

EDUCATION STRATEGY COMMITTEE AND ASSESSMENT COMMITTEE

SUBJECT RESULTS – SEMESTER 1 2022



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GOVERNANCE

1.1. Education Strategy Committee

The Education Strategy Committee objectives are to:

- develop and implement the strategy for the Qualification and Continuing Professional Development education programs which align with the strategic objectives of the Actuaries Institute; and
- oversee the continuous improvement and delivery of these programs so that they continue to be regarded as 'best practice' internationally, attract high quality candidates, and produce professional actuaries who are recognised and valued for their authoritative and relevant advice.

The Education Strategy Committee is responsible for the approval of the pass lists and prizes of the Institute's Qualification education program.

1.2. Assessment Committee (ESC Sub-committee)

The Assessment Committee is primarily charged with fulfilment of Education Strategy Committee responsibilities to:

- approve assessment principles and guidelines for the Qualification education programs; and
- approve pass lists and prizes of the Qualification education program.

1.3. Results meeting

The joint Education Strategy Committee/Assessment Committee meeting to approve results was held on 2 June 2022. Chief Examiners, Independent Examiners and invited Institute staff also attended.

The minutes are available on request. Actions arising have been recorded and will be managed by Mike Callan, Executive General Manager Education and his team.

The provision of education is a high-profile function of the Actuaries Institute. The Chair of the Education Strategy Committee sincerely thanks the committee members, Institute staff, Independent Examiners and the many volunteers for their efforts to teach, assess, mark or review the Actuary and Fellowship subjects.



RESULTS

Table 1 – Subject Results

		S1 2022	S1 2022	S2 2021	S2 2021	S1 2021	S1 2021
Subject	Abbvn	Sat	Pass Rate	Sat	Pass Rate	Sat	Pass Rate
Actuary:							
Asset Liability Management	ALM	129	92%	73	88%	115	94%
Communication, Modelling and Professionalism	CMP	201	92%	171	95%	213	96%
Fellowship Module 1 and 2:							
Banking	BANK	-	-	-	-	-	-
Enterprise Risk Management	ERM	59	56%	-	-	-	-
General Insurance and Health Pricing and Portfolio Analytics	GIHPPA	-	-	158	50%	-	-
General Insurance and Health Valuation	GIHV	166	57%	-	-	122	33%
Investment	INV	-	-	30	84%	-	-
Life Insurance and Retirement Product Development	LIRPD	-	-	119	79%	-	-
Life Insurance and Retirement Valuation	LIRV	115	58%	-	-	101	57%
Fellowship Module 3:							
Data Analytics Applications	DAA	90	81%	53	77%	-	-
General Insurance Applications	GIA	24	79%	-	-	-	-
Life Insurance Applications	LIA	57	53%	31	65%	47	55%
Superannuation and Retirement Applications	SRA	7	71%	-	-	2	100%
Commercial Actuarial Practice	CAP	14	50%	47	57%	73	55%

Table 2 – Number of eligible new Fellows

2022 (1)	2021 (2)	2021 (1)	2020 (2)	2019 (2)	2019 (1)	2018 (2)	2018 (1)
79	52	46	46	51	29	29	27



Assessment Committee Report

Semester 1 2022

Table 3 – Prize Winners

Subject		Candidate Number	Student Name
Actuary:			
Asset Liability Management	Andrew Prescott Prize	221577	Wanzhang Jing
Communication, Modelling and Professionalism	Andrew Prescott Prize	221912	David Yan
Fellowship Module 1 and 2:			
Banking	Andrew Prescott Prize	n/a	
Enterprise Risk Management	Andrew Prescott Prize	221910	Andy Wang
General Insurance and Health Pricing and Portfolio Analytics	Andrew Prescott Prize	n/a	
General Insurance and Health Valuation	Andrew Prescott Prize	221435	Jessica Chen
Investment	Andrew Prescott Prize	n/a	
Life Insurance and Retirement Product Development	Andrew Prescott Prize	n/a	
Life Insurance and Retirement Valuation	Andrew Prescott Prize	221825	Sophie Woodbury
Fellowship Module 3:			
Data Analytics Applications	Andrew Prescott Prize	221803	Jessica Yi Chen
		221436	Hasith Wijesekera
General Insurance Applications	Katherine Robertson Prize	221487	Saroop Philip
Life Insurance Applications	Andrew Prescott Prize	221709	Zhuo Chen
Superannuation and Retirement Applications	Andrew Prescott Prize	221358	Thomas Mason
Commercial Actuarial Practice	Andrew Prescott Prize	n/a	



ASSESSMENT PARTICIPANTS

Table 4 – Chief Examiner, Independent Examiner and scrutineers

Course	Chief Examiner	Independent Examiner	Exam Scrutineer(s)	Assignment Scrutineer(s)
ALM	James Purvis	Summer Hsu	Anthony Nguyen Mak Hon Ho Victor Mombeyarara	Kumaran Manoharan
CMP	Janice Jones	Martin Mulcare	Jingchun Chen Edward Djizmedjian	Jingchun Chen Clayton Chiong
ERM	Zachary Tyrell	Martin Considine	Kristy Yee Edmund Shieh Ke Shen Yu Lap Cheng	Ke Shen
GHV	Elaine Pang	Clayton Chiong	Peter Zheng Kushan Fozdar Chun Yiu	Evelyn Tanudjaja
LIRV	Georgina Hemmings	Peter Corbett	Jian Cui Yu Lap Cheng Zhixin Li	Amy Li
DAA	Amanda Aitken	Genevieve Hayes	David Wassef Edmund Shieh	Edwin Zhang Ming-Chak Chan
GIA	Jacqueline Reid	Yongjie Qi	Yu Sun William Liu Cuong Duong	Xuejun Li
LIA	Georgina Hemmings	Anthony Brien	Kumaran Manoharan Kelvin Duong Daniel Clough	Kevin Duong
SRA	Janice Jones	Jim Repanis	Edmund Tsang Tian Kang Lim Su Li Sin	Richard Codron

Table 5 – CAP contributors

Chief Examiner	Exam	Exam Scrutineers
Bruce Thomson	David Service, Colin Priest, Alice Xu, Gaurav Khemka	Paul Ng (ERM), Varun Mulavineth (GI), Janice Cheng (LI), Clarissa Dharma (INV)



