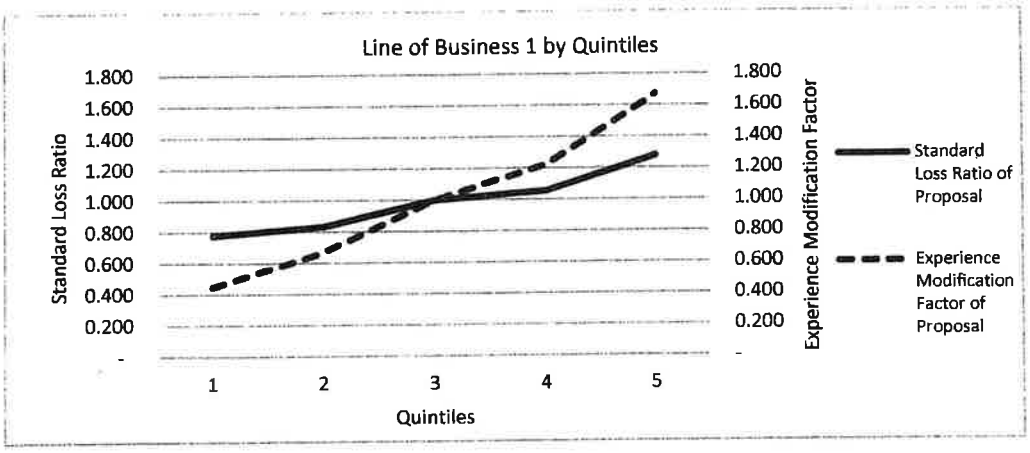
10. (1.5 points)

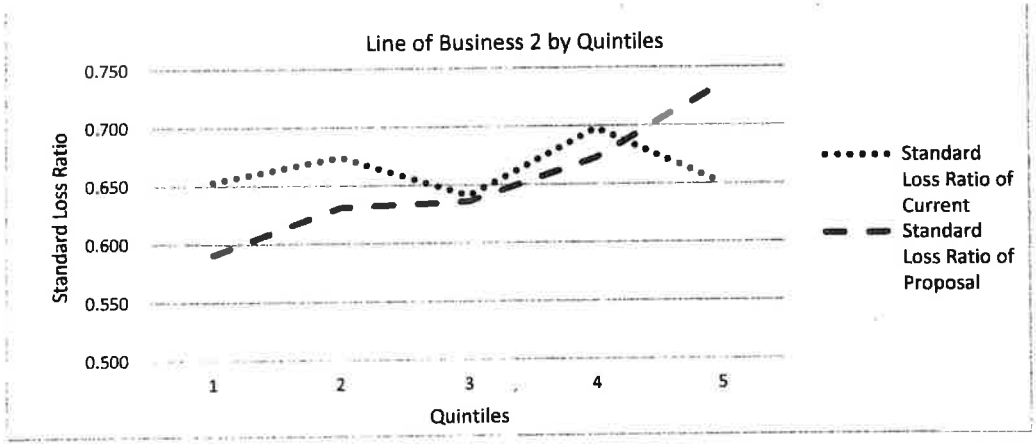
An actuary has created new models to calculate the experience modification factor for two lines of business.

Given the following:

- Line of business 1 (currently does not use experience rating)



- Line of business 2 (currently uses experience rating)



Line of Business 2	Efficiency Test
Current Plan	0.0346
Proposed Plan	0.1184

For both lines of business, assume that the cost of implementation is negligible.

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a. (0.5 point)

For line of business 1, evaluate whether the new experience modification should be implemented.

b. (0.5 point)

For line of business 1, describe a way to improve the results of the experience modification.

c. (0.5 point)

For line of business 2, evaluate whether the proposed plan should be used.

