“Challenges and Adaptations of IAS 19: Employee Benefits in EGYPT Evolving Economic and Actuarial Landscape”

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Abstract

The implementation of International Accounting Standard 19 (IAS 19), which governs the accounting and reporting of employee benefits, has presented several challenges in Egypt, reflecting broader issues experienced in emerging markets. IAS 19 mandates that entities recognize obligations for employee benefits, such as pensions and other post-employment benefits, with detailed disclosures on how these are measured and managed. However, adaptation in Egypt faces unique hurdles, including a lack of comprehensive actuarial data, limited local expertise in IAS 19 applications, and differences between international standards and Egypt's traditional accounting practices.

A key challenge in implementing IAS 19 in Egypt is aligning local regulatory requirements with the standard's complex stipulations. Egyptian entities must move from traditional accounting methods for employee benefits to actuarial valuations, incorporating assumptions regarding discount rates, inflation, and longevity. This shift requires specialized expertise, which is still emerging in Egypt's financial and actuarial sectors. Economic volatility and inflation further complicate these assumptions, making accurate long-term projections difficult.

While the IAS 19 has enhanced transparency and comparability in financial reporting, the complexities related to actuarial assumptions and the handling of remeasurements continue to pose significant challenges. Therefore, the role of the actuary becomes essential in ensuring the accuracy and reliability of the calculations, further strengthening the effective application of IAS 19 in determining and disclosing provisions related to employee benefits.

Keywords

Actuarial Assumptions, Accrued Benefits, Defined Benefit Plan, Defined Contribution Plan, Defined Benefit Obligation, IAS 19, Interest Cost, Normal Cost.

Introduction

IAS 19 was adopted by the International Accounting Standards Board (IASB) in February 1998. This accounting standard outlines the financial reporting procedures for employers in relation to their obligations toward "employee benefits." These benefits refer to any form of compensation provided to employees for their services to an entity (Hütten, et al., 2011).

In June 2011, the IASB released a revised version of IAS 19 "Employee Benefits", which became effective on January 1, 2013 (IASB, 2011). Before this update, the standard allowed for the recognition of actuarial gains and losses related to employee benefit obligations through three different approaches (Martinsson, et al., 2013).

- **Recognition in Other Comprehensive Income**: Gains and losses could be recorded in other comprehensive income.
- **Immediate Recognition in Profit or Loss**: Actuarial gains and losses could be directly recognized in the profit and loss statement.
- **Delayed Recognition Using the Corridor Approach**: This method allowed for the postponement of recognition in profit or loss until the gains or losses exceeded a predetermined threshold.

In contrast, the current version of IAS 19, following the latest amendment, mandates the immediate recognition of actuarial gains and losses related to employee benefit obligations in the form of provisions. Besides, the IASB introduced further amendments to IAS 19, which address changes in how entities provide employee benefits. These amendments require entities to reassess the assumptions made previously and, by extension, recalculate the costs of current services and net interest for the remainder of the reporting period.

Additionally, the last amendments aimed at ensuring that financial statements offer a transparent and accurate reflection of an entity's commitments arising from different employee benefit plans, helping investors and other stakeholders gain a clear understanding of these obligations.

Employee benefits are recognized and reported by entities in two main ways (Liapis, et al., 2013):

- **Direct Payments:** Made to employees and recorded in the profit and loss (P&L) account.
- **Provisions for Post-Retirement Benefit Plans:** These are divided into defined contribution plans and defined benefit plans.

The associated liabilities and expenses reflect the entity's obligations, whether mandated by law or through voluntary commitments, to provide these benefits to employees.

The employee benefits are divided into several categories as follows (Selimović, et al., 2021):

1- **Short-Term Benefits:** These are benefits that are expected to be fully settled within 12 months after the end of the reporting period in which the employees render their services. Examples include wages, salaries, social security contributions, paid annual leave, and paid sick leave. Additionally, profit-sharing and bonuses, as well as non-monetary benefits like medical care, housing, company cars, and other subsidized goods or services, fall under this category. These benefits are for current employees and are typically straightforward in terms of their accounting and reporting.

2- **Post-Employment Benefits:** These are benefits provided to employees after they retire, such as retirement pensions, lump sum payments, post-employment life insurance, and medical care. This category is further divided into two types: Defined Contribution Plans and Defined Benefit Plans.

3- **Other Long-Term Employee Benefits**: These are benefits that are not due to be settled within 12 months after the reporting period. They include long-service leave, sabbaticals, jubilee awards, and long-term disability benefits. These benefits often require more complex accounting, as they involve estimates of future employee service and associated costs.

4- **Termination Benefits**: These are benefits provided because of the employer's decision to terminate an employee or the employee's decision to accept a voluntary offer in exchange for ending their employment. Examples include severance payments and early retirement benefits. These benefits are typically one-time payments and must be recognized in the financial statements at the time the employer becomes obligated to provide them.

This categorization ensures that all employee benefits are properly recognized and accounted for, helping entities accurately reflect their obligations and expenses in their financial statements.

The post-employment benefit types can be classified to (Noja, et al., 2015):

- **Defined Contribution Plans:** In these plans, the employer's obligation is limited to paying fixed contributions into a fund. Once the contributions are made, the employer has no further obligation, even if the fund does not have sufficient assets to cover all benefits. The employee bears all the investment risk and actuarial risk, meaning that the final benefits received by the employee depend on the performance of the fund's investments.