Assessment Committee Report

Semester 1 2022

Table 6 – Markers

Assignment Markers				
First Name	Last Name		First Name	Last Name
Jarrold	Bayl		Anita	Mansbridge
Prudence	Chan		Dylan	Neenan
Jinchun (Joey)	Chen		Evelyn	Njoo
Jiani	Chen		Ryan	Park
Eric	Cheng		David	Pitt
Yu Lap (Daniel)	Cheng		Colin	Priest
Simon	Cheng		Kevin	Pun
Daniel	Chew		Ben	Qin
Clayton	Chiong		Andries	Schreuder
Emily	Chong		Martina	Shan
Neha	Chopra		Jia	Shi
Jin	Cui		Gemma	Smith
Junliang (Leon)	Guo		Michael	Storozhev
Kane	Hausfeld		Shiromini	Sugirthanathan
Abby	Huang		Barry	Sun
Hongfang (Emily)	Jing		Desmond	Tam
Stanley	Jour		Jared	Toe
Ying	Kang		Edmund	Tsang
Hannah	Kim		Lawrence	Uy
Rajivan	Krishnan		Solai	Valliappan
Zhe Xuen	Lee		Matthew	Wood
Xuejun	Li		Xiao	Xu
Cecilia	Li		Jason	Yu
Anthony	Locke		Edwin	Zhang



Assessment Committee Report

Semester 1 2022

Final Assessment Markers				
First Name	Last Name		First Name	Last Name
Evelyn	Agustin		Fan	Li
Eli	Barr		Tammy	Lin
Luv	Bhatnagar		Stacey	Lin
Aaron	Blackwell		Changyu (Estelle)	Liu
Julian	Braganza		Anthony	Locke
Anna	Byrne		Nirosana	Maheswaran
Aamir	Chaudhry		Claymore	Marshall
Jack	Chen		Kristopher	McCullough
Jiani	Chen		Evelyn	Njoo
Sijing	Chen		Ryan	Park
Yu Lap (Daniel)	Cheng		David	Pitt
Keith	Cheung		Colin	Priest
Daniel	Chew		Kevin	Pun
Weihao	Choo		Dominic	Roe
Neha	Chopra		Luke	Seberry
Raymond	Chow		Christine	See
Oui Yau	Chuah		Martina	Shan
Travis	Dickinson		Dan Qing	Shi
Jie (Jack)	Ding		Desmond	Tam
Laura	Dixie		Natalie	Tan
Saul	Field		Jim	Tang
Junliang (Leon)	Guo		Phin Wern	Ting
Kane	Hausfeld		Bradley	Tjandra
King Yi (Mak)	Ho		Terence	Tong
Kevin	Hsieh		Edmund	Tsang
Abby	Huang		David	Underwood
Shankar	Jegasothy		William	Wang
Bailin	Jiang		Ashley	Wilson
Tracy	Jiang		Andy	Wong
Stanley	Jour		Kieran	Wu
Ying	Kang		Andy	Yang
Jason	Khou		Peter	Yeates
Margaret	Kwan		Sharon	Yu
Cathy	Lee		Jason	Yu
Alex	Leung		Kelly	Zhang
Kenric	Leung		Fei	Zhang



CHIEF EXAMINER REPORTS - SEMESTER 1 2022

CMP: COMMUNICATION, MODELLING AND PROFESSIONALISM

1. Summary

1.1. Course Overview

The aim of this subject is to enable students to apply their technical, theoretical and practical knowledge in an effective and professional manner for their clients, colleagues or other stakeholders.

The subject teaches effective writing and presentation skills and introduces the concepts of model governance. It covers professional and ethical frameworks and develops a student's ability to think critically and apply judgement. After successfully completing this subject, students will be able to:

- effectively communicate to and with a range of different audiences;
- design, check and communicate a well-constructed model; and
- apply professionalism and ethics in decision making processes

1.2. Assessment

Assessment for this subject is comprised of the following three parts:

- assignment (worth 60%);
- presentation (worth 40%); and
- multiple-choice questions that students must successfully answer to pass the subject.

The assignment assesses a student's ability to communicate effectively in written form and concisely, as a word limit applied. The topic for the assignment draws on the professionalism and/or modelling concepts taught in the subject.

The presentation assesses a student's ability to communicate effectively in spoken form. Students are required to record themselves delivering a five-minute presentation on a specified topic related to professionalism or modelling.



The multiple-choice questions provide students with feedback on their learning after completing each of the subject's modules. Students are required to correctly answer at least four questions for each module. These multiple-choice questions cover each of the subject's key topics of communication, modelling and professionalism.

1.3. Pass Rates

The standard expected from a student in an Actuary level subject such as CMP is that of an individual in their first year of post-graduate work. The intention in this subject is therefore to present assessment material that well prepared students can pass, regardless of their prior work experience or lack thereof.

Approximately a fifth of students received an A grade (80% or more) for the subject, demonstrating that they have very strong communication skills, an excellent understanding of modelling governance and the ability to apply professionalism and judgement in a work context. 92% of students passed the subject, demonstrating that they have competency across these areas.

Table 1 – Subject results

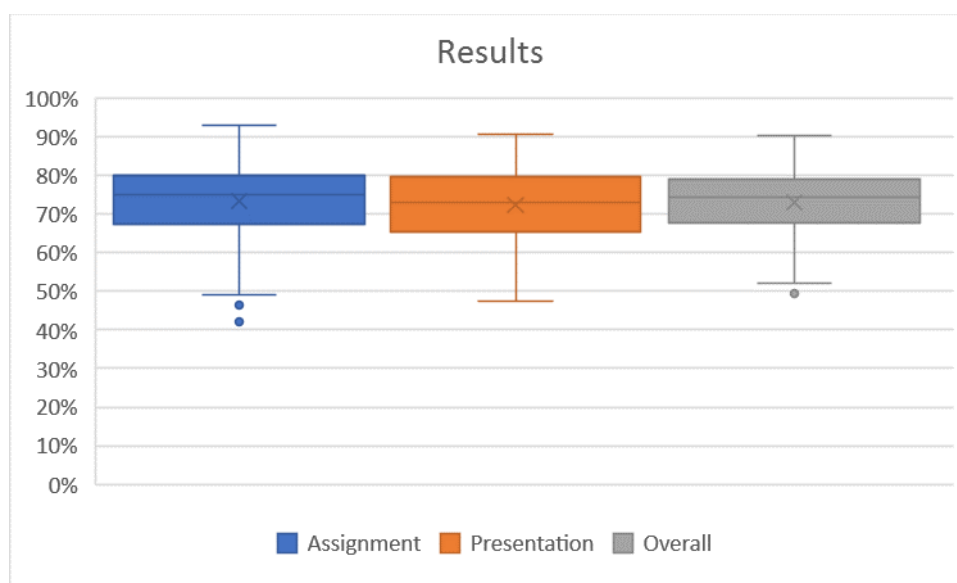
Assessment	Attempted	Passed	Pass rate
Assignment	201	178	89%
Presentation	201	184	92%
Multiple Choice Quiz	201	201	100%
Total	201	185	92%

The overall pass rate of 92% is higher than the pass rate for the assignment (89%). This is because a student can fail one of the assessments but do well enough on the other to pass the subject overall. This semester, 16 students passed having only passed one of the two assessments.

