6.3.2 Analyzing the Expected Claims Method   🕐 **10m**

The EC method provides very stable estimates at the expense of being less responsive to recent claims experience. This is because it does not directly incorporate recent claims experience in determining the ECR. Even if a procedure that utilizes historical data is relied upon when determining the ECR, the actuary ultimately has the final decision and can exercise their actuarial judgement to select a different ECR if they see fit. Keep this in mind as we discuss each of the considerations below.

Changes in Claim Ratios

The EC method is **not responsive** to changes in claim frequency, severity, or overall claims ratios that occur during the estimation year. This is a key limitation. If something unusual happens—like a spike in large claims or a drop in frequency—the EC method will miss it because the ECR is not based on historical data.

If claim ratios **increase** in the current year:

- For example, severity may rise due to inflation or more expensive claims.
- The ECR, which is independent from the data, doesn't capture the increase.
- **Result**: The EC method will **underestimate** ultimate claims.

If claim ratios **decrease** in the current year:

- For example, frequency may fall due to improved underwriting or other favorable trends.
- The ECR does not adjust for this change and will remain too high.
- **Result**: The EC method to **overestimate** ultimate claims.

In both cases, the ECR becomes "out of sync" with the actual claims experience. This occurs because the EC method inherently relies on the actuary's ability to come up with a reasonable ECR. If a reasonable ECR is determined, but then a change in claim frequency or severity causes the ECR to become no longer reasonable, applying the ECR without adjusting for the change would produce a similarly unreasonable estimate of ultimate claims.

However, if a change in frequency or severity occurred in one of the years **before the ECR was determined**, we could assume that the actuary who determined the ECR would have had access to that information. Thus, they would have been able to correctly adjust for the change, allowing them to derived a ECR for the current accident year.

Changes in Case Outstanding Adequacy

Similar to changes in claim ratios, the ultimate claim estimates produced by the EC method are **not affected** by changes in the strength of case outstanding. In this scenario, that's actually an advantage.

An increase or decrease in the adequacy of case outstanding for a given accident year doesn't necessarily imply a change in the actual ultimate claims for that year; it simply reflects a change in how conservatively the company is setting its reserves.

Because of this, the EC method is appropriate for estimating ultimate claims in situations where the adequacy of case outstanding has changed.

Changes in Product Mix

When using the EC method to estimate reserves, changes in product mix can affect the accuracy of the ECR, especially when different lines of business have significantly different ECRs.

If the mix of business shifts (e.g., the company starts writing more of a product with a higher or lower ECR), the overall ECR for the combined book will also change. This has the same effect on the EC method as a change in the claim ratio.

To address this, the EC method can be adjusted by calculating a **weighted average ECR**, rather than basing the ECR off of the combined data from all lines. This involves weighting each line's ECR by its share of earned premium. Doing so ensures that the final ECR accurately reflects the current composition of the business, leading to a more accurate estimate of ultimate claims.

We will demonstrate how to calculate a combined ECR using a simple example. Notice the similarities between this example and the one given in Section 6.2.2.

Claims data is given for two different product lines below as of 12/31/2021.

Year	Line	AY Earned Premium	ECR
2020	A	$500	0.65
2020	B	$1,000	0.58
2021	A	$700	0.65
2021	B	$800	0.58

Rather than estimating the ultimate claims for each product line individually, the insurer combines the two lines and makes a single ultimate claims estimate.

There have been no rate changes in 2020 or 2021, and no trend for either premium or losses.

Notice that the earned premium for Line A makes up a much larger portion of the total book of business in 2021 than in 2020. Since there have been no rate changes, this indicates that the insurer's mix of business has changed. And since Line A and Line B do not have the same ECR, the ECR for the combined line is different between the two years.

In 2020,

$$\mathrm{ECR}_{2020} = \frac{500(0.65) + 1{,}000(0.58)}{500 + 1{,}000} \approx 0.6033$$

and in 2021,

$$\mathrm{ECR}_{2021} = \frac{700(0.65) + 800(0.58)}{700 + 800} \approx 0.6127$$

As you can see, the EC method implicitly ignores all environmental changes, which makes it a suitable choice in unstable environments where other methods may be distorted.

However, there's an important exception: if the claim ratio has shifted in recent years and that data hasn't yet been incorporated into the ECR calculation, the ECR estimate may be unreliable. Because the ECR is determined separately, it doesn't reflect recent shifts in the underlying claim ratio. In such cases, the EC method may not be appropriate for estimating ultimate claims.