Recognition of Contributions:

a) **As a Liability**: Contributions payable for employee services are recognized as a liability (accrued expense) after deducting any already paid contributions.
b) **As an Asset**: If the contributions paid exceed what is due, the excess is recognized as an asset (prepaid expense) if it will lead to future payment reductions or refunds.
c) **As an Expense**: Contributions are recorded as an expense unless specified otherwise by another standard (e.g., IAS 2 for inventories or IAS 16 for property, plant, and equipment).

- **Defined Benefit Plans:** These plans promise a specific level of benefits to employees upon retirement, regardless of the performance of the underlying assets. If the fund's assets are insufficient, the employer is required to cover any shortfalls. This introduces greater risk and complexity in terms of accounting, as it involves actuarial assumptions and ongoing obligations.

To manage the liabilities and expenses associated with employee benefits, an entity must undertake the following actions:

a) **Recognition of Liabilities**: Acknowledge the total liabilities for all employees and pensioners to ensure adequate coverage.
b) **Identification of Actuarial Risks**: Assess all actuarial risks related to the employee benefits program.
c) **Benefit Identification**: Determine the benefits resulting from the contributions made by both the employer and employees, which contribute to the overall provision over time.
d) **Conduct an Actuarial Study**: Perform an actuarial analysis to establish the current obligations necessary for providing coverage.
e) **Recognition of Current Obligations**: Reflect the entity's current obligations in its financial records. This recognition relies on actuarial assumptions categorized into two main groups:

Demographic Assumptions: In Egypt, applying IAS 19 requires careful consideration of demographic assumptions, particularly around employee mortality, turnover, and retirement age. These assumptions are essential for accurately estimating defined benefit obligations (DBOs), yet present specific challenges:

1) **Mortality Rates**: Accurate mortality data is less readily available in Egypt than in countries with established actuarial databases. Mortality tables widely used in other markets may not reflect Egypt’s conditions, especially outside urban areas where life expectancy and health standards may vary significantly. This limitation can lead entities to rely on global tables or regional approximations, which can misrepresent the actual longevity of employees and affect DBO calculations.
2) **Employee Turnover:** Understanding workforce turnover patterns is crucial for estimating future obligations, as high turnover rates may reduce long-term liabilities. However, in Egypt, turnover rates vary widely across sectors, making standardized assumptions difficult. Limited data on turnover trends complicates accurate projection of benefit

obligations, leading entities to adopt assumptions that might not align with actual workforce behavior.

3) **Retirement Age:** Standard retirement age assumptions may also differ from reality, as factors like the local labor market, socioeconomic conditions, and changing pension reforms influence when employees choose to retire. This variability impacts the timing of benefit payments, affecting the present value of DBOs under IAS 19.

To improve accuracy, Egyptian entities are increasingly exploring ways to tailor demographic assumptions by gathering local data and collaborating with actuarial bodies. By refining these assumptions to better reflect local conditions, entities can enhance their compliance with IAS 19 while gaining a clearer understanding of their long-term benefit obligations.

Financial Assumptions: It plays a crucial role in determining the present value of (DBOs) under IAS 19. In Egypt, these assumptions are challenging due to economic volatility, requiring adjustments to accurately reflect factors such as inflation, discount rates, and salary growth. Key financial assumptions include:

1) **Discount Rates:** The discount rate is essential for calculating the present value of future benefit obligations. Typically, discount rates are based on corporate bond yields; however, Egypt's underdeveloped corporate bond market means entities often use government bond yields as a proxy. These yields are volatile and carry sovereign risk, introducing uncertainty into DBO valuations and complicating compliance with IAS 19.
2) **Inflation and Salary Growth:** High inflation rates in Egypt, often reaching double digits, create uncertainty in projecting salary increases, which directly affects long-term benefit obligations. Accurate salary growth assumptions are vital, as underestimating inflation can lead to understated DBOs, while overestimating can inflate liabilities. Entities may need to update inflation assumptions frequently to maintain reliable IAS 19 reporting.
3) **Expected Return on Plan Assets:** In cases where defined benefit plans involve funded schemes, IAS 19 requires assumptions about the expected return on plan assets. Egypt's economic environment can lead to significant fluctuations in asset values, making this assumption particularly complex. Overly optimistic return estimates can reduce apparent liabilities, whereas conservative estimates may increase DBOs, impacting financial statements.
4) **Healthcare Cost Trends (for post-retirement healthcare obligations):** Although less common in Egypt, some entities offer post-retirement healthcare benefits, which require estimating future healthcare cost trends. In a high-inflation environment, projecting these costs accurately is difficult, yet crucial, as they can significantly influence overall benefit obligations.

In summary, financial assumptions under IAS 19 in Egypt require frequent adjustments due to economic instability. Entities are increasingly adopting stress-testing and scenario analysis to address these challenges, aiming to improve compliance and maintain accurate and stable reporting.

Using these Assumptions, the entity calculates the present value of employee benefits, deducting the present value of pension fund assets. The resulting actuarial liability may reveal an actuarial deficit, which should be recorded immediately as a liability and expense (Leier & R., 2015).