It was confirmed that one student failed for the second time.



Figure 1 – Marks per assessment



Explanation: The box and whisker chart shows the distribution of results into quartiles, highlighting the minimum, maximum, mean (X) and outliers (•). The boxes show the quartiles either side of the median. There may be lines extending vertically called “whiskers”. The range from the bottom of the box down to the bottom of the whisker covers the lowest 25% of results, similarly from the top of the box to the top of the whisker contains the highest 25% of results.

2. Assessment

2.1. Assignment

The main purpose of this assignment is to help students to:

- practise the written communication skills taught in this subject;
- check a model and communicate their findings.

The learning objectives assessed in this assignment are shown below.

Table 2 – Assignment learning objectives

Question	Learning objective	Module	Weight
1 Email Content	1.1.1. Determine the purpose and target audience of the communication 1.1.3. Evaluate the needs of a target audience	M02	15%



Question	Learning objective	Module	Weight
1 Email Clarity	1.2.1. Apply appropriate structure to a piece of written communication 1.2.2. Use language and a level of detail appropriate to the target audience 1.2.4. Apply techniques for reviewing written communication	M03	10%
2 Model Examine	2.2.1. Explain the key elements of a good model structure 2.3. Check a model using a variety of techniques, such as spot and high-level checking, sensitivity testing and technical review	M06	20%
2 Model Document	1.2.1. Apply appropriate structure to a piece of written communication 2.4. Document a model, including its purpose, data, key assumptions and methodology used, checks performed, outputs, sensitivities and limitations	M02 M06	10%
2 Model Uncertainty	2.5.3. Communicate the uncertainty, reliances and limitations associated with the model's outcomes	M06	10%
3 Argument Map	3.7.1. Explain the four main stages in the process of critical thinking 3.6.1. Manage personal workflow using a triangle approach	M10 M11	15%
3 Conclusion	1.4.3. Describe ways to increase personal influence	M05	15%
3 Clarity	1.2.1. Apply appropriate structure to a piece of written communication 1.2.2. Use language and a level of detail appropriate to the target audience 1.2.4. Apply techniques for reviewing written communication	M03	5%

2.2. Presentation

The main purpose of this assessment is for students to:

- practise the presentation skills taught in this subject;
- effectively communicate with a range of different audiences; and
- apply professionalism and ethics in decision making processes.

The specific skills that are being developed and assessed in this assessment are:

- apply subject material in an unfamiliar context;



- examine the role of professionalism and ethics in actuarial work;
- examine the principles of the Actuaries Institute Code of Conduct;
- explain the purpose and process of the Disciplinary Scheme;
- determining the purpose and target audience of a communication;
- planning a presentation to suit its audience and achieve its aim;
- applying structure to a presentation;
- preparing for a presentation by making speaking notes, creating visual aids and practising;
- using appropriate body language, spoken language and voice control to engage your audience;
- presenting with confidence;
- meeting business standards for presentation of work.

The learning objectives assessed are shown in Table 3.

Table 1 – Presentation learning objectives

Question	Learning objective	Module	Weight
Structure	1.1.1. Determine the purpose and target audience of the communication	M02	30%
	1.3.1. Plan a presentation to suit its audience and achieve its aim		
	1.3.2. Apply structure to a presentation		
Engagement	1.3.3. Prepare for a presentation by making speaking notes, creating visual aids and practising	M04	40%
	1.3.4. Use appropriate body language, spoken language and voice control to engage the audience		
	1.3.5. Present with confidence		
Content	3.1. Examine the role of professionalism and ethics in actuarial work	M07	30%
	3.4.1. Examine the principle of integrity	M08	
	3.4.2. Examine the principle of compliance		
	3.4.5. Examine the principle of speaking up		
	3.5.4. Explain the purpose and process of the Disciplinary Scheme and how it links to the Code of Conduct		

2.3. Multiple-choice questions

The main purpose of the multiple-choice questions was to help students reflect on the key points in each of the subject's modules and test knowledge. 36 of 46 (78%) of the subject's learning



objectives were assessed in the multiple-choice questions this semester.

Across the three assessments, the students were assessed at skill levels consistent with the targets set out in the syllabus, as shown in Table 4.

Table 4 – Skills assessment results

Assessment	Marks Weight	Effort weight	K (SA)	A	H
Assignment	60%	48%	15%	70%	15%
Presentation	40%	32%	10%	40%	50%
Quizzes	0%	20%	100%	-	-
Total	100%	100%	30%	46%	23%
Target			30%	50%	20%

3. Results by assessment component

3.1. Assignment

The assignment brief was to provide informal advice to a financial planner in relation to benefit project models, including:

- write an email with an explanation of the Institute's views on modelling, drawing on Actuaries Digital articles;
- assess the provided model for structure, reliability, documentation, and limitations, and prepare a file note of findings; and
- prepare an argument map that addresses whether she should continue to use the model then write an email presenting the reasons and conclusion.

Students who performed well in this assignment:

- used clear structure and language to make it easy for markers to find their responses to each aspect of the marking rubric;
- tied each of their answers to the specific context of the assignment;
- were succinct, to the point, had a logical flow, and were not repetitive;
- thoroughly checked the model and gave specific (not generic) comments in Question 2;

