

Designing Pension Systems for a Knowledge Economy

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When an ideal approach to pension systems is considered, it is essential that the analyses include pension funding and the divergent effects of pension systems on the real economy. As the importance of intangibles (intangible property) is increasing in the real economy, significant developments are occurring in the emergence of a knowledge economy. This trend is most remarkable in the United States, which possesses a strong socioeconomic environment that encompasses lifestyles, the labor market, company organizations, market infrastructure, city functions, and financial and capital markets. Japan must promote a knowledge economy and raise productivity more than the United States in the 21st century because its working population is projected to decline. Promoting a knowledge economy to raise productivity requires laying the groundwork to give Japan's socioeconomic environment greater flexibility. It is desirable to design an appropriate pension system to coexist with this development. But the disincentive effects created by the present corporate pension plans and public pension system in Japan will make some of the various aspects of the socioeconomic environment less flexible, which will consequently hinder the progress of a knowledge economy in the future. These undesirable consequences could be avoided by changing the present corporate pension plans to create other systems that allow firms and employees to flexibly choose alternatives such as defined benefits or defined contributions. It is also desirable to adjust the benefit levels of Japan's public pension system to control the increase of future liabilities and to introduce individual pension accounts as early as possible. At the same time, organized reforms must take place in the financial and capital markets closely linked to the effectiveness of the pension system to (1) improve the investment skills of institutional investors, (2) develop diversified products, (3) enhance investor education, and (4) provide new risk management services that match an individual's life cycle.

I The Diverse Effects of Pension Systems on the Real Economy

Individuals make countless sundry choices both large and small as they survey the future. Taken together, these options weave the fabric of each person's life. This does not mean, however, that we can design our own lives freely, for various conditions restrict and influence our decisions.

The typical restriction is set by the amount of income, assets and other resources we can use, and we must make decisions appropriately with only a vague understanding of the future. Particularly today, we must frequently forecast what might happen in the future when we make a decision. This task is never easy, for it involves a great many uncertainties.

In recent years the influence of public policies and systems on each individual's choices and actions has grown stronger. One example is the tax system. Taxes such as income, consumption and inheritance taxes frequently influence an individual's life plan. Furthermore, as people live longer today, both corporate pension plans and the public pension system have acquired an inordinately large influence. Because managers cannot run companies without taking into account the impact of their pension plans, many people have become interested in various issues concerning the Japanese pension system.

Recently in the United States, discussions regarding the pension system have been heating up partly because of the campaign proposal by President Bush to convert part of the public pension system into individual retirement accounts.

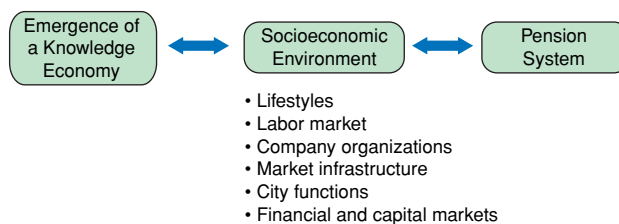
A pension system requires long-term contributions and benefit payments so that pension funding becomes a primary issue that requires constant and careful attention. Questions such as how to handle the unfunded pension liabilities in corporate pension plans and how to fund the enormous future liabilities of the public pension system have become one of the most serious problems Japan faces today.

At the same time, another urgent problem we must consider from various aspects is the nature and degree of the impact of pension systems on the real economy. Certainly we have for years been actively discussing the influence of pension systems on decisions to change jobs, the time of retirement, individual savings trends, and capital formation.

In addition, pension systems have various important effects from the broader perspective of a socioeconomic environment including lifestyles, the labor market, company organizations, market infrastructure, city functions, and financial and capital markets. In the past, however, many of these issues have not been seriously discussed.

The focus of this paper is (1) to broadly identify the relationship between pension systems and the real

Figure 1. Framework for Discussion in this Paper



economy, (2) to evaluate their impact, and (3) to recommend future reforms. Our basic viewpoint is that while pension systems have extremely important policy objectives of their own, we must simultaneously design pensions that are compatible with the policy objective of increasing the potential growth of the real economy.

Specifically, Section II will focus on the emergence of a knowledge economy as one of the major trends of today. This trend assumes that firms and individuals will aggressively exploit new technology and knowledge to increase their potential to grow. Based on the example of the United States, we will consider how a knowledge economy mutually interacts with the socioeconomic environment within the economic infrastructure.

Section III will examine the various disincentives exerted by Japanese pension systems on individuals and companies, as well as their broader effects on the socioeconomic environment.

Section IV will discuss how the pension system should be changed to enable the socioeconomic environment in Japan to evolve smoothly into a knowledge economy. We also will discuss the future of financial and capital markets, which are closely related to pension systems. The framework for this discussion is shown in Figure 1.

II The Emergence and Socioeconomic Environment of a Knowledge Economy

1 The Importance of Intangibles

In today's economy we tend to organize firms and markets with the help of new technology and new knowledge. IT and financial innovations in recent years have further strengthened this tendency. Most recently biotechnology has begun to exert a strong influence. In this paper we refer to this trend as the emergence of a knowledge economy.

Moreover, in the industrial world recently, various cooperative or competitive actions between firms have attracted worldwide attention. To cite several examples, consider the merger of AOL (America Online) and Time Warner Inc., Chase Manhattan Bank's purchase of JP Morgan Inc., or the competition among international research consortia and venture firms to decipher the human genome. We can glean the characteristics of today's

era in this collaboration or competition among organizations that possess cutting-edge technology or knowledge.

The knowledge economy began to appear as a clearly prominent phenomenon in the 1990s. The United States was at the center of its emergence, and it spread worldwide. Even in Japan, which suffered through the so-called “Lost Decade” of recession and low growth, companies have successively introduced new technologies and knowledge into the economy.