In practice, defined contribution plans are simpler and more predictable for employers, while defined benefit plans provide employees with greater financial certainty but impose higher financial and accounting responsibilities on the employer. Therefore, this paper will focus on the actuarial valuation of Defined Benefit Obligations (DBOs), where employers must recognize the present value of future employee benefit obligations as liabilities on their balance sheets. This requires the use of actuarial assumptions to assess these obligations accurately, determine the fair value of plan assets, and account for any actuarial gains or losses, which may be recognized in Other Comprehensive Income (OCI) or through profit and loss, depending on the context (Bodie, et al., 1988).

Literatures examine the impact of IAS 19 adoption on financial reporting quality and investor behavior. According to studies by (Lourenço, et al., 2013),enhanced disclosures about employee benefits, particularly defined benefit obligations, allow investors to make more informed decisions. The increased transparency provided by IAS 19 also promotes better comparability among entities, especially in industries with significant employee post-retirement liabilities.

On the other hand, (HAILEMARIAM & TAMERAYHU, 2018) found that the complexity of actuarial calculations may pose difficulties for smaller firms or those with limited accounting resources. Although IAS 19 enhances reporting accuracy, its practical implementation requires considerable expertise in actuarial science, which can be challenging for smaller entities.

Challenges and Adaptations of Applying IAS 19 in Egypt

Historically, Egypt's pension system has relied heavily on government-provided benefits through the National Social Insurance Scheme, with minimal private-sector involvement in retirement planning. This reliance left private pensions relatively uncommon until recent reforms, which introduced hybrid pension models that align more closely with global standards such as IAS 19. As Egyptian entities adopt defined benefit and defined contribution plans to meet international standards, they encounter significant challenges in adapting accounting practices to recognize and report pension liabilities accurately.

A primary challenge is the maturation of Egypt's financial sector, which makes compliance with International Financial Reporting Standards (IFRS), including IAS 19, increasingly important. This transition brings various obstacles, particularly in a country where

the actuarial profession is still developing and where economic volatility adds further complexity to actuarial assumptions.

Here's a breakdown of these challenges and strategies for adapting to them:

The following summarize the most critical challenges the faces the application of IAS 19 and the purposed adaptation strategies;

1) **Economic Volatility and High Inflation**

- **Challenges**: Egypt's high inflation rates significantly affect employee benefit obligations, particularly long-term liabilities like pensions and end-of-service benefits. IAS 19 requires regular updates to benefit projections, making accurate forecasting a challenge in a volatile economy.
- **Adaptations**: Actuaries have adopted scenario analysis, adjusting assumptions for various inflation scenarios. Regular recalibration of discount rates and benefit inflation adjustments helps manage liabilities, improving forecast accuracy despite rapid economic shifts.

2) **Currency Instability and Exchange Rate Fluctuations**

- **Challenges:** The devaluation of the Egyptian pound increases the cost of benefit obligations, especially for entities reporting in foreign currencies. This requires careful currency adjustment in financial reporting, as liabilities measured in local currency fluctuate in response to exchange rates.
- **Adaptations:** Entities are increasingly using currency hedging strategies to manage foreign exchange exposure. Some choose to report in a stable currency, when possible, to better align actuarial assumptions and IAS 19 valuations with the local currency's economic risks.

3) **Uncertain Actuarial Assumptions**

- **Challenges:** IAS 19 relies on assumptions about mortality, turnover, and salary increases, which can be difficult to predict accurately given Egypt's evolving demographics and labor trends. Traditional actuarial tables may not adequately capture these local patterns, affecting liability measurements.
- **Adaptations:** Egyptian actuarial firms are now working to create Egypt-specific actuarial tables to reflect local trends in workforce turnover, mortality, and salary growth. This collaboration with local and regional actuarial bodies helps to produce more reliable data for IAS 19 valuations.

4) **Regulatory Changes and Compliance**

- **Challenges:** Egypt's regulatory landscape is rapidly evolving, with fiscal year amendments and pension reforms creating inconsistencies that disrupt IAS 19 compliance and financial reporting.
- **Adaptations:** Organizations are setting up internal regulatory committees or partnering with local regulatory advisors to stay updated and responsive to changes. This ensures that employee benefits policies are compliant and adaptable to new regulations, fostering smooth reporting under IAS 19.

5) **Employee Expectations and Changing Benefit Preferences**

- **Challenges:** Employees increasingly expect international-standard benefits, which require entities to provide options that may not be sustainable within traditional defined-benefit plans.
- **Adaptations:** Many organizations in Egypt are shifting from defined-benefit to defined-contribution plans, aligning more closely with IAS 19 while addressing employee demands. This transition helps entities manage risk while providing benefits that appeal to the workforce.

6) **Shortage of Qualified Actuarial Expertise**

- **Challenges**: The limited availability of local actuarial expertise poses challenges for accurately valuing liabilities under IAS 19, as specialized skills are needed to adapt assumptions and methods to Egypt's unique economic conditions.
- **Adaptations**: To bridge the talent gap, organizations are working with international actuarial firms for expertise and training programs. This collaboration helps build a pipeline of qualified actuaries who are capable of handling local IAS 19 requirements effectively.

7) **Market Competition and Rising Benefit Costs**

- **Challenges:** The limited availability of local actuarial expertise presents challenges in accurately valuing liabilities under IAS 19, as specialized skills are required to tailor assumptions and methods to Egypt's unique economic conditions. While IAS 19 does not mandate that an actuary perform the calculations for the defined benefit obligation, this could lead to misleading or inaccurate valuations if the necessary expertise is not applied properly in the process.
- **Adaptations:** Engaging with external consultants and local actuaries with experience in IAS 19 and Egypt's market condition in order to help assigning the actuarial

assumptions accurately for enhancing the reliability of valuations, ultimately mitigating the risk of inaccuracies.

