policy option for corporate governance mechanisms.

In the 21st century, the fundamental mission of a corporation remains that of increasing fundamental corporate value (i.e., sustainable business earnings). The overarching task for corporate managers, which also is the common goal of all stakeholders, is that of producing goods and services that no other company can match, thus ensuring the sustainability of enhancing the profitability of its core businesses.

#### No decisive solutions other than the discipline of capital

Two fundamental principles of the theory of governance are: (1) to integrate and coordinate the interests of diverse stakeholders; and (2) to incorporate a control mechanism based on rules and discipline to prevent, control, and eliminate corruption of an organization and abuses in management. According to Sir Winston Churchill, "It has been said that democracy is the worst form of government except all the others that have been tried"; similarly, with respect to corporate governance, it is very difficult to find a system that is an effective alternative to governance based on the discipline of capital, or what could be termed the "democracy of capital."

History provides a number of examples of how organizations in which governance by external discipline does not work have become corrupt and succumb readily to inefficiency. Corporate organizations and political systems created by the Japanese are no exception, and the same applies to corporate management in a knowledge-intensive age.

The most appropriate entities to take responsibility for external control are the entities that provide a company's money, which act according to clear principles in the form of their economic interests. The problem here is that today, shareholders and equity markets are no longer able to act as principals in line with the two fundamental principles mentioned above.



In a knowledge-intensive age, organic joint operations by groups of natural persons constitute the driving force behind the generation of corporate earnings. On the other hand, in the capital markets there is an increase in the number of shareholders whose objective is short-term trading, such as speculative funds and day traders. In consequence, there will be a more serious gap between investors of that type and in-house personnel whose turnover speed is markedly slower.

Several years ago there was an incident in which a U.S. rating agency lowered its rating for Toyota Motor Corporation because of that company's system of lifetime employment, against which Toyota argued that it was in fact this long-term stable employment that enhanced its corporate value. Here the substantive issue is not the propriety of long-term employment, but whether there is a gap between, on one hand, the timeline and the assumed period of participation on the part of the business (product market) and managers and employees (labor market) and, on the other hand, those of the capital market that assumes responsibility for governance.

Even though managers and employees have no real sense of generating corporate earnings through the money shareholders invest, or that does not in fact occur, shareholders unconcerned about a sustained increase in corporate value over the medium- to long-term have the power to call for a company's cash in hand to be run down and for dividends to be raised, and finally to determine the fate of the company, for example through mergers or acquisitions. In a sense it is inevitable in the present era for managers and employees to share a sense of indignation and a feeling of the absurdity of this.

If this is not overcome, corporate governance based on the discipline of capital will function only partially. It is essential to determine how to create a mechanism in which knowledgeable personnel who conduct company business in-house and generate values, and external investors who take charge of discipline from the outside, aim for the common goal of ensuring the real and sustained enhancement of corporate value.

### Japan has surplus funds and surplus capacity for human-resource development

To achieve this, it is of course essential to persist with efforts to create efficient capital markets, and it is important for true corporate value to be reflected accurately in shareholder value. In addition, with regard to the shareholders' responsibilities and management's fiduciary duty of loyalty, it is essential to recognize anew that when they enhance shareholder value there is also the countervailing risk that corporate value will be damaged. The ultimate responsibility and fiduciary duty of loyalty of managers (and shareholders with controlling rights) should be set out explicitly in the corporate law with respect to the maintenance and augmentation of overall corporate value.

Upon making the aforementioned best efforts, a more substantial problem that remains is that of the discord between the timelines of financial capital (money) and that of human capital (people). One possible method to resolve this would be to restrict involvement in corporate governance by shareholders who hold their shares for short periods only. Other conceivable methods include: limiting the exercise of voting rights by linking them with the periods for which shares are held; an approach such as that of Google in the U.S., which distributes only class shares with no or limited voting rights; or taking companies private. However, with respect to practical problems, numerous technical obstacles can be envisaged, and there is also a risk that corporate governance will be wiped out completely. It cannot be denied that the above-mentioned methods are still limited in the ability to resolve issues.

