
Mizuho Economic Outlook & Analysis

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The impact of the fall of interest rates upon retirement benefit obligations of Japanese corporate enterprises

*While the impact on a macro basis will likely be minimal, some
corporations may suffer an unexpected blow*

< Summary >

- ◆ Long-term interest rates are falling ever since the implementation of negative interest rates. Looking forward, the value of credits and obligations calculated on the basis of discounted present value may be affected by the decline of interest rates. Of the various credits and obligations, we shed light upon retirement benefit obligations, which falls within the purview of a long-term debt, and estimated the impact of the falling interest rates. Our estimates revealed that while its impact on a macro basis appear limited, some corporations may need to address its potential negative impact.

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The Bank of Japan (BOJ) decided upon the implementation of negative interest rates at its Monetary Policy Meeting in January. The objective of this move is to invigorate the corporate and household sectors by lowering the level of real interest rates. Nevertheless, a decline in interest rates may also produce unintended effects. In this report, we estimated the potential impact of the fall of interest rates on the retirement benefit obligations of corporations in Japan.

1. What is the “discounted present value”?

First let us explain through example the concept of discounted present value. Let us assume that we have the rights to receive one million yen today and the same amount one year from now. Although the amount of money to be paid is the same in both cases, the two rights are not of equal value. If we deposit the one million yen received today at a 1% interest rate, the value of the deposit to be paid one year from now will increase to 1.01 million yen. This means that even if the amount to be paid is the same, the money received one year from now will lose the value of the interest. So, one million yen one year from now carries less value than one million yen today. And if we extend the period to ten years from now, the present value becomes even lower. The idea of discounted present value is to convert future value into present value. This concept can be expressed in the simple formula of “present value = future cash flow \div [(1+discount rate) \wedge years].” The weight applied to calculate the present value is called the discount rate. In the case where there is no need to take into account risks, etc. on the future cash flow, we may simply assume that the discount rate is equivalent to the value of the interest rate. As we can see in the above example, the discount rate and period are the two important factors when calculating the present value of the future credit (obligation) amount.

2. Will a change in the discount rate affect retirement benefit obligations?

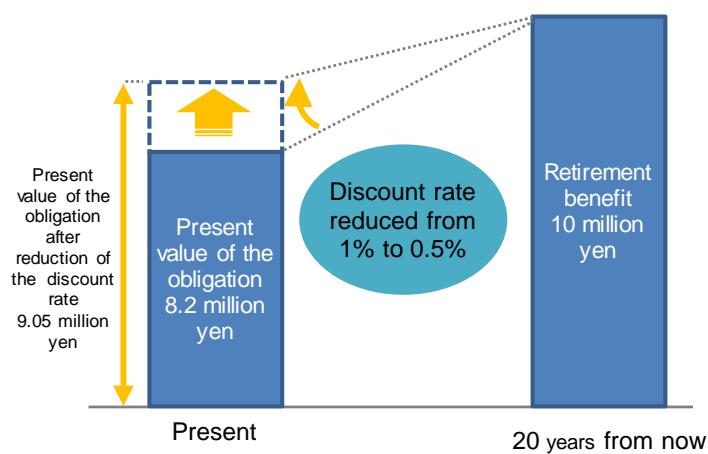
The retirement benefit obligation is one of the obligations which corporations calculate using the method of discounted present value by referring to market interest rates among various other indicators. For example, assume a company will pay a retirement benefit of 10 million yen to its employee retiring 20 years from now (**Chart 1**). Although this obligation is due in the future, its present value is about 8.2 million yen given the discount rate of 1%. If the company deposits 8.2 million yen today, its value will rise to 10 million yen 20 years later. To make it simpler, it would suffice if the company recognizes the value of its obligation as 8.2 million yen. But what if the discount rate drops to 0.5%? Recalculating the present value, the amount of obligation

would then rise to 9.05 million yen.

Thus, the bottom line is that the decline in interest rates prevailing since the adoption of the negative interest rate policy may have such an impact on the corporate sector.

However, the actual impact on corporate accounting will be mitigated by “the principle of changes in the discount rate” and “the calculation period of actuarial gains/losses.” The former principle holds that the discount rate does not require revision if the change in the obligation amount calculated using the previous discount rate and the revised discount rate is not overly significant, and the latter rule states that even if there is an impact upon the amount of obligation, the impact can be recognized proportionally over a certain period prescribed beforehand. While changes in the discount rate affect the amount of retirement benefit obligation, the “Accounting Standard for Retirement Benefits” stipulates that “in the case where there is no significant change on the basis of calculations such as the discount rate, etc., the retirement benefit obligation need not be revised,” and if the change in the amount of retirement benefit obligation is under 10% of the original value, the same discount rate applied at the preceding fiscal year-end can be used. Furthermore, even if the amount of retirement benefit obligation grows sharply as a result of a significant fluctuation in the discount rate, the increased amount of obligation will be recognized proportionally over “certain years within the average remaining service period” in the profit and loss statements.