In examining the balance sheets of firms, we recognize that intangibles (intangible assets), such as intellectual property, organizational capital and human capital have become more important, as shown in Figure 2.¹

This point has attracted attention even in academic debates. In his keynote address to the annual meeting of the American Economic Association in January of this year, for example, Professor Robert E. Hall of Stanford University noted that trying to explain the high stock prices in the US by examining the ratio of hard assets (fixed assets) to GDP over the long term revealed a steady decline, while the ratio of firm value to GDP changed over time and rose greatly from the first half of 1990s. This he described as an example to suggest an increase in the role of intangibles.²

Moreover, Professor Dale W. Jorgensen of Harvard University, speaking as chairman of the American Economic Association, analyzed how IT contributed to the economic growth of the United States. His observations include the following points: (1) in recent years, as the result of rapid advances in semiconductor technology, companies achieved the production of faster, higher quality and less expensive memory chips and logic chips; (2) this became the foundation for the real prices of communication equipment and software to also drop greatly every year; (3) this sort of substantial decline of IT prices lowered the price of capital goods, which induced active capital investment by firms, thus improving productivity and promoting economic growth.³ This analysis emphasizes the contribution of intangibles to the vigorous growth that was achieved.

This review of past events gives prominent attention to innovations in fields such as IT and clarifies how innovation contributes to growth. This view also indicates that when the innovation rate slows or labor costs rise,

the speed at which IT prices tend to fall may slow and firms will decrease capital investments. This is an observation that can offer a number of suggestions in discussing recent US business conditions.

In addition, when we adopt a longer-term structural perspective and look at the fundamental elements that revitalized innovation, we find that many observers emphasize the socioeconomic environment that pushes US firms to strive for innovation.⁴ Such a position holds that we should also expect Japan and Europe to easily introduce and exploit new technology if it were merely a matter of technical aspects such as IT. But the United States overwhelms other regions because it excels in terms of the flexibility of its socioeconomic environment. We will examine this point more closely in this paper, as it provides a useful focus when we think about Japan’s future.

2 The Flexible Socioeconomic Environment in the United States

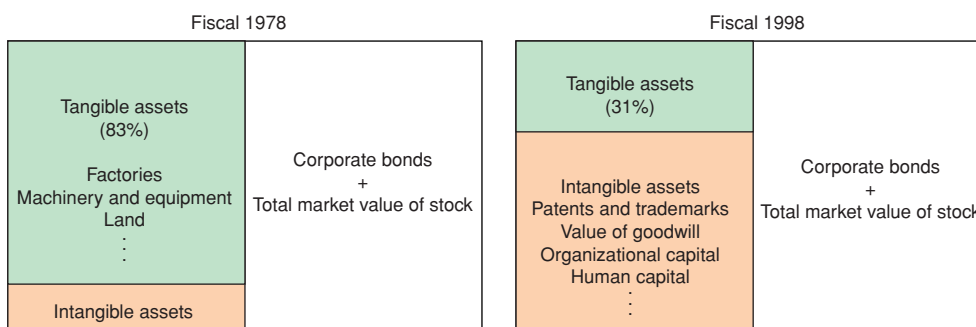
To dig deeper into this matter of infrastructure, let’s use the example of the United States to consider how a knowledge economy—which is based on new technology and knowledge—mutually interacts with the more human-centered elements of the socioeconomic environment.

[Lifestyles]

Developments in technology and knowledge have reduced the dependency of health and longevity on factors beyond our control. Indeed, individual lifestyle options, including investments in physical well-being, are now crucial in determining health and longevity. Moreover, further advances in medical technology such as gene therapy are expected to contribute even more to promoting long and healthy lives.

Consequently, people no longer regard health as a crucial factor in deciding when to retire. Moreover, after retirement people choose to enjoy a more individualized life, and their concern moves away from dependence on family or society to self-fulfillment. Supported by such changes as the spread of retirement communities where individuals can live at low cost, improved means of transportation and communication among family members, and the development of mass tourism (inexpensive

Figure 2. Changes in Balance Sheets of Listed US Corporations



Source: Compiled from data in M. M. Blair and T. A. Kochan, eds., *The New Relationship*, Brookings Institution Press, 2000.

sightseeing activities), retirement is coming to be seen as more and more attractive.⁵

[Labor market]

As society grows more complex, technology and knowledge further advance and IT investment increases, the demand for highly skilled technicians has been growing, widening the wage gap between trained and low-skill workers. This wage gap is now recognized as an opportunity, however, and is motivating women and minorities to obtain higher levels of education and training.⁶

Although changes in work and unemployment also affected white-collar workers at the beginning of the 1990s as full-scale progress towards a knowledge economy picked up steam, this segment of the labor force was able to respond promptly through flexible transfers of labor. Furthermore, as we see in the examples of Wall Street and Silicon Valley, active labor transfers facilitated the spread of technology and knowledge.

[Company organizations]

US firms that lost international competitiveness in the 1980s responded by revolutionizing their organizational structures. Companies threw off traditional hierarchies and vertical, integrated-type organizations and replaced them with horizontal organizations through restructuring and business process re-engineering. Instead of productivity improvements based chiefly on proficiency (upward shift in the learning curve) under fixed, stable organizations, IT and flexibly rearranging processes have become much more important for the creation of added value.

Some academics, especially Dean Kim B. Clark of the Harvard Business School, referred to this type of change as the rise of modularity in response to dealing with increasing complexity.⁷ That is to say, companies have separated the processes that had been intimately integrated into a specific organization and continue to transform these processes into modules that openly interface with one another.

Specifically, firms actively used M&A to simplify the separation and re-integration of processes. More recently companies have formed alliances with other firms or outside individuals or even outsourced the manufacturing divisions and research and development departments that were traditionally regarded as the core capabilities of a firm. In Silicon Valley, for example, many companies are creating high levels of firm value while consigning the manufacturing division to outside companies. Surely, this speaks realistically of the importance of intangibles.

[Market infrastructure]

In science-driven industrial sectors (i.e., fields in which science plays a leading role in new developments) such as those related to biotechnology, universities and laboratories chiefly contribute to innovation. Venture firms have jumped into the fields traditionally thought of as

being closer to basic science as well, and market competition has intensified. In addition, the role of immigrants in high-tech fields is substantial, and the number of Asian researchers and engineers in Silicon Valley is growing.

[City functions]

While cities tend to suffer from many drawbacks such as air pollution and crime, they are continually developing their functions as a spatial base for the knowledge economy.⁸ Several factors provide the background to this phenomenon. They include (1) the population density of cities that promotes exchanges among people and accelerates human capital formation, (2) the tendency of highly intelligent individuals, advanced firms and educational institutions to concentrate in cities, and (3) the function of cities to expand the advantages of specialization and the division of labor.