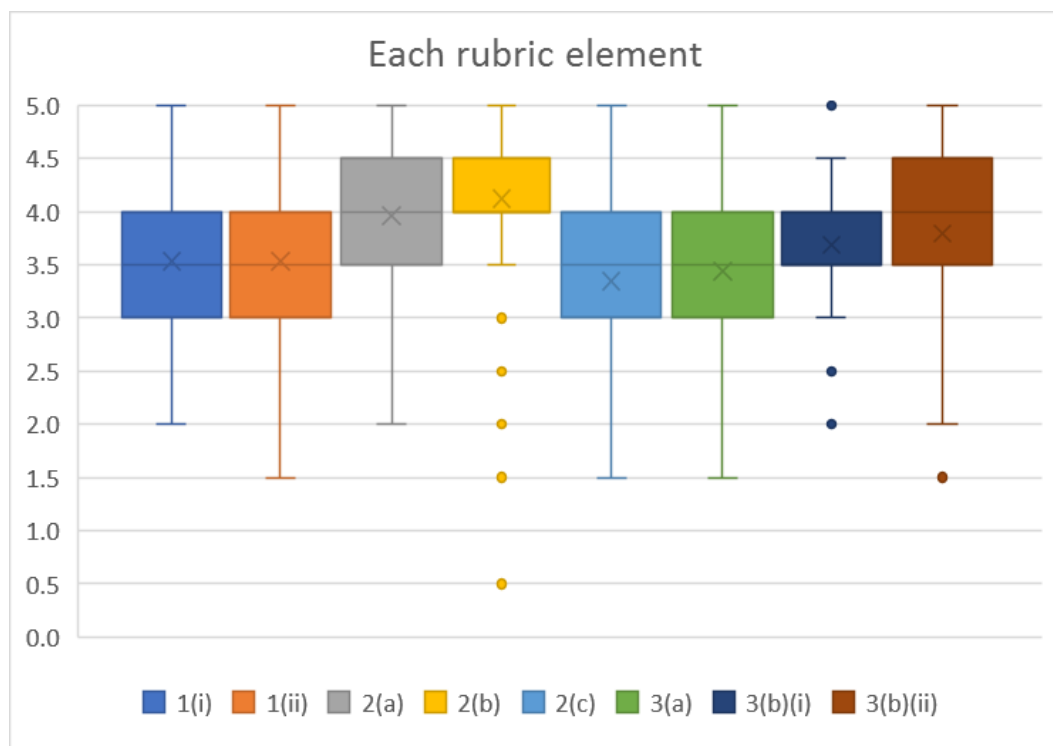


- applied the argument map rules;
- incorporated their argument map reasoning into their email in Question 3b;
- incorporated persuasive techniques in the 3b email; and
- ensured there were no spelling or grammatical errors.

Many students had at least one area of weakness in their response including:

- waffly, long winded text which made it hard for markers to find responses to each rubric criterion;
- inappropriate language for reader;
- poorly structured emails;
- not demonstrating any awareness of the learning materials—even where directed to do so (notably for model checks or argument maps);
- not addressing the requirements given in the rubric;
- not giving specific feedback on the model;
- allowing obvious spelling or grammatical errors (that a basic spell check would have identified); or
- used technical terms with no explanation.

Figure 1 – Marks per assignment rubric element



Explanation: As for previous figure and note that these results are before any penalties applied.



Observations on the results:

- on average students performed at an at least pass (3/5) level on each component of the question;
- students performed strongest, on average, on 2(b) model documentation, which likely reflects the direct application of the course materials as well as existing modelling skills and knowledge (4.1/5);
- notably this was offset by 2(c) being the weakest element, where many students could not find a way to simply convey the message that the model had limitations (due to its' simplistic methodology and assumptions) and that the projected outcome it shows is not the only possible outcome (that is, the future outcome is uncertain) (3.3/5);
- the concise and complete responses, which the markers found easy to follow and mark against the rubric criteria, had few or no spelling or grammatical errors. Markers believed that these were typically students that had taken the time to draft, review, edit and improve their responses before submission. Undertaking this self-review process is essential for everyone, in any workplace;
- Significantly Above Pass responses covered the required content and also focused on presentation and readability. Language, structure and style were all targeted to the given audience and required format, for each element of the assignment; and
- the lowest scoring students generally had at least two of these weaknesses discussed earlier.

A separate document for students provides general feedback about the assignment, as well as specific feedback on each assignment question. It also includes an example of an assignment graded as 'Significantly above pass level'. The same feedback document is sent to all students, rather than individual student feedback being provided.

The results for the Assignment are shown in Table 5.

Table 5 – Assignment grades

Grade	Mark required	2022 S1 Number	2022 S2 %	2021 S2 Number	2021 S2 %
Significantly above pass	80%	51	25.4%	74	43%
Above pass	70%	86	42.8%	63	37%
Pass	60%	41	20.4%	25	15%
Below pass	40%	23	11.4%	9	5%



Grade	Mark required	2022 S1 Number	2022 S2 %	2021 S2 Number	2021 S2 %
Significantly below pass	10%	0	0%	0	0%
No attempt	0%	0	0	0	0
Total		201	100%	171	100%
Did not attempt		0	-	1	-

Results after penalties applied.

3.2. Presentation

The presentation brief was to investigate and present to the partners (all Fellows) at the student's employer, an actuarial consulting practice, on "What can our firm learn from the KPMG 'cheating scandal'?". Students were requested to cover the nature of the professional breach at KPMG, possible causes, the equivalent actuarial professional obligations, the relevant code of conduct principles, possible disciplinary outcomes and conclude with steps for the practice to take to prevent a similar breach.

Students were required to record their presentation and submit via a YouTube link. Visual aids could be used and student were requested to comply with a set of presentation guidelines.

In general, students who performed well in this presentation:

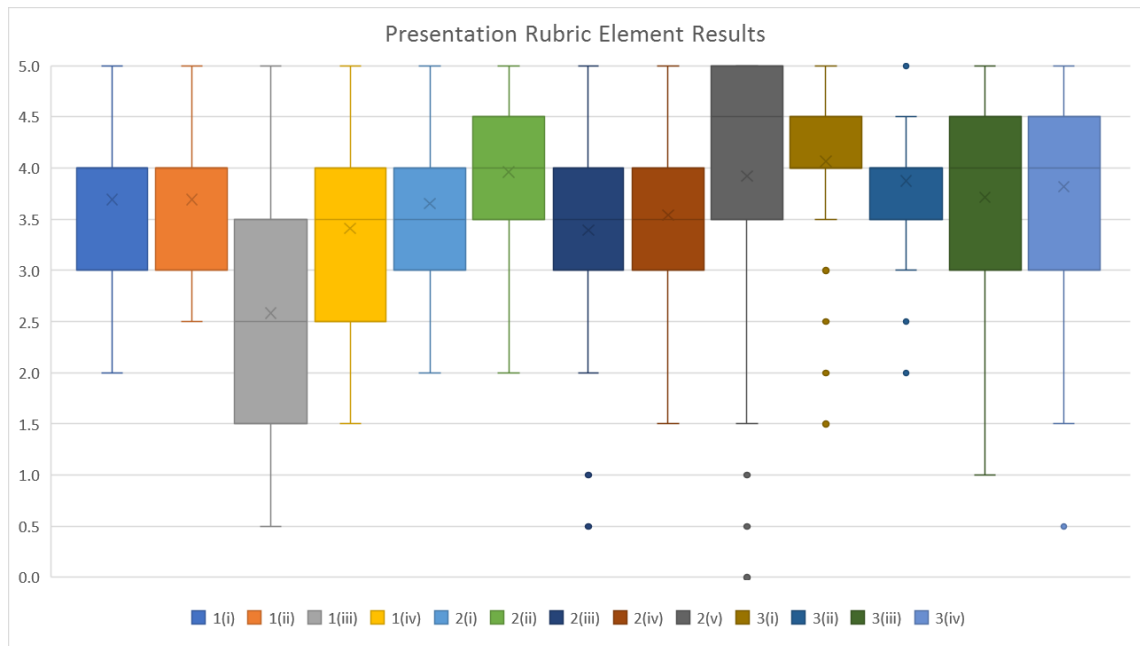
- read and responded to each element of the rubric to at least the pass standard;
- spoke clearly but succinctly, using appropriate language, to address all aspects of the presentation rubric;
- minimised distracting elements;
- included a hook and persuasive language throughout the presentation; and
- included a closing section in their presentation while remaining within the time limit.

