

## 6.4 Summary

 5m

### The Bornhuetter-Ferguson (BF) Method

The BF method is a blend of the development technique together with the expected claims technique.

To determine the reserve using the BF technique:

1. Estimate ultimate losses using the expected claims method.
2. Calculate the cumulative loss development factors (CDF) using the development method.
3. Estimate ultimate losses using (6.4.1.1) or (6.4.1.2).
4. To estimate the IBNR, subtract actual reported losses; to estimate the unpaid claims, subtract actual paid claims.

The BF method can also be viewed as a **credibility-weighted average** between the development estimate and the expected claim ratio estimate.

- Overall advantages include:
  - Works well for long tails and for limited data
  - Withstands early random fluctuations in AYs
  - More accurate than the reported development technique when faced with large and unusual claims

### The Benktander Method

The Benktander method combines the BF technique and the development technique in a credibility-weighted average.

Additional key facts are:

- Essentially an iterative version of the BF technique that will eventually converge to the development method's ultimate claims estimate.
- Places more weight on the development technique, making it more responsive to the changes in the claims data than the BF method, but results in more stable estimates than the

development technique.

## Analyzing the BF and Benktander Methods

When changes occur in the book of business, the BF and Benktander methods, as weighted averages of the development and expected claims methods, adopt the traits of those methods.

Description	Impact on BF & Benktander Methods	
	Paid	Reported
<b>Increase in claim ratios</b>	Underestimates ultimate claims if the increase is not captured by the ECR, though not by as much as the EC method would.	
<b>Increase in case outstanding adequacy</b>	No effect	Overestimates ultimate claims by less than the development method but more than the EC method.
<b>Changes in product mix</b>	Can be distorted when the changing lines of business have varying development patterns or ECRs.	