[Financial and capital markets]

Risk capital is now abundantly available. This includes corporate pension funds, which became a principal source of venture capital in the US in the 1970s and also took advantage of financial innovations such as securitization. As institutional investors gained strength in the 1980s, they created a market for corporate control and debated an ideal approach to corporate governance.

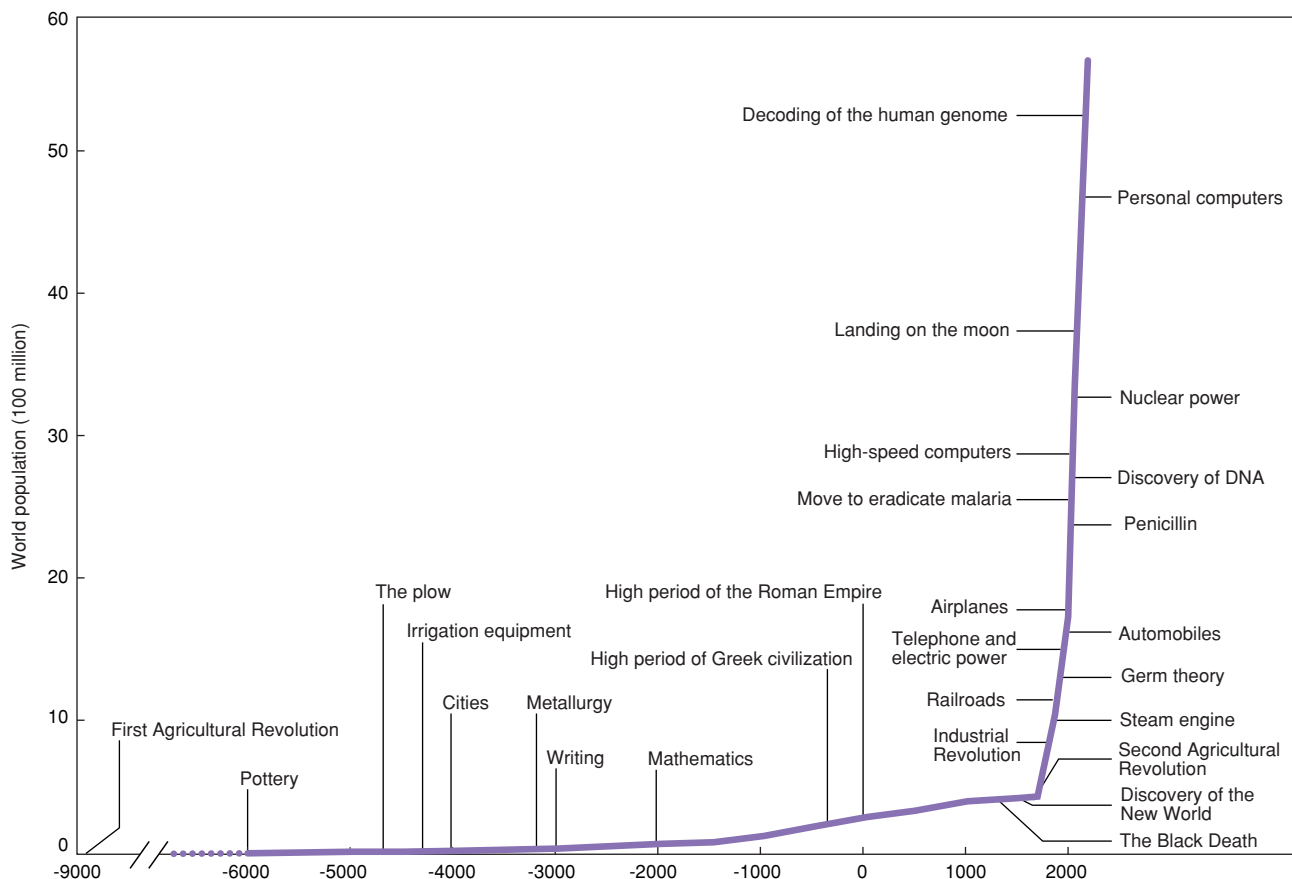
Since the 1990s, when defined contribution pension plans started to spread, individuals in the US have shifted their investments and savings from bank deposits to mutual funds, leading to what is often called the democratization and popularization of risk-taking (accepting risk for opportunities to earn higher returns). Creating capital mediation channels that bypassed banks resulted in no significant degree of confusion even if some banks became dysfunctional in the wake of their bad loan problems. Now, numerous firms continue to diversify capital mediation channels and develop competitive ideas.

As we examine the various aspects of the socioeconomic environment in the US, we can see some underlying factors that are clearly oriented towards a high-tech and knowledge-based society; namely, (1) excellent higher education and research, (2) dynamic private industry and flexible labor markets, and (3) superior management talent in many companies, including start-up firms. Moreover, the US has taken up public policies and systems such as deregulation, fiscal discipline, tax revision and financial reforms to further enhance these strengths and promote the emergence of a knowledge economy, which has facilitated risk-taking in particular and enhanced the impulse of individuals and firms to take prompt action to follow through on new ideas.

3 Current Conditions in Stagnating Japan

In contrast to this, what is the current situation in Japan? Particularly as shown by such indicators as company in-

Figure 3. Ultra-Long-Term Population Trends and Epoch-Making Technology



Source: R. W. Fogel, "Catching Up with the Economy," *American Economic Review*, March 1999.

vestment and earnings, a knowledge economy is emerging in remarkably good shape in Japan. With respect to the socioeconomic environment that should encourage innovation, however, the situation in Japan is far from adequate. Suffice it to say the projected sharp declines in the working population, the lack of entrepreneurial vitality, and the dysfunction of Japan's financial and capital markets are some examples of this weakness.

Such handicaps make people wonder whether Japan's national strength will decline in the long-term or whether the rich pool of funds created by Japan's high savings rate is being adequately used in investment opportunities.

This is a good opportunity to take a historical view by considering the epoch-making technological innovations from antiquity to the present age. The chart prepared by Professor R.W. Fogel, Nobel laureate in economic history at the University of Chicago, is ideal for this purpose (see Figure 3),⁹ as it realistically shows that technological progress took off rapidly around the time of the Industrial Revolution about 200 years ago. We can confirm from this chart that progress in IT and biotechnology innovations have been remarkable in recent years.