Students who performed poorly were generally found to have not prepared well enough and not rehearsed their presentation, including:

- neglecting the basic instructions for the presentation (e.g. upper body to be visible);
- significant detracting elements that persisted throughout the presentation;
- lacking structure;
- no concluding remarks (often due to lack of time); and/or
- had poor use of visuals in their presentations – either overly detailed or non-existent.



Figure 2 – Presentation marks



Explanation: As for previous figure and note that these results are before any penalties applied.

Generally average marks were between 3 and 4. Notably, the average mark was highest for element 2(ii) – clarity of expression and 3(i) - explaining what actually happened. Over half the students achieved at least a 4 (above pass) for these elements.

In contrast, the average mark was lowest for element 1(iii) regarding a clear, concise ending summarising the key points and a call to action.

The rubric had three key areas:

- structure;
- engagement; and
- content.

Structure: This section had the lowest marks with more than half of the students unable to deliver an 'end' that listed key points and made a call to action.

Most opened with listing the presenter, topic and purpose in and had a well-structured middle section. Students scoring 3 rather than 4 for the middle section usually wandered off topic or provided less relevant details (at the expense of having time for examples or an effective conclusion). 117 scored below pass for 1(iii) the ending, as they did not list the key points or did not have a call to action, or both. The markers noted several students appeared to run out of



time and simply cut off their ending, indicating a lack of preparation or rehearsal. A quarter did not use transition statements consistently and only 12 used two-sided transition statements consistency and effectively.

The weaker attempts showed a lack of rehearsal or planning, as a small effort would have made the body of their presentation more concise allowing a clear and effective ending.

Engagement: Delivery was mostly clear and language appropriate for the audience. Students that did not review their work tended to present complex or illegible visuals that did not add value, or had distracting elements (repetitive movements, monotone voices etc) that could have been remedied with rehearsal. Markers found a third of the presentations likely or very likely to be persuasive – these were the confident and polished presenters who ensured they explained the relevance to their audience.

A notable number did not follow the explicit direction to include at least a half body shot and NOT use a Zoom style 'tiny box in the corner'. These students lost up to 4 marks (under 2(v)) hence the long tail of results for this element observed in the Figure.

Content: On average this was the highest scoring section. Three quarters outlined what happened and covered at least 2 causes for the ethical failure. Weaker answers listed 6 types of ethical failure without discussing which might be relevant; or without addressing the KPMG case study at all. All students covered the Institute code of conduct and disciplinary outcomes to some extent, the better responses gave actual disciplinary examples and correctly identified the possible points of failure for each of students and Fellows.

One of the two items 3(iii) discussion of potential points of failure 3 and 3(iv) actions to take, were missing or incomplete for around 10% of presentations. Marker comments indicate this was typically the students that ran short of time and may have skipped this discussion in order to get to their closing remarks.

The visible physical backgrounds (whether home or office or hospital in one case) were not assessed and did not impact marks. A wide range of creative approaches were taken to project a visual image as part of the presentation. The markers' focus was on the clarity, legibility and relevance of the visual materials, to determine whether they supported or detracted from the presentation.

A separate document for students provides general feedback about the presentation, as well as specific feedback on each component of the rubric. It also includes the link to an example



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of a presentation graded as 'Significantly above pass level'. The same feedback document is made available to all students, rather than individual student feedback being provided.

The results for the presentation are shown in Table 6.

Table 6 – Presentation grades

Grade	Mark required	2022 S1 Number	2022 S1 %	2021 S2 Number	2021 S2 %
Significantly above pass	80%	50	25%	46	27%
Above pass	70%	75	37%	70	41%
Pass	60%	59	29%	42	25%
Below pass	40%	17	8%	13	8%
Significantly below pass	10%	0	0%	0	0%
No attempt	0%	0	0	0	0
Total		201	100%	171	100%
Did not attempt		0	-	1	-

Results after penalties applied.

3.3. Multiple-choice questions

All students completed the multiple-choice questions correctly by the deadline.

END



ALM: ASSET AND LIABILITY MANAGEMENT

1. Summary

1.1. Course Overview

The aim of the Asset Liability Management subject, as part of the Actuary-level pathway, is to provide students with an understanding of underlying actuarial principles relevant to Asset Liability Management in a range of commercial and business environments.

After successfully completing this subject, students will be able to:

- discuss the cashflows of simple financial arrangements and the need to invest appropriately to provide for financial benefits on contingent events;
- demonstrate a knowledge and understanding of the characteristics of the principal investment assets and of the markets in such assets;
- explain the principal economic influences on investment markets;
- describe the main features of the behaviour of market price levels and total returns and discuss their relationships to each other;
- discuss the theoretical and historical relationships between the total returns, and the components of total returns, on equities, bonds, cash and price and earnings inflation;
- understand the main principles and techniques of actuarial management and control that are relevant to the management of investments;
- apply these principles to given situations within the context of investment management; and
- analyse hypothetical scenarios, including using judgement to assess the implications of possible actions and to develop appropriate proposals or recommendations relating to the management of investments.

1.2. Assessment

Assessment for this subject is comprised of the following parts:

- assignment (a mid-semester test) (20% weighting); and
- exam (80% weighting).

Assessment of this subject is split across the following skill levels:

- knowledge (or simple application) (30%): demonstration of a detailed knowledge and understanding of the topic;
- application (50%): demonstration of an ability to apply the principles underlying the topic within a given context; and



- higher-order (20%): demonstration of an ability to perform deeper analysis and assessment of situations, including forming judgements, taking into account different points of view, comparing, and contrasting situations, suggesting possible solutions and actions and making recommendations.