Steps for Calculating the Defined Benefit Obligations (DBOs)

To account for defined benefit plans, an entity must follow these key steps to ensure proper measurement and recognition of obligations and assets. The process involves estimating the benefits earned by employees, discounting those benefits, and making necessary adjustments for plan assets, actuarial gains or losses, and any changes to the plan. The steps are outlined as follows (SBFRS, 2023):

1. **Estimate the Benefits Earned**:
    - Use actuarial techniques to reliably estimate the benefits employees have earned for their service in the current and prior periods.
    - Determine how much of the benefit is attributable to these periods.
    - Make assumptions about demographic factors (e.g., employee turnover, mortality) and financial factors (e.g., future salary increases, medical costs) that impact the benefit's cost.
2. **Discount the Benefits**:
    - Apply the Projected Unit Credit (PUC) method to calculate the present value of the defined benefit obligation and the current service cost.
3. **Determine the Fair Value of Plan Assets**:
    - Assess the fair value of any assets associated with the plan.
4. **Account for Actuarial Gains and Losses**:
    - Calculate the total actuarial gains and losses and recognize them in Other Comprehensive Income (OCI).
5. **Determine Past Normal (Service) Costs**:
    - If the plan has been introduced or amended, calculate any resulting past service costs.
6. **Account for Curtailments or Settlements**:
    - If the plan has been curtailed or settled, determine the resulting gain or loss.

For entities with more than one defined benefit plan, each material plan must be treated separately in applying these steps.

For a better estimation of the benefits of the employees, it is absolutely necessary to know the most appropriate actuarial assumptions in this field. According to the provisions of the standard and the best practices used, the reporting entity is responsible for selecting assumptions that represent the reporting entity’s best estimates of the variables that will determine the ultimate costs of its employee benefits. The actuary may advise the principal regarding the selection of some or all of the assumptions to be used in the actuarial services. In doing so, the actuary should

be guided by paragraphs 2.6 – 2.9 of ISAP, taking into account IAS 19's requirements regarding assumptions used to measure defined benefit post-employment plans,

The actuarial assumptions fall into two categories (Dănescu, et al., 2019):

- **Financial Assumptions:**

The objective of financial assumptions is to predict the impact of market forces on the plan's cost by using various rates that help estimate the future benefits payable and their present values. The most common financial assumptions include:

i) ***the discount rate*** (see paragraph 83); The discount rate for post-employment benefit obligations, whether funded or unfunded, should be based on the market yields of high-quality corporate bonds at the end of the reporting period. In countries lacking a deep market for these bonds, the market yields on government bonds should be used instead. The currency and duration of the bonds must match the currency and expected term of the post-employment benefit obligations (Mackenzie, et al., 2012).
ii) ***benefit levels***, excluding any cost of the benefits to be met by employees, and future salary (see paragraphs 87–95);
iii) in the case of ***medical benefits***, future medical costs, including claim handling costs (ie the costs that will be incurred in processing and resolving claims, including legal and adjuster's fees) (see paragraphs 96–98); and
iv) ***taxes payable*** by the plan on contributions relating to service before the reporting date or on benefits resulting from that service.

Salaries tend to change over time due to factors like inflation, salary scales, and promotions. Since benefits are often tied to earnings (e.g., final or average salary), it's important to account for future salary increases when distributing the plan's costs. To establish a reliable salary indexation assumption, the actuary should consider entity compensation data (if available), industry benchmarks, current salary practices, and any anticipated changes in the entity's salary policies.

- **Demographic Assumptions:**

Demographic assumptions are about the future characteristics of current and former employees (and their dependents) who are eligible for benefits. Demographic assumptions deal with matters such as:

i) **mortality rates** (see paragraphs 81 and 82);
ii) **rates of employee turnover, disability and early retirement**;
iii) the proportion of plan members with dependents who will be eligible for benefits;

iv) the proportion of plan members who will select each form of payment option available under the plan terms; and

v) ***claim rates*** under medical plans.

The actuary should review information that, in the actuary's professional judgment, is relevant to the population covered by the reporting entity's employee benefits. Such data may include: the experience of the covered population to the extent credible; analyses prepared by experts such as published tables or experience studies; studies or reports on general trends relevant to the particular demographic assumption; the reporting entity's future expectations; and relevant factors known to the actuary that may affect future experience such as the economic conditions of the geographic area or industry, availability of alternative employment, and the reporting entity's human resource policies or practices (Cheng, 2009).

Actuaries typically begin with standard mortality tables to set mortality assumptions and adjust them based on the scheme's specific experience. A common adjustment method is the age offset, where a different age than the member's actual age is used to determine their mortality rate.

According to (Bräuninger, et al., 2014), actuarial calculations are influenced by demographic trends and macroeconomic changes, such as the current high-interest-rate environment. High interest rates increase the discount rate used to update employee benefit obligations, resulting in a lower present value of these obligations. Additionally, demographic shifts like increased life expectancy significantly impact actuarial calculations, as longer lifespans require longer periods of post-employment benefit coverage (Watson, 2015)

Research Methodology

As mentioned earlier, IAS 19 includes four categories of employee benefits, but in this paper, authors will focus only on the defined benefit's post-employee benefit plan taking into account that benefits are given as a lumpsum.

