

Projected Unit Credit Method



AABE

Accounting and Audit Board of Ethiopia
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The background of the slide is a solid green color with a complex, low-poly geometric pattern. The pattern consists of numerous irregular polygons of varying sizes and shades of green, creating a textured, crystalline appearance. The text is centered horizontally and vertically on the slide.

Severance pay



Legal requirements

Right to Receive

Right to receive severance pay at termination of employment 39(1):

All employees	Employees employed for 5+ years
a) Cessation of operations	h) Sickness or death, or
b) Termination in violation of law	departure otherwise on own
c) Attainment of retirement age (and no other pension)	initiative
d, e and f) Unsafe work environment	
g) Partial or complete disability	
i) HIV/AIDs	



Legal requirements

Amount of pay

Paragraph 40(1) and 40(2) establish the base amount:

- » 30 x average daily wage for last week of employment for the first year of service
- » proportional if employment period less than one year

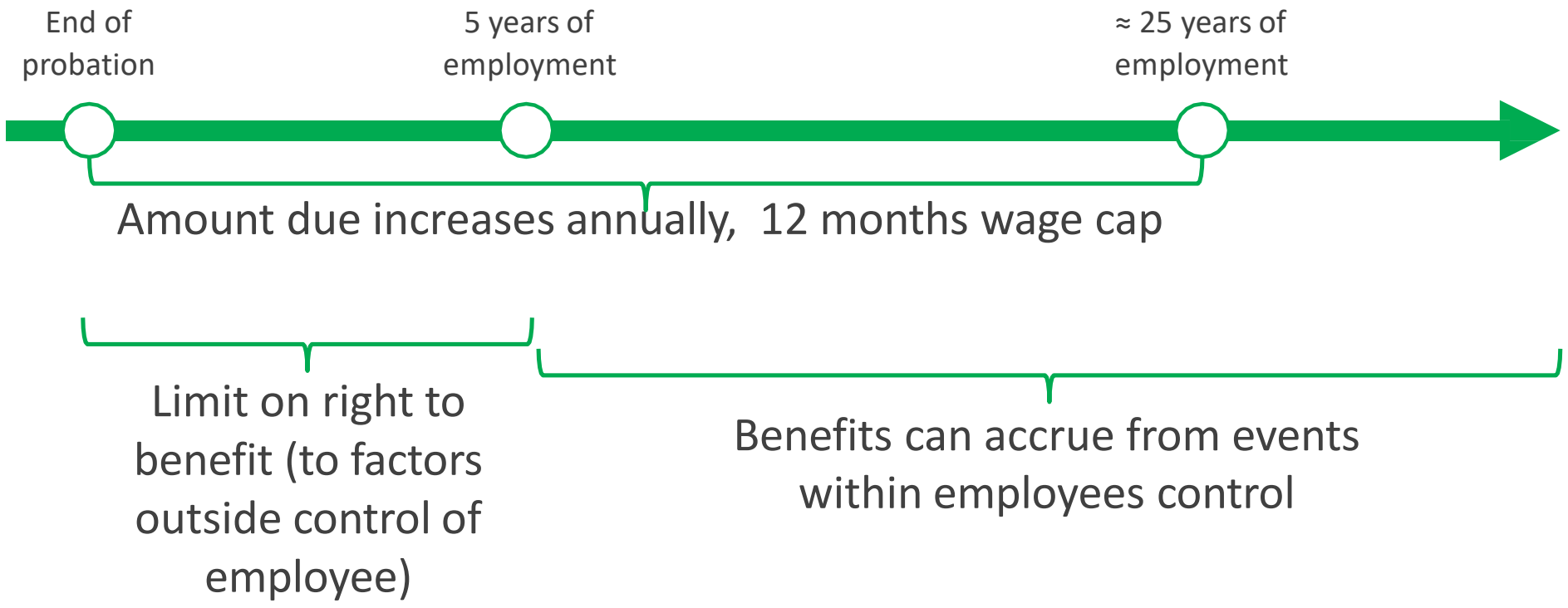
Paragraph 40(3) increases base amount by

- » 1 third of base amount for every additional year of service
- » Up to a maximum of 12 months wages



Legal requirements

Amount of pay





Measurement of long term employee benefits (IAS 19)

- » Accumulate liability over time as employee provides service
- » Using an actuarial technique that estimates the ultimate cost to the entity in return for service in current and past periods
- » Discounted to reflect time value of money (between balance sheet date and expected ultimate payment date), and
- » Adjusted in each period for:
 - » Changes to previous estimates
 - » Changes in discount rate and
 - » Unwind of time value of money



Projected Unit Credit Method – Case 1

Facts

Benefit: Lumpsum Benefit Payable on termination of service equal to 1% of final salary for each year of service.

