1.3.2 → Aggregating data

→ Overview → there are three general goals of data aggregation:

1) Accurately match losses & premium for a policy

2) Use the most recent data available

3) Minimize the cost associated w/ gathering & retrieving data

→ There are 4 common methods of data aggregation: calendar year, accident year, policy year, & report year. Each method differs in how well it achieves the goals listed above. While the methods will be discussed in terms of annual accounting periods, it is possible to aggregate the data based on other intervals, such as monthly or quarterly.

→ Except for calendar year aggregation, an annual period does not have to follow the traditional calendar year (ie Jan 1 – Dec 31). Companies may choose to coincide an annual period w/ their fiscal year.

→ Calendar year aggregation

→ Calendar year aggregation groups data according to the calendar year. For example, CY 2020 earned exposures are all exposures earned between Jan 1, 2020 & Dec 31, 2020, regardless of when the policies were issued. Similarly, CY paid losses include all losses paid during the 12-month CY, regardless of the accident dates or report dates

→ Advantages → data is readily available once the CY ends

→ There is no future development, as the values for premiums, exposures & losses are fixed at the end of the CY

→ Data is easily accessible at no additional cost, as most insurers conduct financial reporting on a CY basis

→ Disadvantages → → mismatch between premium & losses)

→ Premium earned during the CY comes from policies in force during the CY, which could have been written in the previous CY or the current CY

→ losses may include payments & reserve changes on claims from policies issued a year ago

→ Inability to capture major developments due to the fixed nature of data

→ CY aggregation is most suitable for lines of businesses or coverages where the losses are reported & settled relatively quickly such as homeowners insurance.

→ Accident Year aggregation

→ Accident year aggregation of losses groups losses according to the accident date For example, AY 2020 reported losses include loss payments & case reserves for claims that occurred in 2020, regardless of the policy issuance dates or the report dates. Losses can & often do change after the accident year ended due to additional claim reports, loss payments, & reserve changes.

→ AY aggregation of premium & exposures is nearly the same as CY premium & exposures. Thus, this method is often referred to as calendar-accident year or fiscal-accident year.

→ The one exception to this is for lines of business that perform premium audits. AY aggregation allows for premiums to be audited after the end of the policy period, whereas CY aggregation typically doesn't.

→ Advantages → Easy to achieve & easy to understand

→ Better match of premiums & losses than CY aggregation, as losses paid for claims that occurred during the year are compared to premium earned during the same year

→ Useful for identifying the impact of major claim events (e.g. a catastrophe) or changes due to economic or regulatory forces (e.g. inflation & law amendments) on claims experience

→ Disadvantages → requires estimation of future development to known losses that are not closed at the end of the year

→ Provides a less accurate evaluation of premiums & losses

→ Policy Year Aggregation

→ Policy year aggregation, aka underwriting year aggregation, groups data according to the year in which the policies were written. Policy year earned premium & exposures include all premium & exposures earned from policies written during the year, regardless of when any claim was reported, or paid. Premium & exposures are not fixed until all the policies written during the year have expired. Losses can & often do change after the policy year has ended due to additional claims reports, loss payments, & reserve changes

→ Advantages → provides the best match between losses & premiums

→ useful for identifying the impacts of underwriting or pricing changes

→ Disadvantage → development on IBNR claims is excluded

→ Report year aggregation

→ Report year aggregation groups groups data according to when each claim was reported. This method is typically used for claims-made policies, whereas coverages depend on the report date of the claims.

→ Advantage → provides more stable data than AY aggregation, as the # of claims is fixed at the end of the year

→ Disadvantage → Development on IBNR claims is excluded

→ Example → When aggregating data for ratemaking purposes two of the three general objectives are:

→ To accurately match losses & premiums for the policy

→ To use the most recent data available

Briefly discuss how well the following methods of data aggregation achieve these two general objectives

→ a) CY → Data is grouped by the date of transactions, ignoring the policy issuance date, accident date, or claim report date

→ It achieves the best accurate alignment between premiums & losses, as losses from policies issued in one calendar year may be linked to premiums from another

→ The advantage is that it uses very recent data, since both premiums & losses are finalized once the CY ends

→ b) Calendar/accident year

→ Premium is aggregated by transaction date, while losses are based on accident date

→ This method improves premium & loss matching compared to CY approach, as losses from claims during the year are compared to premiums earned in the same year. However, there remains some mismatch

→ The data is not finalized at the end of the AY since losses may still develop, so it doesn't use the most recent data like the CY method

→ c) policy year (PY)

→ Data is grouped by the year in which the policies are issued, encompassing both premiums & losses for both policies

→ This provides an ideal match between premiums & losses, as data relate to policies written in the same year

→ However, it takes a long time for premiums & losses to fully develop, making it less responsive & not as up-to-date as CY or AY data