According to IAS19 guidelines for evaluating employee benefit obligations, the Projected Unit Credit (PUC) Method is used. This approach involves determining an entity's obligations for employee benefits by adjusting the value of those obligations and the cost of current services (GUIAHI, et al., 1986).

The Projected Unit Credit (PUC) Method is based on the idea that a member who joins the scheme at entry age (EA) and retires at normal retirement age (NRA) is expected to have N years of service. If the final benefit is known or can be estimated, a fraction of the benefit, equal

to (1/N) of the total retirement benefit, is funded each year of service. This ensures that by the time the member reaches retirement age, the full benefit is completely funded (Angkasa, et al., 2021).

In other words, the present value of the projected benefits is calculated and divided by the estimated total length of service, with a portion of this amount funded each year. Under the PUC method, the benefit is based on the projected salary at the retirement date.

In order to calculate the DBOs, the first step is to set the demographic and financial assumptions. However, actuaries need to explain properly the method and reasoning behind the choice of the assumptions, as well as variations between assumptions chosen and actual experience (Arenas, 2018).

The actuary calculates the expected future benefit payments for each scheme member based on the entity's participant data and plan provisions. These payments account for factors such as the member's earnings, service history, and anticipated decrements like death, withdrawal, disability, or retirement. Each future benefit is then discounted back to the valuation date using actuarial assumptions. If these assumptions are accurate, the entity could, in theory, set aside an appropriate amount of money in a fund, which would be sufficient to cover the scheme's payments, including future service credits and anticipated pay increases.

The following are the notations used to calculate the DBOs as shown below in the following table;

DBOs at the Beginning of the Year
+ Normal Cost (NC)
+ Interest Cost (IC)
+/- Past normal costs
+/- Settlement losses / (gains)
+/- Actuarial losses / (gains)
- Benefit payments
= DBOs at the End of the Year

Table (1): Reconciliation of the Defined Benefit Obligations (DBOs) in the Financial Statements

The explanation for each content in the table is shown below (Clark, et al., 2014);

- ***Normal Cost (NC):*** Is the cost of providing a retirement benefit for an additional year of service.
- ***Interest Cost (NC):*** Is the additional cost added due to the effect of interest.

- ***Accrued Liability (AL):*** Is the present value of the accrued benefit, corresponding to past service, discounted by the interest rate and adjusted by the probability of survival from the valuation age (VA) until Normal Retirement Age (NRA) (other decrements can also apply).
- ***Defined Benefit Obligations (DBOs):*** The actuarial present value of all expected future benefit payments, prorated on past service attributed to the benefit. It is equal to the APV for retired employees and active employees who have completed their attribution period.
- ***Settlement losses/(gains):*** Under paragraphs 109-112, these are transactions that eliminate all future obligations with respect to the benefit plan, other than through the normal terms of the plan. For example, an entity may decide to pay a lump sum payment to retirees in exchange for their rights to the post-benefit retirement plan in the future. To the extent that the settled DBOs was more than the payment required to settle it, a gain is created. For example, if an entity settles a DBO of 10,000 for a price of 7,000, a settlement gain of 3,000 is created. Otherwise, it is a loss.

  The settlement loss/(gain) is measured at the date the event occurs. Therefore, similar to NC, settlements can affect the calculation of the NC, IC and also the amount of expected benefit payments in the portion of the year following the event.

- ***Actuarial losses/(gains) These are changes in the DBOs due to*** (Numerica, 2016) ***:***

  a) Changes in actuarial assumptions, such as updates to the discount rate, mortality tables, or per capita claims cost assumptions, affect the determination of the DBOs.
  b) When actual experience deviates from expectations, such as benefit payments being higher or lower than projected or when census data is updated, it results in actuarial gains (which reduce the DBOs) or actuarial losses (which increase the DBOs). These changes are typically accounted for at the end of the fiscal year or after a significant event like a plan amendment, curtailment, or settlement.

Under IAS 19, actuarial gains and losses are reported in three categories:

- (Gains)/Losses due to demographic assumption changes
- (Gains)/Losses due to financial assumption changes
- (Gains)/Losses due to experience

The DBO, service Cost and Interest Cost are calculated as follows;

$$AL = Accured\ Benefit_{VA} \times v^{NRA-VA} \times {}_{NRA-VA}p_{VA}$$

Where,

- $v \rightarrow$ Is the discounting factor $\frac{1}{1+discount\ rate}$.
- ${}_{NRA-VA}p_{VA} \rightarrow$ represent the probability that an individual aged VA is a live and working at the entity until the NRA (other decrements can also be in force).
- $Accured\ Benefit_{VA} \rightarrow$ is the accrued benefit at the valuation age, considering the portion of benefit that corresponds to past service.

If the benefit is defined as a function of salary and service, then the Accrued Benefit will be calculated as follow:

$$Accured\ Benefit_{VA} = Salary_{NRA} \times N * Service_{NRA} \times \frac{VA - EA}{NRA - EA}$$

$$= DBO_{VA} \times \frac{VA-EA}{NRA-EA}$$

Where,

- $\frac{VA-EA}{NRA-EA} \rightarrow$ represent the ratio between the years of past service until valuation date and the total years of service until retirement age.
- $Salary_{NRA} \rightarrow$ represents the salary projected at NRA.
- $N \rightarrow$ represents the number of months assigned to each year of service.
- $Service_{NRA} \rightarrow$ represents the number of years of services up to NRA.