Such new technology and knowledge raise many difficult questions to be answered, such as the threat of cyberterrorism or ethical problems such as human cloning. Despite such challenges, however, new technology and knowledge certainly offer tremendous potential. The

emergence of a knowledge economy is, so to speak, an inevitable phenomenon that will develop in the years ahead. Basically Japan will follow the same road traveled before it by the United States.

Japan's economy of the 21st century will suffer a broad decline in working population, and Japan greatly needs to promote innovation and substantially improve productivity. For this purpose Japan must provide a socioeconomic environment to smooth the progress towards a knowledge economy.

From this viewpoint, the next section focuses on the divergent influences that pension systems exert on the socioeconomic environment, especially in terms of their growing importance in public policies and systems in recent years.

III Pension Products, Corporate Pension Plans and the Public Pension

1 The Strengths and Weaknesses of Pension Products

If asked to describe a typical pension, most people would likely say that it's a system that pays a person a determined amount of money at regular intervals from a cer-

tain age to that person's death. Such mechanisms can greatly reduce the anxiety of retirees over whether they might outlive their assets. In actual financial markets, moreover, companies are selling individual pension products such as period-certain annuities and lifetime annuities, in which the younger generation is also highly interested.

Compared with other markets such as that for life insurance, however, the size of the market for individual pensions is not very large. This is true even in the United States, where high-income individuals are motivated to use pension products as a measure to improve tax efficiency in terms of investments and as a hedge against the risk of living longer than anticipated. Individuals with little invested in current assets are not yet taking advantage of pension products.

These people do not choose pension products because they are dissatisfied with the operational efficiency of financial services firms that handle pension products, lack the skills to deal with the reverse-selection problem, or have inadequate asset investment skills. After all, the same can be said for life insurance products. Rather, pension products themselves are responsible.

When deciding to convert a specified amount of assets into a pension, you must first consider how long you are likely to live, and take into account future changes in the interest rate as well as future changes in your own health. Significantly, you have only one chance to decide when to convert assets to a pension because it is not possible to reverse the decision. Even if an advantageous investment opportunity should appear, pension assets cannot be made liquid. And, even if you think it's possible to stay young and want to begin a new life style, it is impossible to flexibly divert part of the pension assets. Finally, should your health deteriorate unexpectedly, you cannot leave the unused pension assets as an inheritance for beneficiaries you select.

From the perspective of liquidity, flexibility, and bequeathing your assets as you may wish, you will find that there are substantial advantages in delaying the decision as long as possible when converting assets to a pension. Making a rational judgment without regret, however, is quite difficult.¹⁰

Despite these weak points, pension mechanisms stand at the core of corporate and public pension systems. Furthermore, the tax system is designed to reinforce pension schemes by allowing deductions from both personal and corporate income taxes for contributions to the system. There are also other preferential treatments under the tax code, such as generous tax rates for pension income or the application of a special tax treatment for retirement bonuses when benefits are paid.

Asked why a pension system is so important, you will probably say that it arises from the needs of social policy. Every society includes myopic individuals who do not think much about their future, as well as careful planners who experience some misfortune such as unemployment

that wipes out what they've put aside for their old age. And there are individuals who make suitable preparations but find their preparations inadequate because they live much longer than they expect. We recognize that when society fails to adopt a proper social policy to meet such situations, those individuals not only suffer despair but also become an excessive burden for their children and the society at large.

As a specific policy, it is appropriate to provide the means for people to maintain a certain living standard regardless of the age reached. Pension benefits have thus become the most straightforward procedure to accomplish this goal.

It would be correct to say that Japan—like other advanced nations—has almost eradicated the problem of poverty among the elderly through enhancements of the pension system. But the present pension system does more than alleviate poverty; it has become an immense system that encompasses huge sums of contributions and benefits that have a long-term effect on most members of society.

For that reason alone, the disincentive effects the pension system exerts on individuals and companies are also increasing. We will probe these broader effects in the following and look separately at corporate pension plans and the public pension system.

2 Corporate Pension Plans That Overemphasize Stability

When we look at the United States historically, we recognize that corporate pension plans were introduced in line with the objective of retaining the best employees on the one hand and inventing retirement on the other. In other words pensions stimulated long-term, stable employment designed to raise labor productivity through the acquisition of skills, and made certain that individuals would exit the labor force when they reached the age when the productivity curve reached its apogee.

Japan developed defined benefit corporate pension plans such as Employee Pension Funds out of the retirement bonus system to create a mechanism for conferring the right to receive pension benefits or a retirement bonus through a long period of service. In many cases, the amount of the pension benefits was linked to the retiree's final salary. In other words, the greater the number of years of service, the larger the amount of the benefit. Such a system has been useful in keeping able employees in a company and in improving employee motivation.

Although defined benefit corporate pension plans essentially have the character of deferred compensation, from the employee perspective they do offer the advantage of avoiding investment risk. In many cases, moreover, pensions receive preferential tax treatments and are a means of advantageously accumulating financial assets as well as an important source of income after retirement.

In order to survive in a new economic environment, however, companies must have the flexibility of being able to reorganize. But when they attempt to transform themselves through restructuring or M&As, the traditional defined benefit pension system often becomes an obstacle. The adjustment of benefit levels or the inadequate funding of pension liabilities often becomes a major issue before companies complete a merger.

We can observe the shift in the United States to defined contribution pension schemes such as the 401(k) plan at such times. It is difficult to imagine that defined contribution pension schemes were designed for a knowledge economy. When we look back, however, we see that 401(k) plans only became truly widespread in the 1990s—although they were authorized by the United States Internal Revenue Service as far back as 1981. This time lag exactly overlaps the period during which the US economy was shifting to a knowledge economy. For instance, if we take the spread of personal computers as a likely variable that indicates when the knowledge economy started to bloom, we can see a close correlation with the rise of defined contribution pension schemes (Figure 4).

In other words, once the diffusion of personal computers had advanced quantitatively and qualitatively through conversions to LANs and connections to the Internet, the significance of information as the source of added value grew and simultaneously accelerated the change in the forms of employment (i.e., the rise of telecommuting and SOHO environments). By ensuring portability and the democratization of risk-taking, we believe that defined contribution pension schemes functioned as an incentive that ideally suited these changes.