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QUESTION 10	
TOTAL POINT VALUE: 1.5	**LEARNING OBJECTIVE(S): B4**
SAMPLE ANSWERS	
Part a: 0.5 point	

Sample 1
Implement to charge more equitable premiums and avoid adverse selection. Experience mod is correcting for risk differences

Sample 2
Standard loss ratio is increasing, which indicates credibility to the experience is not high enough. Without the experience modification factor, the manual loss ratio would have a steeper increasing trend than the standard loss ratio. So the proposed plan should be implemented

Sample 3:
Standard LR=loss/standard prem=loss/(manual prem * mod) = manual LR/Mod
Without proposed mod, loss ratios would have more dispersion (ex quintile 1 manual LR=0.8*.4 = 32%) The mod appears to be identifying risk differences and somewhat correcting them

Sample 4:
Yes, the standard LR of proposal is flatter than the E-mod line, indicating the model is doing a good job of correcting manual LRs for differences in risks.

Sample 5:
As exp mod increases, the std LR of proposed plan still has an upward trend as opposed to flat. However there is no experience rating currently implemented so the manual LR curve would be even steeper, so there is currently even less individual risk equity. I would implement the proposal to improve risk equity.

Sample 6:
Yes because the new mod reduces the variance of the SLR relative to the manual loss ratio

Sample 7:
From the graph we see that the plan does not perfectly produce a standard LR that's flat across quintiles, but it is better than not having mod at all. E.g. for quintile 1, if the mod is not applied, the premium would be higher and the SLR would be even lower, which is not desirable. Thus it should be implemented.

Sample 8:
Yes, the graph shows there can be better segmentation of risks from low to high and the experience rating will allow the insurer to achieve same level of profitability across all risks

Sample 9:
I would implement the new mod because the standard loss ratios are flatter than the mod factor which suggests the mod factor does a somewhat decent job at correcting for differences

between risks. Without the experience plan, worse than average risks will be even more underpriced and the company could be adversely selected against

Sample 10:

Quintile	SLR	Mod	MLR=SLR*Mod
1	0.79	0.42	0.33
2	0.81	0.62	0.50
3	1.00	1.00	1.00
4	1.03	1.20	1.24
5	1.28	1.65	2.11

So since MLR have high positive trend, the model is good at identifying risk difference. The model partially corrects for risk difference because in the SLR there is small positive trend. Model doesn't give enough cred. It is better than the current model, but can be improved. Should be implemented.

Part b: 0.5 point

Sample 1:
Not enough credibility is given to actual experience because of increasing standard loss ratios, so give more credibility to actual experience

Sample 2:
Give more weight to actual experience, this will reduce premium for low mods and increase for high mods. The final product should be standard LR that do not have a trend

Sample 3:
The results can be improved by increasing the credibility. Reducing K in Z = E/(E+K) given to actual loss experience

Sample 4:
Experience mod results can be improved by increasing the mod in quintile 5 and decreasing in quintile 1 so that standard loss ratios are more consistent across quintiles

Sample 5:
Give high mod risk more of a debit and low mod risk more of a credit to avoid anti-selection

Part c: 0.5 point

Sample 1:
No, do not use. Current standard LR is flatter than proposed SLR. Also efficiency test shows same conclusion. Current<proposed. Current is better at accounting for experience.

Sample 2:
Do not use proposed plan. Standard loss ratios should be close to constant (supports current) and prefer a lower efficiency statistic (supports current)

Sample 3:

Proposed plan has higher efficiency test statistics and also the standard LR has an upward trend. The current plan works better
EXAMINER'S REPORT
Candidates were expected to be able to be able to compare the Manual LR to the Standard LR.
Part a
Candidates were expected to be able to identify/calculate the Manual LR from the graph provided and compare it to the Standard LR. Two of the points must have been made in order to receive full credit. A common mistake was stating that the plan should not be implemented since the Standard LR was not flat.
Part b
Candidates were expected to be able to identity that not enough credibility was assigned to the loss data since there as an increasing trend in the Standard LR. Full credit was awarded for one explanation of how to improve the model and for an explanation on why the model needs to be improved, or an additional reason or if both reasons on how to improve the model were provided. If candidate wrote about the credibility in Part A and did not mention everything in Part B, the responses in Part A was considered for Part B since this was a common mistake. Simply stating that the credibility needed to be adjusted was not an acceptable response.
Part c
Candidates were expected to be able to compare quintile charts as well as efficiency test statistics.