Other inherent dangers are that systems of remuneration linked with shareholder value have proved problematic, even in the United States, and there is a danger that managers go in pursuit of short-term profit and damage real corporate value. In addition, groups of natural persons have diverse values that cannot be measured in terms of monetary value, and in fact these generally constitute the source of the power of a strong corporate organization. As is the case with many Japanese companies, management of collective knowledge-intensive human capital requires understanding of the limitations and the risks of this mechanism.

The author therefore believes that the most fundamental solution may be to work patiently to build up the number of investors who, irrespective of risk, monitor patiently the sustained, long-term increase in company earnings, and then to demonstrate how their investment and governance function effectively over the medium- to long-term through the increase in corporate value and hence investment yield is maximized. In this scenario, the people who take responsibility for putting corporate governance into practice are investors who provide the company with funds premised on long-term involvement and who can talk about the true corporate value; in other words, they are the people who have the ability and the will to engage in substantive discussions concerning management and business with company managers and other knowledgeable in-house personnel, on the same level and using the same language. Through this, human capital and financial capital will at last be brought into line in terms of both time and understanding, and governance capabilities will be revived.

A model in which investors have a capability of discussing management in this way has not yet been developed anywhere in the world, but Japan is a fund-surplus country with the capacity to provide long-term risk money, and for that reason has the potential to lead the world in creating a dense base of human resources. The key for enabling Japanese companies to achieve further sustained development in the 21st century can be provided by the rebuilding – through investment based on governance characterized by long-term commitment – of corporate governance mechanisms in today's knowledge-intensive age, primarily by equity investors in the case of public companies, and by banks that have built close and solid relationships with their customers and by private equity investors in the case of SMEs and middle-market companies that have not gone public. This is also a major national issue for a country with a declining birthrate and aging society.

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Session 2

# Science and Sensibility: When Pasteur's Quadrant Meets the Real World of Innovation

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This paper presents some observations about innovation as it relates to the nature of research and technology, with some attendant policy implications. My aim is to illustrate that the application of familiar typologies to classifying types of R&D can be complicated by the complexity of innovation in real world environments, and the constraints of implementation. These observations are based on my research findings from Singapore as well as the broader academic literature on innovation.

I will begin by reviewing the use of Stoke's typology, which has influenced current US science policy thinking perhaps to a greater extent than most. In some ways, the heavy state-led funding of biotech and health-related fields in Asia is also driven by a similar philosophy, but it is one, I will argue, that has connections to different commercial realities than Stokes might have imagined. Hence, the straightforward application of Stoke's or Stoke's-like typologies to forming policy needs to be more carefully examined.

It is useful to begin by recalling that Stokes (1997) sought to displace Vannevar Bush's 1950s notions that, firstly, curiosity-driven basic research was paramount in a national R&D scheme, and secondly, that innovation necessarily had to come from following a linear path (in which basic research results flow through succeeding stages in a process of increasing productization). In addressing the first notion, Stokes noted that while much of the research work conducted in the past had been curiosity-driven basic research (Bohr's quadrant) and use-driven applied research (Edison's quadrant), increasingly, use-inspired scientific research (Pasteur's Quadrant) could have a greater impact on economic development.

However, I would argue that the notion of "use-driven" may be too general to be of help, be it in applied or basic research, when we consider how innovations actually occur nowadays, or various other notions of innovation. Used too liberally, it may even drive out other forms of innovation. While most of my observations relate to applied (technological) research, some of the same points might be partly applicable to basic (or pure science) research. My concerns stem from four observations of how innovation takes place, or how research and innovation are related:

## 1. Problems from assuming that application is rational and straightforward: the crooked path (and adaptive business behavior) to "serendipitous" outcomes?

The actual application (of a technology) is not always determined beforehand, and serendipity may play a role in the final application of a technology. Classics examples are 3M's Post-it pad; and Edison's belief in his phonograph's most likely uses — all of which were wrong.