In addition, defined contribution pension schemes were introduced into high-tech industries and investment banking, where many new workers promoted innovation. In

other words, such plans were welcomed as consistent with the needs of those industries that supported the knowledge economy.

In Japan firms do not flexibly use pension systems as part of their employee incentive systems based upon industry characteristics or strategies. Japanese pension systems are strongly colored by their uniform support of social policy. It is often said in the US that one's retirement should be supported by a three-legged stool, with each leg representing the public pension, the corporate pension and one's own savings, respectively. Using the same analogy, the situation in Japan is closer to what might be called a "two-legged stool," because the public pension and corporate pension plans are bound together.

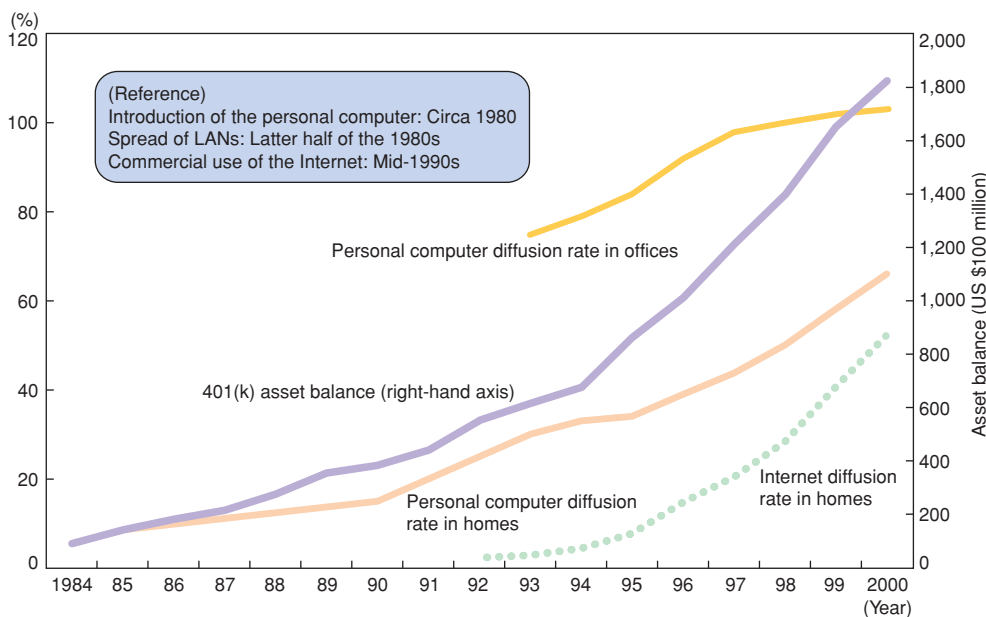
3 The Vicious Circle Generated by the Current Public Pension

(1) The social contract that reduces the birthrate

Every public pension has the aspect of a social contract between generations. For children who have the ability and desire to receive an education but who lack sufficient resources, the adult generation helps with the educational investment through its tax burden. And when these adults reach old age, they expect that the children who have now grown up and begun to work will help provide pension benefits through the burden of their contributions. If it's possible at such times to expect the educational investment in children to result in a high return, a social contract that is beneficial to both generations can be arranged because the social pie as a whole becomes larger.¹¹

The prototype of this idea can be recognized in the informal insurance function of income transfers between generations within families. We can see it as linked to

Figure 4. Diffusion of Personal Computers and 401(k) Assets



Note: LAN = Local Area Network.

Source: Compiled from data from the US Department of Commerce and SIA (US Securities Industry Association).

the tacit agreement by which the parental generation invests in the quantity (number) and quality (human capital) of children, in return for receiving the children's help when the parents have aged, so that each generation helps the other through its earning power. This creates an incentive in the parental generation to increase both the quantity and quality of children, for through such efforts they can expect that their children will financially and materially support them in later years.

This relationship still functions adequately enough today in many cases. Along with the transition to a matured society and the geographic dispersion of family members, however, the risk has increased that the tacit parent-child contract will end without being fulfilled. Indeed, we can now observe the strongly growing tendency of parents to see children as pure consumer goods and raise them entirely for love and to expect only psychological support in old age. As a result, the incentive to invest in the quantity and quality of children is itself weakening. If we assume that the marginal value of children as consumption goods decreases for a second or third child compared to the first, then the weakened condition of the family insurance function will increase the economic effect and reduce the birthrate.

Let's return at this point to the discussion of a pension system as a social contract to consider it as a substitute for the family insurance function. There is, however, one major difference. We'll assume that the pension payouts a beneficiary receives have no relationship to whether the children are one's own or those of others (even if the beneficiary raises many children or high-quality children). This indifference leads us to reducing the birthrate and our enthusiasm for education.¹²

(2) Increasing the real tax on young people

A public pension system such as the present Employee Pension Insurance in Japan causes further complex problems. First, because it has adopted a pay-as-you-go funding method, it always has a future liability that is not covered by reserves. In other words, because it meets the retired generation's benefits with contributions paid by the generation currently working, a future liability is automatically generated that corresponds to the number of individuals and the years remaining in their lives when those who are currently working eventually retire.

Furthermore, the nature of this system means that if retirees receive an amount corresponding to a set percentage of the income they used to earn, any population change that increases the number of recipients and relatively decreases the number of workers or any decline in the rate of economic growth will unavoidably lead to a rise in the contribution rate shouldered by the currently working generation.¹³ This fundamental problem of the pay-as-you-go public pension system highlights its character as essentially assessing a tax on young working individuals and transferring this amount to the retired segment of the population.

We would like to consider this further by separately examining the problems related to younger individuals and the retired segment. First, when we assume that pension benefits are fixed at present levels, the contributions made by young workers exceed the insurance premium (in an actuarial sense) that corresponds to the workers' future pension benefits. The government's collection of this difference (contribution amount – the insurance portion) from young workers is therefore equivalent (in an economic sense) to imposing an income tax on wages (Figure 5). In terms of the economic effect, this is identical to a normal income tax on wages and will result in a negative influence on worker morale, the labor supply and the formation of human capital.