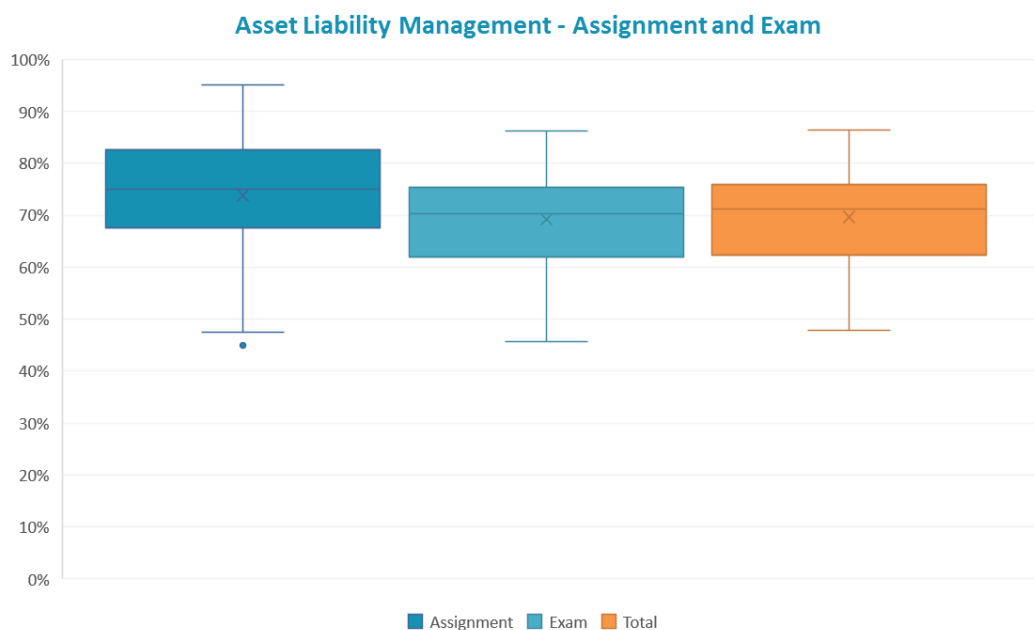
1.3. Pass Rates

It is proposed that the pass mark is 120/200 (60%) and 119 candidates be awarded a pass, which implies a pass rate of 92%.

Table 1 – Subject results

Assessment	Attempted	Passed	Pass rate	S2 2021	S1 2021
Assignment	130	129	99%	89%	99%
Exam	129	119	92%	82%	90%
Total	130	119	92%	88%	94%

Figure 3 – Marks per assessment





Summary of Overall Results

Grade	% of Total Marks	Marks	Candidates	
			No.	%
A	125.0%	75.0	38	29.2%
B	100.0%	60.0	81	62.3%
C	90.0%	54.0	7	5.4%
D	70.0%	42.0	3	2.3%
E	0.0%	0.0	1	0.8%
F	0.0%	0.0	0	0.0%
X	0.0%	0.0	0	0.0%
Total			130	100.0%
Pass Rate (A & B Grades)			119	91.5%

The 92% pass rate for this subject is between the 88% pass rate last semester and 94% the prior semester.

60% was set for a Pass or grade B (60% last semester) and 80% was set for a Strong Pass or grade A (80% last semester). 38 achieved an A grade, 81 a B grade and 11 failed (11/53/9 last semester). The successful students generally passed the assignment and at least 3 of the 4 exam questions. A few had sufficiently strong result in the assignment or one of the questions to offset 2 weak exam questions and generate an overall pass result.

The **assignment** was a test of knowledge and application. A student with broad knowledge of the materials could readily achieve a 50% mark. However evidence of both knowledge and the ability to apply was needed for a higher result. As the pass mark was set at 60% students did have to demonstrate the ability to apply information to a new situation and communicate clearly, in order to pass.

Above Pass and Significantly Above Pass students (the majority of students) showed a good grasp of the materials and were more consistently able to apply them in an unfamiliar context.

Pass level (60% - 69%) students either had less breadth of knowledge when answering the Part A multiple choice questions or were not able to consistently apply their knowledge to an unfamiliar situation in Part B. Examples of the latter are making no reference to the situation presented in the question or not presenting a coherent or clear argument.

Across the exam as a whole, the majority of students demonstrated the required knowledge, the ability to interpret new information and to apply their knowledge to present a coherent answer.



Exam questions two and three were not as well answered as questions one and four.

The papers reviewed below the pass mark tended to indicate either a poor understanding of the questions or of the particular situation presented in the question, and they did not always incorporate the question information into their answer.

2. Assessment

2.1. Assignment

The main purpose of the assignment is to help students develop skills required to pass examinations at Actuary level. These skills are also required by employers. The specific skills that are developed and assessed in the assignment are:

- acquisition of subject knowledge;
- application of subject material in an unfamiliar context; and
- communication of relevant points in language appropriate to the audience, in a logical and coherent manner.

It was made clear to students that the assignment would only cover the content from Modules 2 through to 7. The assignment was delivered online on a specific date and over a 4 hour window to accommodate all locations (UK to NZ). The students were able to refer to their notes and the subject materials.

The assignment format had two parts:

- Part A - 20 multiple choice questions to be completed in 45 minutes (10 marks total); and
- Part B - 2 short answer questions to be completed in 60 minutes (10 marks total), combining for a mark out of 20.

The learning objectives assessed in this assignment are shown in Table 2. For more detail on learning objectives, please refer to the Syllabus.



Table 2 – Assignment learning objectives

Question	Learning objective	Module	Marks	K	A	H
MCQ	1.1, 1.2, 1.3, 1.4, 2.1, 2.4, 2.5, 2.7, 3.1, 3.2, 3.3	M2 – M7	10	10	-	-
Short answer	3.1, 3.2, 3.3	M5, M6, M7	10	5	5	0
Total			20	15	5	0

2.2. Exam

The main purpose of the exam was to assess students ability to:

- demonstrate a correct understanding of subject knowledge;
- analyse information provided about a situation and appropriately incorporate that information with the technical knowledge to generate a response; and
- analyse hypothetical scenarios, assess the implications of possible actions and to develop appropriate recommendations relating to the management of investments.

The questions this semester were built around

- explaining the relevance of investment theories about the equity market to setting an investment strategy and selecting investment managers to meet objectives that are appropriate to the liabilities;
- types of asset liability matching;
- setting assumptions for asset liability modelling;
- the advantages and disadvantages of deterministic and stochastic models in asset liability modellings;
- explaining the liabilities that need to be funded and the components of an investment policy;
- setting investment objectives for asset portfolios having regard to the characteristics of the liabilities;
- assessment of an unlisted investment, having regards to features, risk and return characteristics, how to mitigate risks and a description of uncertainties that need to be taken into account in the valuation of unlisted assets;

The learning objectives assessed in this exam are shown in Table 3.