Salary in Year 1 is Birr 10,000 and is assumed to increase at 7% compounded for each year.

Discount Rate: 10% per year and is assumed to be constant

Employee Certain to Leave at the end of 5 years



Projected Unit Credit Method – Case 1

	Birr				
Year	1	2	3	4	5
Salary	10,000	10,700	11,449	12,250	13,108
Benefit Attributed:					
Prior Years	-				
Current Year	131	131	131	131	131
Gross Benefit:					
Opening Obligation	-	90	197	325	477
Interest at 10%	-	9	20	32	48
Current Service Cost	90	98	108	119	131
Closing Obligation	90	197	325	477	655



Projected Unit Credit Method – Case 1

Benefit Attributed	131				
Benefit: Lumpsum Benefit Payable on termination of service equal to 1% of final salary for each year of service.					
So 1% of 13,108					
Current Service Cost	90				
PV of the Benefit Payable in 5 Years					
PV of 131 discounted at 10% for 4 years					
Interest Cost	10%				
Unwinding of the Closing Obligation over time					
Year 1 = 90 * 10% = 9					
Year 2 = 197 * 10% = 20					



Projected Unit Credit Method – Case 1

		Dr	Cr		Cummulative Pension Liability
Year 1	Pension Cost	90			
	Pension Liability		90		90
Year 2	Pension Cost	107			
	Pension Liability		107		197
Year 3	Pension Cost	128			
	Pension Liability		128		325
Year 4	Pension Cost	152			
	Pension Liability		152		477
Year 5	Pension Cost	179			
	Pension Liability		179		655



Projected Unit Credit Method – Case 2

Facts					
Benefit: Lumpsum Benefit Payable on termination of service equal to 1% of final salary for each year of service.					
Salary in Year 1 is Birr 10,000 and is assumed to increase at 7% compounded for each year.					
Discount Rate: 10% per year and is assumed to be constant					
Probability of Employee being in Employment at the end of 5 years is 0.75					



Projected Unit Credit Method – Case 2

Probability of Retention	75%					
	Birr					
Year	1	2	3	4	5	Year 5 Expected Value
Salary	10,000	10,700	11,449	12,250	13,108	9,831
Benefit Attributed:						
Prior Years	-	98	197	295	393	
Currert Year	98	98	98	98	98	
	98	197	295	393	492	
Gross Benefit:						
Opening Obligation	-	67	148	244	357	
Interest at 10%	-	7	15	24	36	
Current Service Cost	67	74	81	89	98	
Closing Obligation	67	148	244	357	492	



Projected Unit Credit Method – Case 2

		Dr	Cr		Cummulative Pension Liability
Year 1	Pension Cost	67			
	Pension Liability		67		67
Year 2	Pension Cost	81			
	Pension Liability		81		148
Year 3	Pension Cost	96			
	Pension Liability		96		244
Year 4	Pension Cost	114			
	Pension Liability		114		357
Year 5	Pension Cost	134			
	Pension Liability		134		492



Projected Unit Credit Method – Computation

Incorporation of Actuarial Assumptions:


- Probability of Turnover or Probability of Retention?
- Mortality – computation – am I double counting?



Projected Unit Credit Method – Probability

Frequency interpretation: "Probabilities are understood as mathematically convenient approximations to long run relative frequencies."

Subjective interpretation: "A probability statement expresses the opinion of some individual regarding how certain an event is to occur."



Projected Unit Credit Method – Pay out conditions

1. Payout on both resignation **and** death while in service.
2. Payout only on resignation and not on death while in service.



Projected Unit Credit Method – Pay out on both resignation and death

Given two events, A and B, to “find the probability of A or B” means to find the probability that **either event A or event B occurs**.

So if payout is on either resignation or death then we have to consider the following:

$P(A) + P(B)$ assuming mutually exclusive events.

Here we simply add the two probabilities.



Projected Unit Credit Method – Payout only on resignation while in service.

- Probability of Event (A) – probability of withdrawing from service
- Probability of Event (B) – probability of being alive given a certain age group (1- Mortality percentage)
- What I need is the probability of Event A given that Event B has happened – the probability of someone withdrawing from service given that they are alive

Very different from

- Someone withdrawing from service due to mortality **which does not lead to a payout.**
- This is a conditional probability – $P(A|B)$ and bit more involved to calculate
- $P(A|B) = P(A \text{ and } B) / P(B)$
- Where $P(A \text{ and } B) = P(A) \times P(B)$ assuming these events are independent.



