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## **APPLICATION OF THE ACTUARIAL METHOD IN MEASURING PROVISIONS FOR FUTURE EMPLOYEE BENEFITS**

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**Summary:** Accounting regulations require enterprises to create provisions for future employee benefits. This applies in particular to provisions for long-term employee benefits, especially including the provisions for retirement gratuities and jubilee benefits. It is recommended to estimate such provisions using the actuarial method, which is based on financial mathematics, insurance statistics, demography and the risk theory. The role of the actuarial method in determining the value of provisions for future employee benefits, as well as the impact of changes in actuarial assumptions on current amounts of such provisions have been presented in this article. The results of changes in actuarial assumptions are the categories of actuarial gains and losses. These arise as an accounting effect of revaluation of provisions for employee benefits already existing at the balance sheet date. Besides establishing the carrying value of provisions for employee benefits and their consequences for the costs (revenue) of enterprises, possible ways for recognizing such provisions in the accounting books have also been indicated.

**Key words:** employee benefits, provisions for employee benefits, actuarial method, actuarial assumptions, actuarial gains and losses.

### **1. Introduction**

A properly functioning accounting system of an enterprise should provide multidimensional and reliable information about its financial position and assets to different user groups. This information must also include risk-related issues through the creation and presentation of provisions.

One group of such provisions is constituted by those intended for future employee benefits. Accounting regulations deal with the issue of provisions for future employee benefits in regard to their evaluation, recognition in accounting books and presentation in financial statements in IAS 19 and – indirectly – in IAS 37, while national solutions are included in the Accounting Act and National Accounting Standard No. 6 [Krajowy Standard Rachunkowości... 2008].

The basic legal document concerning accounting regulations in Poland is the Accounting Act of 29 September 1994. However, for a long period of time, it did not include detailed solutions directly regarding provisions for future employee benefits. It only enclosed a record that entities recognize accruals in the amount of probable liabilities for a current reporting period. These liabilities result from employer's obligation which is associated with future employee benefits, including retirement benefits as well as future benefits to unknown persons. The amount of such benefits can be reliably estimated, despite the fact that the date of occurrence of liability is still unknown. The record that provisions for future employee benefits (in accordance with the aforementioned requirements) are to be recognized under accruals was introduced by the amendment to the Accounting Act of 1 January 2009 (they should be presented as provisions for liabilities on the balance sheet).

National Accounting Standard No. 6 pertaining to provisions, accruals and contingent liabilities was introduced by the resolution of the Accounting Standards Committee on 14 October 2008. NAS No. 6 does not exclusively concern provisions for employee benefits; and, for this reason, it does not regulate this subject matter as broadly as IAS 19 – "Employee benefits". However, it does provide certain guidelines concerning the methodology of estimating provisions for future employee benefits, actuarial assumptions and ways of presenting these provisions in financial statements. The records of NAS No. 6 do not differ significantly from those of IAS 19, especially in regard to estimating the amount of provisions for future employee benefits. The degree of compliance of these records is defined by NAS No. 6 as basic.

It is widely accepted that the most reliable method of estimating the amount of provisions for future obligations to employees is the actuarial method, which employs financial mathematics, insurance statistics, demography and the risk theory.

## 2. The nature and classification of employee benefits

Employee benefits should be understood as all the forms of consideration given by an enterprise to an employee in exchange for service, which stem from [Łukasiewicz 2008, p. 35]:

- applicable law or industry arrangements,
- formal remuneration regulations, collective agreements, wage agreements, pension schemes and other arrangements between an enterprise and its individual employees, employee groups and employee representatives,
- informal practices that give rise to a constructive obligation.

Employee benefits may be provided to employees, their dependents (e.g. spouse, children) as well as third parties (e.g. insurance companies).

Employee benefits are very diverse. According to IAS 19, they can be divided into four main groups [*Międzynarodowe Standardy...* 2011, part A, p. 637]:

- short-term employee benefits,

- post-employment benefits,
- other long-term employee benefits,
- employment termination benefits.

Short-term employee benefits are employee benefits (other than employment termination benefits and equity compensation benefits) which are wholly due within twelve months after the end of the period during which employees rendered a related service. These include in particular:

- wages and salaries,
- social security contributions,
- paid annual leaves and sick leaves,
- profit-sharing and bonuses (if payable within twelve months after the end of a period),
- non-monetary benefits for current employees (such as additional medical care, housing, cars and free or subsidized goods or services).