The Normal Cost (NC) is the increase in the DBO due to service in the current year. It is equal to zero for retired employees and active employees who have completed their attribution period. NC is discounted by the interest rate and adjusted by mortality (other decrements might apply as well). The formula to obtain the NC follows:

$$NC = (Accrued\ Benefit_{VA+1} - Accrued\ Benefit_{VA}) \times v^{NRA-VA} \times {}_{NRA-VA}p_{VA}$$

$$= DBO_{VA} \times \frac{1}{NRA - VA}$$

Where,

- $Accrued\ Benefit_{VA+1} - Accrued\ Benefit_{VA} \rightarrow$ represents the benefit accrued in the present year.

Interest Cost (IC) is the increase in the DBO due to the effect of interest in the passage of time. It is equal to the interest rate at the beginning of the year, multiplied by the expected average benefit obligation over the course of the year.

$$IC_{VA} = Discount\ rate \times (DBO_{VA} + NC_{VA} - 0.5 \times Expected\ benefit\ payments)$$

Note that the formula above assumes that NC is measured at the start of the year and therefore a full year's interest is earned on it. If NC is expressed as an end-of-year value instead, then the interest earned on the NC is included as part of the NC and not the IC, and the formula will be;

$$NC_{VA+1} = NC_{VA} \times (1 + discount\ rate)$$

$$IC_{VA} = discount\ rate \times (DBO_{VA} - 0.5 \times Expected\ benefit\ payments)$$

As the sum of the normal cost and interest cost are equivalent, both approaches are acceptable.

When advising the principal on choosing the discount rate assumption, the actuary should recommend an assumption that aligns with IAS 19's requirement. Specifically, the discount rate should reflect market yields on high-quality corporate or government bonds, as appropriate, at the valuation date. These bonds should match the currency and estimated duration of the employee benefit obligation (ISAP3, 2013).

When advising the principal on selecting the mortality assumption, the actuary should recommend an assumption that reflects plan members' mortality both during and after employment, accounting for anticipated changes in future mortality rates. This can be achieved by using a generational table, which includes separate mortality tables for each birth year. Alternatively, the actuary may use simplified methods, such as projecting mortality rates over a relevant period.

These steps can be summarized in the following figure;

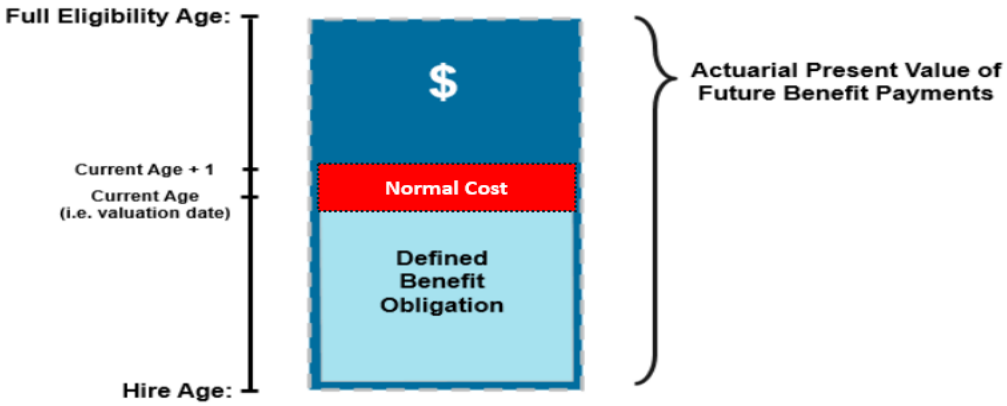

Figure (1): The valuation of the Actuarial Present Value of Future Benefits

Case Study

The initial stage of an actuarial valuation is the data treatment. Data needs to be as accurate as possible and changes in the information's members from one evaluation to the following, need to be explained since it might have an impact on the liabilities.

The results for any valuation of the DBOs cannot be generalized, but a case study for the illustration purpose will be presented in this section.

The data includes the hiring date, birth date, and current salaries for 310 employees, the plan provision has eligibility criteria as one month of benefit for each year of service with a maximum of 150,000 and the minimum years of service of 15 years in case of withdrawal.

The following are the assumptions used in the case study:

1- **Evaluation Date:** December 31, 2022.
2- **Discount Rate:** 18.3% as for the 10 years governmental bonds as of 30/12/2022.
3- **Salary Indexation:** 7% calculated for each member based on historical increase rates.
4- **Mortality Table:** A49/52 ult. and rates has been compared with the actual experience provided for the last 3 years.
5- **Disability Table:** Based on the experience of the social insurance system in the Arab Republic of Egypt.
6- **Withdrawal Rate:** 1.8% at each age until full eligibility is attained according to past experience
7- **Entry Age:** The difference between the entry date and the valuation date.
8- **Valuation Period Basis:** Considered annually.
9- **Valuation Age:** 2023 - Year of Birth.
10- **Normal Retirement Age:** According to the new Social Insurance law in 2019, retirement age is set to increase gradually from 60 to 65 starting from 2032 up to 2040.
11- **Actuarial Method:** Projected Unit Credit Method