Projected Unit Credit Method – Probabilities (contd.)

- What I am trying to do is compute **conditional probabilities**
- This is a bit more involved.
- We have to use Bayes Theorem:

$$P(A|B) = P(A \text{ and } B) / P(B)$$

- So how do we compute $P(A \text{ and } B)$?

$$P(A \text{ and } B) = P(A) \times P(B) \text{ assuming these events are independent.}$$

- This can only be tested using the data but we can start with this assumption – but will need testing over time.
- So now the conditional probability of the event can be calculated
- And more critically the conditional expectation of pay out due to with drawl.
- What is the result of this assumption?



Projected Unit Credit Method – Probabilities (contd.)

- Because I have assumed them to be independent i.e. they do not impact each other I am actually ignoring the mortality rate.
- This defeats the purpose of having a mortality rate.
- This is where actuaries come in and determine actually whether or not the events are actually independent.



Projected Unit Credit Method – Actuarial Assumptions

Usually two elements used:

- Retention Rate and
- Mortality Rate.

One approach that might be easier is to determine the combined probability of payout as a single number based on past data.

For each cohort of employees what is the probability based on past data of having to make payment.

Simplified – say out of every 100 employees I have to pay out for 15 employees. I don't have to pay out for 85 due to resignations and sickness/death. I do not try to break up the probabilities but do it as a single estimate.

I would recommend we do this by age band as this number seems to be driven by the age of the person.



Projected Unit Credit Method – Actuarial Assumptions

The proposal is an approximation and as resources and skill sets develop in the jurisdiction we should move to more accurate computations.

Different growth salary growth rates for different levels of employees.

More accurate determination of retention probabilities based on age, seniority, years of service etc.

Incorporate mortality computations separately.



Projected Unit Credit Method – Salary Growth Rate

This is a forward looking estimate.

By definition it will NOT be accurate.

Will need to be updated as circumstances change.

Key Questions:

- How did I derive this number?
- What is the industry expectation?
- Does it apply uniformly to all staff?
- Is there a consensus view amongst industry members?
- Is this assumption consistent with other business plans prepared by the entity?



Projected Unit Credit Method – Discount Rate - Example

IFRS Requirements:

- Can use the same rate over the entire tenure;
- Use a high quality corporate bond rate;
- If not available use the Government bond rate.



Projected Unit Credit Method – Discount Rate

Discount rate

IAS 19 requires that the discount rate used in the valuations be determined by reference to market yields on high quality corporate bonds as at the balance sheet date.

In countries where there is no deep market in corporate bonds, government bonds should be used. It is currently market practice to use government bond yields, as the Ethiopian corporate bond market is not considered to be sufficiently developed. Due to insufficient data on Ethiopian government bonds, we have adjusted the spot rate on Ethiopian bonds using the term structure of interest rates in Kenya to develop the term structure of interest rates for Ethiopia. The decision to use Kenya was informed by the historical significant correlation between Kenya and Ethiopia's interest rates.

We estimated the duration of the liabilities to be 3.62 years



Projected Unit Credit Method – Discount Rate

IFRIC JUNE 2017

- a. an entity with post-employment benefit obligations denominated in a particular currency assesses the depth of the market in high quality corporate *bonds denominated in that currency*. This means that the entity does not limit this assessment to the market or country in which it operates, but also considers other markets or countries in which *high quality corporate bonds denominated in that currency* are issued.
- b. if there is a deep market in high quality corporate bonds denominated in that currency, the entity determines the discount rate by reference to market yields on high quality corporate bonds at the end of the reporting period. It does *so even if there is no deep market in such bonds in the market or country in which the entity operates. In this situation, the entity does **not** use market yields on government bonds to determine the discount rate.*
- c. if there is no deep market in high quality corporate bonds denominated in that currency, the entity determines the discount rate using market yields on government bonds denominated in that currency.
- d. the entity applies judgement to determine the appropriate population of high quality corporate bonds or government bonds to reference when determining the discount rate. The *currency and term of the bonds should be consistent with the currency and estimated term of the post-employment benefit obligations.*



Projected Unit Credit Method – Discount Rate

- Focus is on matching currency and tenure.
- Silent on whether it should be of similar credit risk of the country in question.
- People will generally match currency (required) and credit rating.



Questions