Table 3 – Exam learning objectives

Question	Syllabus Learning Objective	Section Reference in Modules	Total Marks	K	A	H
1	1.3, 3.2, 3.3, 5.1, 5.2, 5.3, 6.2, 6.5	See below	18	0	16	2
2	1.1, 1.2, 1.3, 3.4, 5.3, 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7	See below	22	10	5	7
3	3.1, 3.2, 3.4, 6.1, 6.2, 6.4, 6.5, 6.6	See below	19	10	5	4
4	3.1, 3.2, 3.3, 3.4, 6.3, 6.6, 6.7	See below	21	4	13	4
Total			80	24	39	17

In summary, the allocation of assessments between knowledge, application and higher order is shown in Table 4.

Table 4 – Allocation of marks

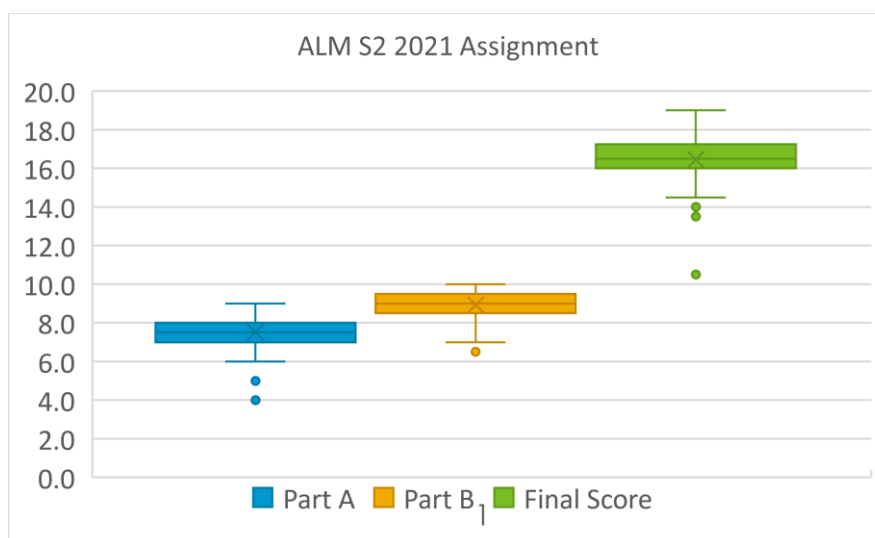
Assessment	Total	K	A	H
Exam	80	24	39	17
Assignment	20	15	5	0
Actual	100	39	44	17
Target	100	30	50	20



3. Results by assessment component

3.1. Assignment

Figure 4 – Marks by section of the assignment



Overall, students performed well on the assignment with a pass **rate** of 99% with an average **score** of 82% and average **grade** of "significantly above pass level". The average score on part A (Multiple Choice) was 76% while the average score on Part B (Short answer) was 89%.

A percentage mark of 60% or greater was required in order to pass the assignment. A summary of the results is presented in the following table, with Semester 1 and Semester 2 2021 for comparison.

Grade	Percentage mark	Number of students	Percentage of students	Sem 2 2021	Sem 1 2021
Significantly above pass level	[80%, 100%]	101	78%	36%	55%
Above pass level	[70%,80%)	24	18%	34%	30%
Pass level	[60%, 70%)	4	3%	19%	12%
Below pass level	[40%, 60%)	1	<1%	11%	-
Significantly below pass level	[1%, 40%)	-	-	-	3%
Did not attempt	[0%, 1%)	-	-	-	-
Grand Total		130	100%	100%	100%



Compared with Semester 2 of 2021, it appears that either the assignment was less difficult or more students were well prepared. I believe it is mostly the latter as:

- the results were similar to, although somewhat better than, those achieved in S1 of 2021;
- the Part A questions were partially the same questions as in previous semesters, and in all cases set by direct reference to the course materials, so not materially more difficult;
- the Part B questions were similar in style and short, and many students answered very well with the average mark for Part B being 8.91 (89.1 %); and
- question 2(a) which was worth 3 marks was a relatively straightforward question with a significant numerical content which may have been easier for the students than an alternative type of question.

Part A questions were largely bookwork and designed to assess if the student had read and understood the materials in modules 2 to 7 and were able to read and interpret the questions. This part was generally well done with 128 out of 130 students passing. The average score was 7.58 out of 10.

The Part B questions were designed to assess if the student could apply the materials to specified situations. The stronger responses:

- attempted all the questions;
- answered what was asked in the questions ; and
- clearly linked each point being made to the particular situation given, rather than simply restating the learning materials.

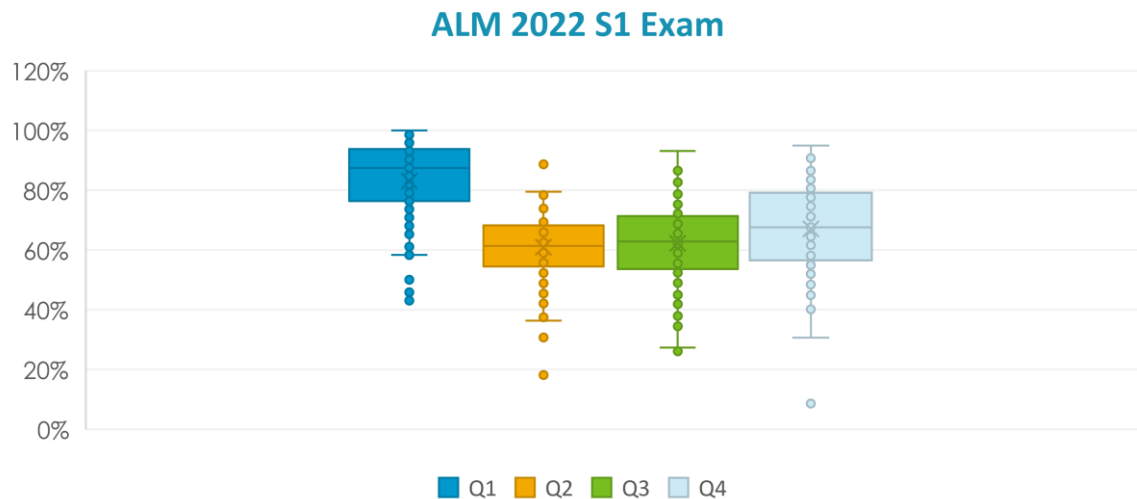
The weaker responses:

- did not answer some questions; or
- gave answers that:
 - failed to answer the question that was asked;
 - were too brief; or
 - were too incoherently written to be well enough understood to gain full marks.