Post-employment benefits are benefits (other than employment termination benefits and equity compensation benefits) which are payable after the completion of employment. They include:

- pensions,
- retirement gratuities,
- post-employment life insurance,
- post-employment medical care.

Other long-term employee benefits are employee benefits (other than employment termination benefits and equity compensation benefits) which are not wholly due within twelve months after the end of the period during which employees rendered a related service. This group of employee benefits includes mainly:

- sabbaticals,
- long-service leaves,
- jubilee benefits and other long-service benefits,
- long-term disability benefits,
- profit-sharing, bonuses and deferred compensation (unless they are not wholly payable within twelve months after the end of the period).

Employment termination benefits are employee benefits payable as a result of:

- a decision of an enterprise to terminate employment before employee's retirement age,
- an employee's decision to accept voluntary redundancy in exchange for those benefits (as an incentive).

In practice, a category of equity compensation benefits is also distinguished, which arise when:

- employees are entitled to receive equity financial instruments issued by an employer (or its parent company),
- the amount of employer's obligations to employees depends on the future price of equity financial instruments issued by an employer.

### 3. The application of the actuarial method in estimating the amount of provisions for employee benefits

The creation of a provision for employee benefits signifies the disclosure of enterprise's future obligations towards employees, which, in the view of the definition of liabilities provided in accounting regulations, requires their reliable estimate.

To determine the amount of provisions for employee benefits, it is particularly important to divide them into:

- long-term provisions,
- short-term provisions.

In the case of long-term provisions for employee benefits, nominal amounts representing future expenses associated with employee benefits should be discounted. The valuation of such provisions should be carried out by means of the actuarial method, which is widely recognized as the most reliable way to measure their amount. This method employs actuarial mathematics, which in turn covers financial mathematics, insurance statistics, demography and the risk theory.

On the other hand, when valuating short-term provisions for employee benefits one does not have to take the difference of money value in time into consideration; therefore, such provisions can be measured at nominal value.

Polish companies mostly create the following long-term provisions for employee benefits:

- provision for retirement gratuities,
- provision for jubilee benefits.

These provisions are created whenever the law, collective agreement or employment contracts clearly state employer's legal obligation to render such benefits, and their amount is significant to enterprise's financial result.

The value of the long-term provision for employee benefits at the balance sheet date consists of:

- present value of an obligation,
- actuarial gains and losses.

The present value of the provision for retirement gratuities and jubilee benefits is determined at the balance sheet date, using the Projected Unit Credit Method, as the sum of provisions relating to individual employees or their homogeneous groups, calculated according to the following formula [Szydelko 2010, pp. 121–122]:

$$WBZ = \sum_{i=1}^n \acute{S}_i \cdot P_i \cdot D_i \cdot N_i,$$

where: *WBZ* – a present value of a benefit (provision) at the balance sheet date, or, in other words, the amount of future payments which are expected on this day, and which must be made by an employer to



- discharge the obligations arising from employees' employment in a financial year and previous years;
- $\dot{S}_i$  – a nominal value of a future benefit for the  $i$ -th employee as expected at the balance sheet date;
  - $P_i$  – a demographic probability of the benefit payment for the  $i$ -th employee;
  - $D_i$  – a discounting factor (it is recommended to adopt a discounting factor equal to the return on long-term treasury bonds with maturities coinciding with the date of benefit payment) for the  $i$ -th employee;
  - $N_i$  – the degree of benefit advancement measured by the ratio of the number of years in service to the number of years in the period after which the  $i$ -th employee is eligible for benefit payment;
  - $n$  – number of employees.

Entity's actuarial assumptions should be unbiased and mutually compatible (consistent). IAS 19 distinguishes two groups of actuarial assumptions:

- demographic assumptions,
- financial assumptions.

Demographic assumptions concern future characteristics of current and former employees who are eligible for benefits and deal with such matters as: mortality, both during and after employment, rates of employee turnover, disability and early retirement; the proportion of plan members with dependents eligible for benefits; claim rates within medical care plans, etc.

Actuarial assumptions of a financial nature mainly deal with items such as: discount rates, future salary and benefit levels, inflation rates, the expected rate of return on plan assets, future medical costs, etc.

The existing provision for pensions and jubilee benefits should be reviewed at the balance sheet date so as to consider the impact of changes in actuarial assumptions on the amount of future benefits, essentially due to changes in average wages, the inflation rate, the discount rate and the size and structure of employment. These changes necessitate an upward and downward adjustment of provisions for employee benefits, which are known as actuarial gains and losses. The actuarial gains and losses are to be distinguished from the costs of past employment arising due to changes in calculation rules of certain benefits, which are not accounted for at the balance sheet date, but which will affect the amount of provisions in years to come [Gmytrasiewicz, Karmańska 2006, p. 406].