Next let's turn our attention to the benefits for the retiree segment. The amount of this insurance payout exceeds the insurance benefit portion (in an actuarial sense) corresponding to their past contributions. This difference (benefit amount – the insurance benefit portion) is equivalent (in an economic sense) to transferring income from young working individuals to retirees (Figure 6).¹⁴

(3) The pursuit of quantity over quality of life

What's more, the total amount of pension benefits including transfer income increases in proportion to the recipient's longevity. What kind of economic effect does this bring about?

Let's first assume there is no pension. Retirees will allocate part of their assets to investments in their health to live longer. Since they must set aside specific assets including an amount for the increase in consumption as they prolong their lives, the level of consumption per year (i.e., their standard of living) will fall because such investments in health will reduce consumption. Therefore retirees will design their optimal lives while considering the trade-off (a mutually exclusive dichotomy) between the quantity of life (longevity) and the quality of life (standard of living).

Now let's assume that there is a retirement pension. When retirees live longer because of investments in their

Figure 5. Contributions by Young Working Segment

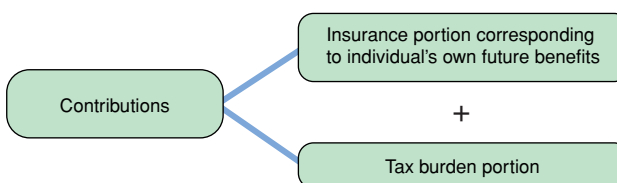
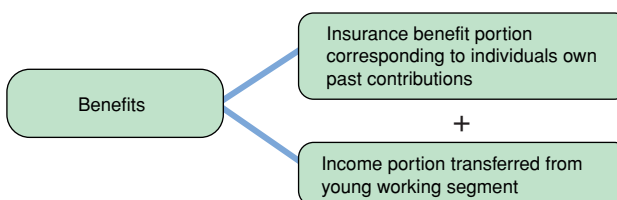


Figure 6. Benefits Paid to Retired Worker Segment



health, they can receive pension benefits corresponding to this increased longevity. Someone must bear the burden to cover these additional pension benefits. When the benefits are not linked with the burden, however, as occurs in a pay-as-you-go public pension, retirees are likely to take into consideration only their pension benefits. As a result they will be encouraged to make even larger investments in health, thereby extending their life spans even further.¹⁵

Although this is the economic effect of pension benefits, it also creates an intergenerational transfer of the burden for medical costs from retirees to working individuals. Since the retiree bracket picks up only a small portion of their actual medical treatment costs, both the incentive for and effect of living longer grows stronger, adding additional impetus to the trend towards a longer life span.

Consequently, the present public pension system weakens the incentive to raise many children and throw one's efforts into their education and training. In addition it has an adverse effect on the desire to work and invest in human capital. Finally, it generates an additional incentive to extend life spans. Even if we resolve the pension funding problem by substantially raising the pension contribution rate, this would do nothing to eliminate these other effects.

(4) Vicious circles and how to cope with them

While the present public pension system ensures a specified consumption lifestyle for retirees through income transfers, it gives rise to economic effects that seriously damage socioeconomic efficiency, and it also involves mechanisms that further harm pension funding. Not only does the system itself have a negative effect on the number of young workers and on human capital (thereby reducing the total contributions), it also helps retirees live longer and increases the total benefit payout.

Under the present system, moreover, unless considerable economic growth continues in the future, any increase of the tax burden portion included in the contributions of working individuals only lowers their real disposable income. When this occurs, rather than realizing the idea of a social contract between generations, the confrontation between generations becomes more acute.

Finally, we cannot overlook the effects on corporate activities. Public pension contributions are paid half by employees and half by their firms. The portion paid by the company is the same as an explicit tax, and it is projected that over the long term this is shifted to employees in the form of reduced wages. Over the short to medium-term, however, it becomes a factor that raises labor costs and reduces a company's earnings. This hinders the growth of employment and actually works in the direction of promoting unemployment.

What, then, is the most effective policy to resolve these problems? We believe it lies in establishing appropriate benefit levels at the earliest stage possible. Otherwise, future liabilities will balloon immensely unless the num-

ber of individuals retiring under the present system declines. It will become difficult to make corrections later and we will see remarkable increases in the tax burden imposed on the working segment and in the income shifted to retirees. This will serve only to intensify the various adverse effects described above.

When we turn our attention to the public pension system in the United States, we find the funding method is a pay-as-you-go method. This system shares many problems with that in Japan, such as the oldest members of the baby-boom generation reaching retirement during the first ten years of the 21st century. The pension contribution rate of 12.4 percent, however, is substantially below Japan's current rate of 17.35 percent (unlike Japan, however, the employee portion is 6.2%, which is not deducted from the taxable base for the personal income tax but collected as social security tax), and pension benefits are at a moderate level. In addition the demographic structure encompasses many young people and the ratio of the retirement layer to the working population is small in comparison to Japan. Therefore the future liabilities facing the public pension are far lower, and the disincentive effects of the public pension are thought to be much smaller than in the case of Japan.

Still, the government's advisory committee conducted a full-fledged study of public pension system reform and presented its draft of a reform bill in 1997. There are essentially three proposals: (1) increase the contribution rate and reduce benefits; (2) set up individual accounts as a supplement to the present system; and/or (3) transfer a specified percentage of the present contributions to individual retirement accounts.¹⁶ During his US presidential election campaign last year, President Bush pushed a strategy that closely resembled proposal (3), and—judging by the unprecedented groundswell of interest in the reform discussions—US citizens have taken a deep interest in the issue and the various proposals that have been put forward.

IV Pension System Reform for an Emerging Knowledge Economy

1 The Importance of Pension System Design

New technology and knowledge brings immense potential benefits. We discussed in Section II how Japan should also turn towards a knowledge economy. One observer who has participated in the World Economic Forum in Davos over many years noted the following after this year's gathering:

The conference where leaders from around the world gather has ended, and quiet has once

again returned to the village of Davos. Undoubtedly the conclusion of many of the participants, writ large in the pure-white snow, was 'Back to Basics (B2B)...' The excessive expectations for the New Economy with the IT revolution as a lever have disappeared. The IT revolution has only just begun, however. It will take time, but it will surely change our approach to economics and society and people's lifestyles.

