12. (1.75 points)

Given the following information:

		State A		Countrywide	
Vehicle Type	Vehicle Use	Exposures	Losses ($)	Exposures	Losses ($)
Car	Pleasure	2,500	500,000	30,000	6,600,000
Car	Work	1,000	500,000	25,000	16,250,000
Truck	Pleasure	0	0	40,000	14,400,000
Truck	Work	3,000	300,000	50,000	8,500,000

- An actuary is developing a pure premium estimate for trucks used for work in state A.
- The actuary is using experience from all other states as a complement of credibility.

a. (1.25 points)

Calculate the complement of credibility using Harwayne's Method.

b. (0.5 point)

Briefly describe two advantages of using the current rate as a complement of credibility instead of calculating the complement with Harwayne's method.

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QUESTION 12

TOTAL POINT VALUE: 1.75 | **LEARNING OBJECTIVE(S): A8**

SAMPLE ANSWERS

Part a: 1.25 points

Sample 1

Assume "All Other States" means the complement uses other states, not including State A.

Calculation for "All Other States":

	Exposure	Losses	Pure Premium
Car (Pleasure)	(30,000 – 2,500) = 27,500	(6,600,000 – 500,000) = 6,100,000	$221.82
Car (Work)	24,000	15,750,000	$656.25
Truck (Pleasure)	40,000	14,400,000	$360.00
Truck (Work)	47,000	8,200,000	$174.47

Calculate "All Other" pure premium with State A exposures:

$$\frac{\$221.82 \times 2500 + \$656.25 \times 1000 + \$360 \times 0 + \$174.47 \times 3000}{2500 + 1000 + 3000} = \$266.80$$

Calculate State A Pure Premium:

$$\frac{(\$500{,}000/2500)*2500 + (\$500{,}000/1000)*1000 + (\$300{,}000/3000)*3000}{2500 + 1000 + 3000 + 0} = \$200.00$$

Adjustment Factor = $200.00 / $266.80 = 0.7496

"Other States" Adj. Truck (Work) Pure Premium = Complement = 0.7496 x $174.47 = $130.78

Part b: 0.5 point

Sample Responses for Advantage 1

- The current rate is much easier to calculate then doing Harwayne's method.
- Using the current rate is easier to calculate as it involves simple trending which is an advantage over Harwayne's method.
- Using Current Rate is much easier to calculate than Harwayne's method, so it saves time.
- Harwayne's method is more difficult to compute.
- No calculation needed for current rate.

Sample Responses for Advantage 2

- The current rate has a more direct logical relationship to the base rate than Harwayne's method, so it is easier to explain and present.
- Since the current rate is easier to calculate, it is easier to explain the logical relationship to the subject experience, which is another advantage.
- Harwayne's method doesn't have an easy logical (or simple) relationship to the subject, which can make it hard to explain.

EXAMINER'S REPORT

Candidates were expected to understand and correctly apply Harwayne's Method to determine a complement of credibility for given data.

Part a

Candidates were expected to use the given table of data and calculate all the necessary steps of the Harwayne's Method to determine the complement of credibility to be used for Work Trucks.

Common mistakes included:

- Not subtracting State A exposures and losses from the Countrywide data before calculating the Countrywide Pure Premiums.
- Not weighting the individual Countrywide Pure Premiums (i.e. Car/Work, Car/Pleasure, Truck/Work, Truck/Pleasure) with State A's exposure distribution, but instead using the Countrywide distribution.
- Reversing the numerator and denominator of the Adjustment Factor (i.e. calculating 1/Adj. Factor)
- Only using a subset of the data given (e.g. using only Truck data, or just the Work data) instead of the entire data table of data.

Part b

Candidates were expected to know the 2 advantages of using the Current Rate Method to determine a complement as opposed to using Harwayne's Method.

Common mistakes included:

- Stating availability of the data as an advantage. Both methods have available data, so this is not an advantage.
- Stating that the Current Rate was easier to explain but not stating why.
- Stating that Current Rate method would minimize disruption.