Example: DBOs and Normal (Service) Cost for an active employee

The following are the inputs required for calculating the DBOs, NC, and the expected benefits payment:

Date of Birth	(a)	6/25/1975
Entry Date	(b)	2/3/2000
Retirement Date	(c)	6/25/2038
Attained Age	(d)	49
Entry Age	(e)	25
Monthly Salary	(f)	2,895

Valuation Date	(g)	12/31/2022
Total Earned Units	(h)	38
Salary Indexation	(i)	7%
Normal Retirement Age	(j)	63

												Expected Benefit						DBO			
Projected Year	Attained Age	Projected Salary	Earned Units	Benefit in Case of Death	Benefit in Case of Disability	Benefit in Case of Termination	Benefit in Case of Retirement	InForce	Mortality Rate	Disability Rate	Turnover Rate	Death	Disability	Termination	Retirement	PUC Factor	Discount Factor	Death	Disability	Termination	Retirement
2023	49	2,895	24	69,484	69,484	69,484		1.00000	0.00534	0.00160	1.80%	371	111	1,249		1	0.91941	341	102	1,148	
2024	50	3,098	25	77,446	77,446	77,446		0.97522	0.00599	0.00180	1.80%	452	136	1,357		0.96	0.77718	338	101	1,013	
2025	51	3,315	26	86,182	86,182	86,182		0.95025	0.00671	0.00201	1.80%	550	165	1,472		0.923	0.65696	333	100	893	
2026	52	3,547	27	95,761	95,761	95,761		0.92504	0.00750	0.00225	1.80%	664	199	1,592		0.889	0.55533	328	98	786	
2027	53	3,795	28	106,259	106,259	106,259		0.89957	0.00837	0.00251	1.80%	800	240	1,718		0.857	0.46943	322	97	691	
2028	54	4,061	29	117,758	117,758	117,758		0.87381	0.00931	0.00279	1.80%	958	287	1,849		0.828	0.39681	315	94	607	
2029	55	4,345	30	130,346	130,346	130,346		0.84774	0.01035	0.00311	1.80%	1,144	343	1,986		0.8	0.33543	307	92	533	
2030	56	4,649	31	144,119	144,119	144,119		0.82133	0.01148	0.00344	1.80%	1,359	408	2,127		0.774	0.28354	298	89	467	
2031	57	4,974	32	150,000	150,000	150,000		0.79457	0.01272	0.00382	1.80%	1,516	455	2,142		0.75	0.23968	273	82	385	
2032	58	5,323	33	150,000	150,000	150,000		0.76742	0.01408	0.00422	1.80%	1,621	486	2,069		0.727	0.2026	239	72	305	
2033	59	5,695	34	150,000	150,000	150,000		0.73988	0.01557	0.00467	1.80%	1,728	518	1,995		0.706	0.17126	209	63	241	
2034	60	6,094	35	150,000	150,000	150,000		0.71193	0.01720	0.00516	1.80%	1,837	551	1,919		0.686	0.14477	182	55	191	
2035	61	6,520	36	150,000	150,000	150,000		0.68356	0.01899	0.00570	1.80%	1,947	584	1,843		0.667	0.12237	159	48	150	
2036	62	6,977	37	150,000	150,000	150,000		0.65478	0.02096	0.00629	1.80%	2,059	618	1,765		0.649	0.10344	138	41	118	
2037	63	7,465	38				150,000	0.62558							93,836	0.632	0.08744				5,637

Table (2): The projected stream of the accrued liability and the future obligations

Based on the table above, The DBOs is determined by prorating the Accrued Benefits on the proportion of the attribution period that has been completed, which means that the Total DBOs will be classified based on the following table;

DBO Death	**3,781**
DBO Disability	**1,134**
DBO Termination	**7,528**
DBO Retirement	**5,637**

Table (3): The DBOs is classification based on the decrements (death, survival, disability, withdrawal)

The expected benefits payment will be equal to 1,592 which is the expected value in case of death, disability, and withdrawal. These steps will be calculated for each employee of the 310 and the result will be summarized in the following table;

DBOs at the Beginning of the Year	**5,773,704**	
+ Normal Cost (NC)	219,774	P&L component of DBO
+ Interest Cost (IC)	1,029,138	P&L component of DBO
+/- Actuarial losses / (gains) for actual benefit payments being higher / (lower) than expected	(567,367) (Exp: 867,120; Actual: 299,753)	OCI component of DBO
- Benefit payments	(620,175)	
= DBO at the End of the Year	**5,835,074**	

Table (4): The reconciliation of the DBOs during the valuation period

Therefore, the balance sheet position at the end of the year is a liability of **6,402,441**; and the defined benefit cost for the year is an expenses item of **681,545**; comprised of:

- P&L charge of **1,248,912**; the sum of NC and IC.
- OCI credit of **567,367;** the sum of all the actuarial losses / (gains)

  - Note that for the expected benefits payment, the retirement benefits are assumed to be paid at the beginning of the year, where death disability, and withdrawal assumed to be paid during the year and distributed uniformly.
  - For the IC, the benefits payments for the decrements other than retirement is included in the NC.