The long-term stagnation of Japan's economy is a surprise to the world. In order to break free from its doldrums Japan has no choice but to deal with the negative inheritance from the failure of government policies and management of the past and hasten structural reforms to accommodate the new technological paradigm.¹⁷

Accordingly, this section looks at how Japan should prepare its socioeconomic environment for the future and move forward by seriously promoting a knowledge economy, and also examines the orientation the pension system should have in order to be consistent with this objective.

In Section II we examined the interaction of various aspects of the emergence of a knowledge economy and its socioeconomic environment. In Section III we confirmed the various disincentive effects brought about by corporate pension plans and the public pension system, respectively.

In this section we will begin by synthesizing the economic effects of corporate pension plans and the public pension to arrange them in accordance with various aspects of the socioeconomic environment. Table 1 shows the results.

It is only natural that a pension system has large direct and indirect effects on the labor market. In addition, moreover, a pension system can have a broad impact in ways that negatively affect the birthrate as cited previ-

ously. In short, regardless of the system's purpose, it will invariably hinder or promote the emergence of a knowledge economy depending on how it is designed. When we view Japan's current pension system as a whole, we are concerned about its powerful disincentives vis-à-vis future developments leading to the development of a knowledge economy.

Among these economic effects, however, we have not thoroughly discussed the significance of their impact on transfers of labor and entrepreneurial activity. We will amplify these effects here.

Let's think about periods when innovations in technology and knowledge become more dynamic. Because the return on human capital that can exploit new technology and knowledge increases at such times, sectors with advanced technology and knowledge attract individuals who have accumulated advanced education and training. This shift in the workforce then further promotes innovations in technology and knowledge.¹⁸

Entrepreneurial activity plays an especially important role in this process. The reason is that the productive activities of individuals representing highly developed human capital are accomplished primarily through participation in company organizations. By displaying its function in starting new company organizations and reforming the organizations of existing firms, entrepreneurial activity works to provide even better opportunities for individuals with highly developed skills. If this activity is not dynamic, the movement of workers to sectors with a high potential for innovation will not proceed smoothly.¹⁹

Incidentally, individuals who are influential in reforming company organizations belong to a bracket that is specialized in deepening entrepreneurial skills. Let's broadly classify those individuals who make up highly accomplished human capital into one bracket that is specialized mainly in entrepreneurial skills, and the other bracket that is specialized chiefly in professional skills.

Table 1. Effects of Pension System on the Socioeconomic Environment

Socioeconomic environment	Effect of present pension system
Lifestyles	<ul style="list-style-type: none"> • Provides means to advantageously form assets • Ensures specified level of consumption even in old age • Places greater emphasis on quantity (longevity) than quality of life • Negative effect on birthrate • Weakens self-help impulse
Labor market	<ul style="list-style-type: none"> • Weakens transfers of labor • Negative effects on desire to work, labor supply and formation of human capital • Restricts expansion of employment and increases unemployment
Company organizations	<ul style="list-style-type: none"> • Increases employee motivation to stay with one firm • Leads to smooth retirement at a specified age • Hinders organizational changes and restructuring
Market infrastructure	<ul style="list-style-type: none"> • Weakens risk-taking and restricts entrepreneurial activity • Obstructs reallocation of resources through processes such as M&As
City functions	<ul style="list-style-type: none"> • Weakens city functions by accelerating population decline
Financial and capital markets	<ul style="list-style-type: none"> • Accumulates capital that can be invested over long-term investment periods by institutional investors

Although both types contribute to technology and knowledge innovation, the contribution of the former is relatively larger than that of the latter.

One major characteristic of entrepreneurial activity is the substantial risks involved. Individuals learn much of such activity through actual business experience and the experience of failure. Much of this activity demands the ability to focus, and toughness with respect to the allocation of time and mental and physical energy. Professional activity, on the other hand, is relatively secure methodologically. Individuals can learn many professional skills from an academic education, and time can also be methodically allocated to tasks.

Investment in highly developed human capital is usually induced as an economy develops, but in the area of relatively secure professional activities it is quite typical that more varied opportunities will open up sooner or later. As a result, the investment in professional skills increases while the investment in entrepreneurial skills tends to get pushed aside. When this happens, it will lead to adverse effects on innovations in technology and knowledge.²⁰ Certainly these tendencies arise easily with economic development, and a pension system exerts an additional impact.

As mentioned above, companies in Japan have developed corporate pension plans from the retirement bonus system, and the right to receive benefits is not worked out precisely. Besides, portability is limited and in many cases the benefits are linked to the final salary based on a wage system that contains a years of service element. This strengthens an employee's vested interests in the wage system and makes the reassignment of labor within an organization difficult, even if productivity changes over time. Naturally this system also restricts risk-taking when people intend to leave the organization to establish another business.

When the public pension system assumes a major role, it becomes easier for retirees to feel that they are qualified to receive suitable benefits even if they are not making contributions that correspond to the benefits. Those who are working now also become more likely to take the future benefits into account and neglect making reasonable provisions for their own retirement. Moreover, as mentioned above, the pension benefits lead people to stress the quantity rather than the quality of life. When this sense of reliance on the public pension permeates the value system of society as a whole, the self-help mentality weakens and the desire to invest in high-risk entrepreneurial skills is likely to wither.

2 The Orientation of Pension System Reform

What kinds of systems are desirable to eliminate these drawbacks? Basically we believe the following are the most appropriate approaches: (1) corporate pension plans that enable each firm to flexibly select a pension according to its management needs; (2) a public pension sys-

tem that incorporates individual pension accounts; and (3) the creation of an environment that makes self-help easy to pursue.

By creating corporate pension plans to select various systems, individual firms and employees will be able to utilize defined contribution plans when they determine their traditional corporate pension plans do not improve operating results as a compensation strategy. Moreover, a public pension that incorporates individual pension accounts will make each person lead a well-ordered life in terms of consumption through compulsory savings of a fixed percentage of income. Such a system would not greatly distort the intergenerational relationship. In view of the weakness of pension mechanisms, however, we must say that forcing an excessive amount of savings into pensions would be undesirable.