The difference between the opening balance of the provision and the provision at the balance sheet date plus benefit payments actually made in the period constitute an allowance debited to costs of core activities for a financial year, thus becoming a part of the total cost of employment. Therefore, the amount of this allowance is affected both by the benefit payment and changes in estimates underlying the calculation of future benefits for which a provision is created [Fedak 2010, p. 145].

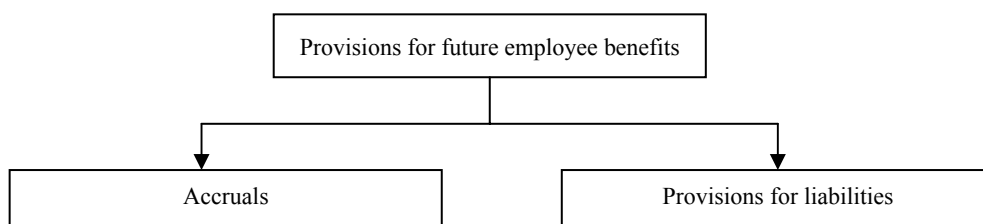
The carrying value of long-term provisions for liabilities associated with employee benefits includes the present value of an obligation (taking current payments into account) and adjustments for actuarial gains and losses.

#### 4. Recognition in accounting books and presentation in financial statements

A significant issue concerning future employee benefits is various possibilities of their accounting treatment. In the current Polish accounting practice, future employee benefits are recognized as:

- accruals,
- provisions.

The existing possibilities of the recognition of future employee benefits are illustrated by Figure 1.



**Figure 1.** Possibilities of the recognition of future employee benefits

Source: author's own work.

The recognition of future employee benefits as accruals is a relatively common solution used by Polish companies, which is fully approved in the regulations of National Accounting Standard No. 6 [Krajowy Standard Rachunkowości... 2008]. Establishing accruals for future employee benefits is then debited to the costs of core operating activities, whereas they can be posted in the same group within the classification of expenses by a function in which employee's remuneration is included, or they can be debited to only one group in this classification of expenses, namely, general and administrative expenses. Once a future obligation is discharged, assets will be reduced and a corresponding accrual item will be reduced (derecognized). If the grounds for disclosure of future employee benefits under accruals cease to apply, such items must be derecognized and relevant cost items in the classification of expenses by function must be adjusted. The recognition of future employee benefits as accruals is shown in Table 1.

The second way of accounting treatment of future employee benefits is their recognition under provisions. As a result, they have to be established, used and released with reference to expenses (revenues) of other operating activities. Such

provisions may be disclosed on a special account within group “8”, namely “Provision for employee benefits”. General principles for posting provisions for employee benefits are shown in Table 2.

**Table 1.** Establishing, use and derecognition of future employee benefits as accrual items

Item	Operation	Debit	Credit
1	Creating a provision; actuarial loss	Group “5” <sup>*</sup> accounts where wages and salaries are posted	Group “6” accounts for accruals
		An account in group “5” <sup>*</sup> : general and administrative expenses	
2	Provision use	Group “4” <sup>*</sup> accounts	Asset or liability accounts
		Group “6” accounts for accruals	An account in group “4” <sup>*</sup> : apportionment of primary expenses
3	Provision release; actuarial gain <sup>**</sup>	Group “6” accounts for accruals	Group “5” <sup>*</sup> accounts where wages and salaries are posted
			An account in group “5” <sup>*</sup> : general and administrative expenses

\* Numerical account group references are in accordance with the traditional chart of accounts used by Polish enterprises other than banks and insurance companies.

\*\* In order to keep the entries in income statement accounts clear, they should be posted as in item 1, but with a minus sign (reversal).

Source: author’s own work.

**Table 2.** Creation, use and release of provisions for employee benefits

Item	Operation	Debit	Credit
1	Creating a provision; actuarial loss	An account in group “7” <sup>*</sup> : other operating expenses	An account in group “8” <sup>*</sup> : provisions for employee benefits
2	Provision use	An account in group “8” <sup>*</sup> : provisions for employee benefits	Asset or liability accounts
3	Provision release; actuarial gain	Group “8” accounts	An account in group “7” <sup>*</sup> : other operating revenues

\* Numerical account group references are in accordance with the traditional chart of accounts used by Polish enterprises other than banks and insurance companies.

Source: author’s own work.

