

## A Short Guide to Selecting Trend Dates for Premium Trends and Loss Trends

*A Study Aid for Casualty Actuarial Society (CAS) Exam 5 – by G. Stolyarov II*

<b>FOR EARNED PREMIUM DATA</b>		
<u>TYPE OF DATE</u>	<u>METHOD OF DATA AGGREGATION</u>	
	Calendar Year	Policy Year
Average written date	Midpoint of period – (1/2) of policy term	Midpoint of period
Average earned date	Midpoint of period	Midpoint of period + (1/2) of policy term
<u>Premium trend</u> , trend-from date (Average written date)	Midpoint of period – (1/2) of policy term	Midpoint of period
<u>Premium trend</u> , trend-to date (Average written date)	May not use calendar year; must use policy year	Midpoint of period

<b>FOR WRITTEN PREMIUM DATA</b>		
<u>TYPE OF DATE</u>	<u>METHOD OF DATA AGGREGATION</u>	
	Calendar Year	Policy Year
Average written date	Midpoint of period	Midpoint of period
Average earned date	Midpoint of period	Midpoint of period + (1/2) of policy term
<u>Premium trend</u> , trend-from date (Average written date)	Midpoint of period	Midpoint of period
<u>Premium trend</u> , trend-to date (Average written date)	May not use calendar year; must use policy year	Midpoint of period

<b>FOR LOSS DATA</b>		
<u>TYPE OF DATE</u>	<u>METHOD OF DATA AGGREGATION</u>	
	Calendar Year / Accident Year	Policy Year
Average loss occurrence date If premium is earned premium	Midpoint of period	Midpoint of period + (1/2) of policy term
Average loss occurrence date If premium is written premium	Midpoint of period + (1/2) of policy term	Midpoint of period + (1/2) of policy term
<u>Loss trend</u> , trend-from date If premium is earned premium (Average loss occurrence date)	Midpoint of period	Midpoint of period + (1/2) of policy term
<u>Loss trend</u> , trend-from date If premium is written premium (Average loss occurrence date)	Midpoint of period + (1/2) of policy term	Midpoint of period + (1/2) of policy term
<u>Loss trend</u> , trend-to date (Average loss occurrence date)	May not use calendar/accident year; must use policy year	Midpoint of period + (1/2) of policy term

For extensive exam practice, see The Actuary's Free Study Guide for Exam 5:

<http://rationalargumentator.com/actuaryguide/5-study-guide.html>

### **Memory and Classification Aid**

To assist in memorizing the above selection standards, I have developed a naming convention for each situation described in the tables above. The naming convention for each situation is a string of four two-letter terms, each denoting a particular condition.

#### **Question 1. Are we determining premium trend or loss trend?**

Premium Trend → First entry is PT.

Loss Trend → First entry is LT.

#### **Question 2. Are the underlying data earned premium data or written premium data?**

Earned premium data → Second entry is EP.

Written premium data → Second entry is WP.

#### **Question 3. Is the method of aggregation calendar year (including the possibility of accident year aggregation for losses) or policy year?**

Calendar or accident year → Third entry is CY.

Policy year → Third entry is PY.

#### **Question 4. Are we determining a trend-from date or a trend-to date?**

Trend-from date → Fourth entry is TF.

Trend-to date → Fourth entry is TT.

### **Three Options for the Answer**

There are three possibilities for what the relevant date might be. We define them as follows:

Midpoint of period – (1/2) of policy term = M-

Midpoint of period = M

Midpoint of period + (1/2) of policy term = M+

#### **For legitimate letter strings:**

**M-:** PT EP CY TF <sup>1</sup>

**M:** All PT WP, all PT EP PY, LT EP CY TF <sup>2</sup>

**M+:** All LT WP, all LT EP PY, LT EP CY TT. <sup>3</sup>

**Illegitimate letter strings:** Any letter strings ending with CY TT.

(Calendar year aggregation may not be used with a trend-to date.)

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<sup>1</sup> Note that PT EP CY TF is the *only* M- situation. Memorize the letter string, and you will be prepared to address this possibility.

<sup>2</sup> Note that LT EP CY TF is the *only* M situation for LT. Memorize the letter string, and you will be prepared to address this possibility.

<sup>3</sup> Note that all the M+ situations refer to loss trends. The only LT that is not in the M+ category is LT EP CY TF.

**Example.** All policies have annual terms. The historical experience period is Calendar Year (CY) 2012, and earned premium is being used. New rates will be effective July 1, 2014 and will be in effect for 1 year.

- a. What is the *premium trend-from date*?
- b. What is the *premium trend-to date*?
- c. What is the *loss trend-from date*?
- d. What is the *loss trend-to date*?

**Answers to Example.**

- a. The premium trend-from date is the average written date of CY 2012, or the start of 2012:  
**January 1, 2012.**
- b. The premium trend-to date is the average written date of the *policy year* starting July 1, 2014. This is the midpoint of such a policy year, i.e., **January 1, 2015.**
- c. The loss trend-from date is the average loss occurrence date of CY 2012, or the midpoint of 2012:  
**July 1, 2012.**
- d. The loss trend-to date is the average loss occurrence date of the *policy year* starting July 1, 2014 – the end of such a policy year (i.e., the day on which policies for that policy year are no longer written):  
**July 1, 2015.**

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