Chart 1: Concept of the retirement benefit obligation and discount rate



$$\text{Before revision: } 10 \text{ million yen} \div (1 + \text{discount rate } 1.0\%)^{20 \text{ years}} \doteq 8.2 \text{ million yen}$$
$$\text{After revision: } 10 \text{ million yen} \div (1 + \text{discount rate } 0.5\%)^{20 \text{ years}} \doteq 90.5 \text{ million yen}$$

Source: Made by MHRI.

3. An estimation of the impact on listed corporate enterprises of Japan

When corporations discount their future retirement benefit obligations into present value, they must apply the discount rate determined based on the yield of low risk bonds (Japanese government bonds (“JGB”), debt securities issued by governmental agencies, and blue chip corporate bonds at the fiscal year-end). The yield actually referred to the most is for long-term JGBs, such as the 20-year bond. With the implementation of negative interest rates, the interest rate of the 20-year JGB fell by about 0.6% (a decline from January 28 through March 22).

To calculate the impact, we covered 1,183 listed corporate enterprises of Japan for which financial data are available. These corporations have recognized a total amount of 32.9 trillion yen as their retirement benefit obligations in the latest fiscal year. Although it is difficult to come up with the exact impact since their respective payment periods (duration) vary depending on their employee service periods, if we assume the average duration for all firms to be 20 years with a 0.6% decline in the discount rate, its impact on their ordinary profit would be -525 billion yen, a 2.8% drop from the ordinary profit booked in the latest fiscal year. It should be noted that if we change the average duration to 10 years, the impact of a 0.6% decline in the discount rate comes within the scope that does not require a revision to the applicable discount rate according to “the principle of changes in the discount rate.”

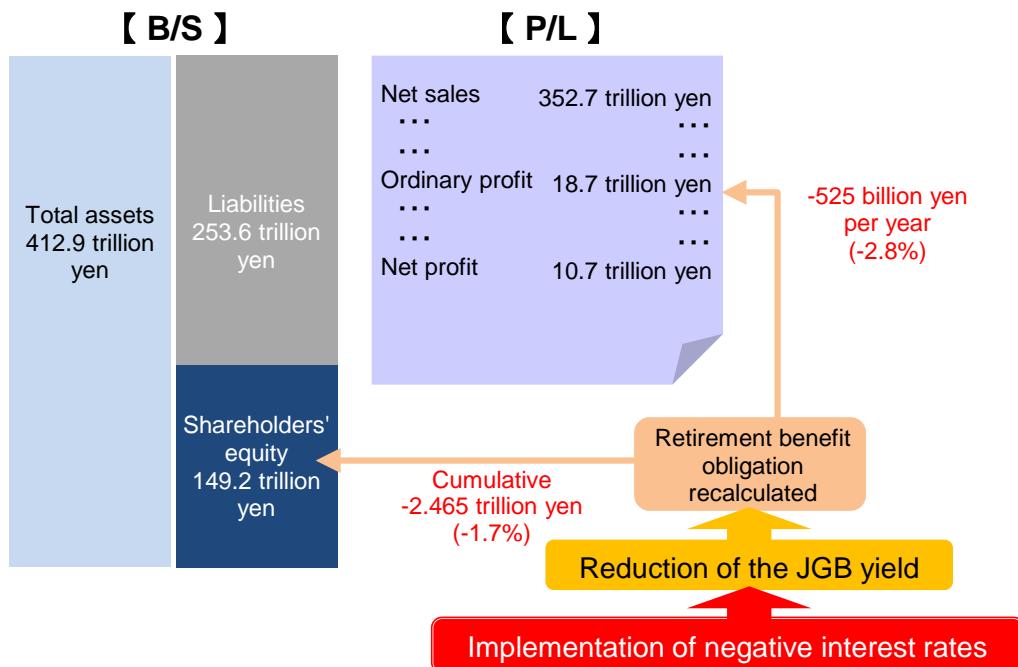
For small and medium-sized enterprises (referring to corporations with capital of 10 million to 1 billion yen), we did not calculate the impact due to the lack of financial data. However, based upon the assumption that major corporations listed on the stock exchange have a greater amount of future obligations given their substantial pension and retirement benefit plans, the impact of a decline in interest rates on smaller enterprises is believed to be limited compared with major listed corporations.

While we recognize the presence of various opinions regarding our estimation results, we believe that it would be fair to conclude that the impact on a macro-basis is not necessarily large.

Having said so, on an individual basis, 12 corporations in our coverage will see their ordinary profit drop by more than 50% from the previous fiscal year. Furthermore, for some corporations, the absolute impact is greater than its ordinary profit recorded in the preceding fiscal year. Since the influence on retirement benefits is not consistent across all corporations due to differences in their corporate history and employment conditions, some corporations may suffer a greater impact on their earnings. If long-term interest rates stay low in the future, some corporations subject to this greater impact may switch their pension plans to a defined contribution plan in order to limit the increase in the

value of their future obligations.

**Chart 2: Estimate of the impact of reduced interest rates on listed corporations
(1,183 corporations)**



- Notes:
1. The above chart covers 1,183 listed corporations for which financial data are available.
 2. The above figures are MHRI's estimates assuming the duration of 20 years and a reduction of the discount rate by -0.6%. The impact on shareholders' equity assumes the effective tax rate of 35%.
- Source: Made by MHRI based on the data of Nikkei NEEDS.