A solution recommended to practitioners in regard to recognition of provisions for employee benefits, which is in agreement with the National Accounting Standard No. 6, is to recognize them on accrual accounts. However, there are also opinions that jubilee benefits and retirement gratuities should be treated as provisions within group “8” accounts [Gierusz 2005, p. 519; Kalinowski 2008, pp. 667–668]. The latter approach should apply in particular to the provisions for employee benefits

resulting from the risk (e.g. the provision for employment termination benefits) rather than from the matching principle.

Regardless of the way provisions for employee benefits are recognized in accounting books, they must be presented in a financial statement (the balance sheet) as a component of provisions for liabilities under item B.I.2 "Provision for pensions and similar benefits", divided into long-term and short-term items.

Liabilities associated with employee benefits are presented as provisions in financial statements constructed in accordance with IFRS. In compliance with IAS 19, the value of provisions reported on the balance sheet does not have to be equal to the current liability amount estimated via actuarial methods. In the case of post-employment benefits resulting from certain benefit plans, IAS permits the implementation of specific rules in regard to actuarial gains and losses (an entity may decide not to report some of their components in a financial statement). This indicates that the provision is reported in the amount of the current liability value calculated by the actuary and adjusted for actuarial gains and losses [Zielińska, Kwasowiec 2009, p. 15].

## 5. Conclusion

Polish enterprises, especially small and medium-sized, regard establishing the provisions for employee benefits as an issue of marginal significance. Among other reasons this is caused by: the lack of conclusive practical solutions in regard to measurement procedures, accounting treatment and presentation methods of provisions and at times the reluctance of accounting staff and management. Many enterprises do not create such provisions at all, or establish only short-term provisions, whereas retirement gratuities and jubilee benefits are created under the long-term provision group.

Accountants' resistance to the creation of long-term provisions for employee benefits may be associated with the actuarial method being widely recommended by the accounting regulations to estimate such provisions, especially the cost of actuarial services and additional related responsibilities. Practical recommendations for enterprises that apply the Accounting Act suggest simplified solutions involving the use of actuarial services in an initial year and then every 2–3 years, assuming that there were no significant changes in the conditions adopted as actuarial assumptions in "middle years" [Fedak 2010, p. 146].

A conducive factor in the creation of such provisions by businesses was the emergence of the National Accounting Standard No. 6 [Krajowy Standard Rachunkowości... 2008], which, among other things, featured practical ways of measurement, recognition and presentation of the provision for retirement gratuities.

The times of crisis, which often cause the reduction of employment, have also changed the views of those responsible for the creation of such provisions, and

clearly reinforced the need for their establishment, particularly in regard to employment termination benefits. Simultaneously, the same crisis causes huge fluctuations in the existing actuarial assumptions, whereas the variability of assumptions in actuarial models is the cause of significant fluctuations in actuarial gains and losses, which as a result, leads to large corrections of such provisions.

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## ZASTOSOWANIE METODY AKTUARIALNEJ DO POMIARU REZERW NA PRZYSZŁE ŚWIADCZENIA PRACOWNICZE

**Streszczenie:** Prawo bilansowe nakłada na przedsiębiorstwa obowiązek tworzenia rezerw na przyszłe świadczenia pracownicze. Dotyczy to szczególnie rezerw na długoterminowe świadczenia pracownicze, w tym przede wszystkim rezerw na odprawy emerytalne i rezerw na nagrody jubileuszowe. Do szacowania wysokości tych rezerw zaleca się stosowanie metody aktuarialnej, która opiera się na matematyce finansowej, statystyce ubezpieczeniowej, demografii i teorii ryzyka. W opracowaniu zaprezentowano rolę metody aktuarialnej przy ustalaniu wysokości rezerw na przyszłe świadczenia pracownicze z uwzględnieniem wpływu zmian w założeniach aktuarialnych na aktualne wysokości tych rezerw. Konsekwencją zmian w założeniach aktuarialnych są kategorie zysków i strat aktuarialnych. Powstają one jako skutek księgowy przeszacowań istniejących już na dzień bilansowy rezerw na świadczenia pracownicze. Poza ustaleniem bilansowej wartości rezerw na świadczenia pracownicze i ich konsekwencji dla wysokości kosztów (przychodów) przedsiębiorstwa wskazano możliwe sposoby ujęcia tych rezerw w księgach rachunkowych.

**Słowa kluczowe:** świadczenia pracownicze, rezerwy na świadczenia pracownicze, metoda aktuarialna, założenia aktuarialne, zyski i straty aktuarialne.