It is very important to assess the sensitivity of the valuation to changes in key assumptions. The approach to follow is recalculating the liabilities with a change in a key assumption while the other assumptions remain unchanged. Liabilities should decrease when using higher discount rates and should increase with the increase in expected salary, pension growth and improvement in mortality.

In summary, the actuarial valuation process relies heavily on accurate data treatment and well-defined assumptions to ensure a realistic estimation of the Defined Benefit Obligations (DBOs). The case study provided illustrates how various actuarial factors, such as discount rates, salary indexation, and mortality tables, influence the DBO calculation. Using the Projected Unit Credit Method, the accrued liabilities are prorated based on the completed portion of the attribution period. The reconciliation of the DBO over the valuation period highlights key components such as normal cost, interest cost, and benefit payments. While actuarial gains or losses were not included in this example, their presence would typically impact future valuations. This approach ensures that each employee's obligations are fairly accounted for, providing a transparent and structured method for determining defined benefits liabilities.

Conclusions and Recommendations

IAS 19 plays a crucial role in ensuring transparency and consistency in accounting for employee benefits, particularly in defined benefit plans. The use of actuarial rules, especially the Projected Unit Credit (PUC) method, is vital for accurately calculating the present value of future obligations. By incorporating actuarial gains and losses through Other Comprehensive Income (OCI), the standard allows organizations to manage the financial effects of long-term employee benefits, thus reducing volatility in the income statement.

However, applying IAS 19 in Egypt presents distinct challenges, including economic volatility, a shortage of actuarial expertise, and underdeveloped financial markets. In this context, it is essential to carefully consider the discount rates, actuarial assumptions, and mortality data used in calculating defined benefit obligations. While Egypt's regulatory framework is gradually aligning with international standards, substantial development is still needed for practical implementation. As the economy grows and financial markets mature, the accurate application of IAS 19 will be essential for enhancing transparency and reliability in corporate financial reporting.

The literature on IAS 19 emphasizes its significant influence on how organizations account for employee benefits, particularly defined benefit plans. Although the standard has improved transparency and comparability in financial reporting, the complexities of actuarial assumptions and the treatment of remeasurements remain contentious issues where the actuary's role will be mandatory to increase the accuracy of the calculations.

To enhance the implementation of IAS 19 in Egypt, it is recommended to promote future research and local adaptations of the standard while investing in training and developing local actuarial talent to improve the accuracy of defined benefit obligation calculations. Organizations should carefully evaluate the assumptions underlying these obligations to ensure accurate representation of pension liabilities. Collaborating with international actuarial firms can provide valuable expertise and best practices, while continuously assessing and adapting the regulatory framework will help align it with international standards. Additionally, conducting further research on actuarial assumptions and remeasurement treatments will be essential to maintain the relevance of IAS 19 in an evolving pension landscape.

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المستخلص

يواجه تطبيق معيار المحاسبة الدولي 19(IAS 19) ، الذي ينظم المحاسبة والإبلاغ عن مزايا العاملين عدة تحديات في مصر، تعكس قضايا أوسع تواجهها الأسواق الناشئة، حيث يفرض معيار IAS 19 على الجهات التنظيمية والشركات الاعتراف بالالتزامات المتعلقة بمزايا العاملين، مثل المعاشات والمزايا الأخرى بعد انتهاء الخدمة، مع تقديم إفصاحات تفصيلية حول كيفية قياس هذه الالتزامات وإدارتها. ومع ذلك، تواجه عملية التكيف في مصر عقبات فريدة، بما في ذلك نقص البيانات الاكتوارية الشاملة، والافتقار إلى الخبرة المحلية في تطبيقا المعيار، والاختلافات بين المعايير الدولية والممارسات المحاسبية التقليدية في مصر.

تتمثل إحدى التحديات الكبيرة في مواءمة المتطلبات التنظيمية المحلية مع أحكام معيار IAS 19، حيث يتعين على الكيانات المصرية الانتقال من الأساليب التقليدية في الإفصاح عن مزايا العاملين إلى الأساليب التي تتطلب التقييمات الاكتوارية والافتراضات المتعلقة بمعدلات الخصم، والتضخم، ومتوسط العمر المتوقع، والتي تؤثر جميعها على التزامات المزايا، ويتطلب هذا التحول معرفة متخصصة لا تزال في طور النمو داخل القطاعين المالي والاكتواري. علاوة على ذلك، فإن التقلبات الاقتصادية والضغوط التضخمية في مصر تعقد الافتراضات اللازمة بموجب معيار IAS 19 ، مما يجعل من الصعب على الكيانات تقديم توقعات دقيقة وطويلة الأجل.

علماً أن المعيار قد عزز الشفافية وقابلية المقارنة في التقارير المالية، إلا أن التعقيدات المتعلقة بالافتراضات الاكتوارية ومعالجة إعادة القياس لا تزال تشكل تحدياً كبيراً. وبذلك، يصبح دور الخبير الاكتواري ضروريًا لضمان دقة وموثوقية الحسابات، مما يعزز من تطبيق معيار IAS 19 بشكل أكثر فاعلية في حساب المخصصات اللازم الإفصاح عنها فيما يخص مزايا العاملين.

الكلمات الدالة

الافتراضات الاكتوارية، التزام المزايا المحددة، معيار المحاسبة الدولي 19، تكلفة الخدمة، تكلفة الفائدة، المزايا المستحقة، نظام المزايا المحددة، نظام الاشتراكات المحددة