By clarifying each individual's assets, defined contribution corporate pension plans and a public pension with individual accounts will strengthen self-help mentality because the pensions will become an investment directly linking one's own contributions to post-retirement income. Therefore, if economic revitalization is most important, the pension system should be changed as exemplified in (1), (2) and (3) above to have important long-term implications.

Even if an individual pension account is introduced to the public pension system, the future liabilities already generated will not soon decrease, for the disincentive effects mentioned above will remain until pension system reform is complete. If a long-term vision is demonstrated, however, people's attitudes towards the future will greatly shift to correspond more rationally to a long-lived society.

There remains one major problem in common, however, should Japan decide to move toward defined contribution corporate pension plans and a public pension that includes an individual pension account and further strengthening of the self-help mentality. That is the basic argument over whether people in general will be able to adapt to determining asset management for themselves and to assume responsibility for the expected results. We would like to address this point below.

3 The Need for Financial and Capital Markets Reforms

As shown in Table 1, it should be possible to invest accumulated pension assets in long-term investments because risk tolerance is also expected to be high. In fact, corporate pension funds were the mainspring for investments in financial innovations such as the shares of high-risk venture companies, asset-backed securities and LBOs in the United States. Moreover, in recent years we have seen people are often required to make decisions regarding asset management in their own right. This phenomenon is remarkable not only in the US but also worldwide.

In Japan, however, pension assets have not fulfilled such risk-taking functions, nor have they democratized risk-taking. While we can point to various factors as the cause, the influence of financial regulations that place a premium on safety over many years is especially large.

Today, the implementation of an all-inclusive pension law is round the corner and will come in the wake of a Japanese version of the financial big bang and ERISA (Employee Retirement Income Security Act) in the United States. The pension environment is undergoing tremendous changes. Nevertheless, we cannot yet detect any signs of change in the flow of capital in Japan. Indeed, amidst the increasing financial turmoil we see the emergence of a kind of moral hazard, where the distorted distribution of assets centered on savings parked in safe havens remains uncorrected.²¹

However, we expect an inevitable change in the future because of factors such as deposit insurance (a system guaranteeing repayment to a specified amount). Even if the pension system recommended in this paper is created, however, many things need to be modified to enable individuals to manage their assets on their own and to take responsibility for the results.

The first is a full line-up of financial products. As our life plans become more diverse, financial institutions must provide products that help us inexpensively manage our assets in ways that are consistent with our objectives.

For example, we may turn to lifetime annuity products for extreme longevity. Possibly we will buy such annuities at age 70 and begin to receive the benefits at age 85, or other pensions that include an option to postpone the starting age to receive the benefit payments. If we assume the development of financial engineering, it should be possible even for private financial services firms to provide some annuity products that make up for the weaknesses of the pension system.

What Japan will need most in such a case is probably the improvement of the investment skills of institutional investors. With technical advances such as the Internet, even individual investors can obtain information at low costs that is equal to the information used by professional traders, although the time necessary to study such information and monitor individual stock movements will still impose some practical restrictions. Therefore, even if individuals bear the ultimate investment risk in the future through systems such as defined contribution pension schemes, the importance of products such as investment trusts offered by institutional investors is unlikely to decline.

Specifically, the improvement of investment skills will require the following: (1) increased accountability (in the case of pensions, establishing the trustee's fiduciary responsibilities); (2) a greater number of funds with long-term performance records; and (3) expanding the number of well-trained investment experts. Additionally the establishment of investment styles that enable investors

to evaluate the relative performance of certain funds is a must.

Moreover, when individuals bear the risk, companies will have to disclose investment product characteristics and investment results in a form that permits comprehensible and appropriate comparisons of information beforehand. While modern investment trusts are required to distribute a prospectus to investors, this is not necessarily useful in helping individuals determine whether the fund is heeding the objectives of their customers, or in creating simulations showing the investors what kind of future performance can be expected under certain economic scenarios. Therefore, basic infrastructure services (databases, magazines, etc.) should be enhanced to process and offer such information.

Next let us turn to the problem of providing investor education in order that individuals can profit from such information.

For asset management under a pension system, an investor must (1) clarify one's own life plan, (2) select the appropriate products to realize that plan from among many products that have various risk-return profiles, (3) construct a portfolio, and (4) properly adjust the portfolio while continuing to monitor it over a long period of time. It is a process that requires both knowledge and discipline. With regard to discipline, designing systems makes it possible to cope with the early withdrawal of a pension by imposing tax penalties on it. Nevertheless, it is quite hard to constantly keep up with the latest knowledge.

Companies in the US have made various efforts to make corporate pension plans attractive, for which they have frequently used in-house training and financial planning services, for example.

In Japan, where neither knowledge nor discipline has been valued very much even with regard to comparatively short-term investments, the lack of investor education is much more serious.

Although opportunities have recently become available to learn investment theory at graduate schools (especially at business schools), there are few places that target general employees. Considering it will take time to improve the educational results, we need to take more immediate measures to provide these opportunities. Specifically, we should create workplace study opportunities in companies and individual guidance via the Intranet, for example, or simulation tools and financial planning services that provide pure investment advice on an independent, non-commissioned basis.

Regardless of how the education is carried out, however, not all individuals will necessarily make reasonable selections and investments. Nevertheless, viewed from the standpoint of consistency with the emerging knowledge economy, it is impossible to impose all risks on individuals. Thus, as pointed out by Professor Robert Merton of the Harvard Business School and recipient of the Nobel Prize for his contributions to financial engi-

neering, financial services that have taken “one step forward” can be expected to appear in the private market.²²

These services include pension products (options) designed for extreme longevity and other products (or combinations of products) designed to shoulder the non-investment risk such as a rise in education expenses or housing prices to substantiate life plans. Through such products, individuals will begin to independently construct portfolios that integrate financial assets and human capital.

Just as problems such as the declining birthrate further aggravate the difficulties of Japan’s present pension system and give rise to the disincentive effects that are likely to nullify it, many difficulties are causing Japan’s present financial and capital markets to suffer because these markets are unable to adequately supply capital to new industries—including venture companies that will be responsible for the advent of a knowledge economy. This may lead to another vicious circle.

As described at the beginning of this paper, the present pension system has an impact that stretches over the long term so that Japan must begin necessary reforms immediately. Japan should also accelerate reforms of its financial and capital markets before it becomes too late to mend them.

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