3.2. Exam

Figure 5 – Marks per exam question



129 students submitted an exam script. Question 2, which had the highest proportion of higher order assessment, appears to have been the most difficult for the candidates. Question 3 had a lower but still substantial proportion of higher order assessment and appears to have been the next most difficult on which to score a higher mark.

Exam overall

The exam had a heavier focus on application and higher order skills than the assignment. Students could not rely on simply searching the subject materials for the answer to obtain an overall pass. The students that could interpret the question, apply the materials correctly to the given situation, supply reasons for their results or choices and construct a logical argument were more likely to achieve strong passes.

Pass students covered the relevant knowledge in most questions and made an attempt to address the specific situation in some questions. Fail students could not consistently provide the relevant knowledge and some made insufficient attempt to incorporate the information given in the questions relating to particular situations.



Question 1

This question was very well done by most students with 77% achieving a strong pass. The content of the question parts was mostly at the application level (16 marks out of the total of 18). There was not a great degree of variation in the quality of the answers provided to this question. The average mark for the question was 14.8 out of 18 with a standard deviation of 2.8.

The relatively few weaker answers indicated that the student either had not read or had not understood the question or was not relating the answer back to the specific situation set out in the question. Weaker answers:

- did not apply the information provided in the question or showed that they misunderstood it;
- showed weakness in their understanding of the Efficient Market Hypothesis, in its various forms, and the implication of these forms for the use of technical or fundamental analysis in equity portfolio management;
- provided a response that did not answer the question, or answered only part of the question, or was too brief to show that they understood the point that they were making or did not relate back to the question, such as the Board's investment beliefs;

Question 2

This question was not as well done as question 1. Only 8% achieved a strong pass out of 58% who passed. The average mark for the question was 13.3 out of 22 with a standard deviation of 2.7.

The content of the question parts was 10 knowledge, 5 application and 7 higher-order,

Overall, most candidates were able to apply the ALM subject matter to the defined-contribution superannuation fund scenario as described in the question.

- Question (a)(i) was a straightforward question which candidates scored most of the marks available easily. All candidates were able to identify the exact and appropriate matching strategies but only a few were able to identify "no matching" as a strategy which may be appropriate in conditions of significant uncertainty applying to the liabilities. Candidates typically listed a "replicating portfolio" as a matching strategy, even though some did identify it as a type of partial matching.
- Question (a)(ii) All candidates selected an approximate or partial matching strategy as most applicable to the fund. Stronger candidates provided a clear reason as to why exact matching would be inappropriate for this superannuation fund scenario. Candidates did not



identify exact matching as a strategy in the previous subpart and therefore all failed to achieve the mark available for identifying this as the appropriate strategy in the situation presented. This was a test of the candidates' ability to think at a higher order level which they mainly failed.

- Most candidates correctly identified two types of asset liability matching in (a)(i) but very few identified 'no matching' as the correct strategy for the fund in (a)(ii). Students provided the 'replicating portfolio' as a third alternative, however in their responses should have recognised that they were effectively describing approximate or partial matching as well. Half marks were awarded to students who were able to justify approximate matching as the correct strategy in (a)(ii), e.g. if there were liquidity considerations to be made, however students did not appear to draw the conclusion that as the super fund does not bear any investment risk and cashflows are long-dated, a no matching strategy is the most sensible. As one candidate correctly pointed out "Replicating portfolios are a tool used to apply exact or approximate matching and therefore should not be considered as a 'type' of asset liability matching".
- Question (a)(iii) was fairly well attempted overall which most candidates scoring above half of the marks available. However, there was also a wide dispersion in the marks scored. Stronger candidates were able to systematically identify the unique features of the fund that impacted investment strategy. Weaker candidates relied heavily on textbook theory to the extent that some answers failed to even mention the specific features of the fund. Some students misunderstood the Retirement Income Plan (RIP) to be similar to an annuity, where the income was guaranteed, although the question clearly states that "there is no guarantee that the member's account will not reach zero before death".
- Question (a)(iv) was poorly answered overall with a wide dispersion in marks scored. Generally, the investment objectives that had been requested were poorly structured with often a lack of or inappropriate time frame. The background reasoning was generally poorly attempted and this was where marks were mostly lost. For example, students would have seen examples of risk and return objectives in their studies and could replicate the structure in their answer but failed to convincingly justify why they have proposed the objectives in reference to the scenario set out in this question. The risk objective was almost always related back to the regulatory annual performance test (APT) requirement without independent consideration for the interests of members of the fund. This is a significant shortcoming in terms of professional judgement and was another area where marks were lost. Some



stronger candidates were able to provide background reasoning referencing inflation and longevity risks.

- Questions (a)(iii) and (a)(iv) were generally well answered with better answers correctly interpreting and incorporating the implications of the RIP and APT. For (a)(iii) students should have recognised that they needed to consider multiple aspects of the investment strategy, such as a) age profile and member entry/exits, b) the RIP minimum, c) the APT's consequences on returns and ability for the fund to achieve economies of scale and d) types of assets. (a)(iv) was particularly poorly answered by some students who stated that the risk objective should be with reference to the APT.
- Question (b)(i) - Candidates performed well in the “textbook questions” such as those in part b) where candidates were asked to compare deterministic models against stochastic models. This subpart was answered moderately well, and candidates were able to score easy marks for identifying advantages and disadvantages of deterministic models compared with stochastic models. Candidates were not as strong in delineating the features of stochastic models. Many candidates did not structure their answers well and tried to imply that advantages of one type of model were disadvantages of the other. Marks were missed for not providing fuller reasoning that demonstrated a robust understanding of the models.
- Question (b)(ii) – This question was answered very well and most candidates were able to score full marks quite easily.
- Question (c) – This question was poorly attempted on average with a wide range of marks scored. The question was challenging, requiring the students to think through the various ramifications of the APT from different standpoints (Board/management and investors). Students either got the points or did not. The lack of structure in the candidates' answers suggested that students were not confident in their answers, but were time pressured to write the first thing that came to mind. A common misconception was that the APT requirement provided a safeguard against investment capital loss and therefore good measure to preserve capital, whereas it was clearly described in the question as a relative performance test. Many candidates appeared to misunderstand what was meant by the ‘benchmark’, with few correctly recognising that the APT could result in the Board / management focussing on the shorter term need to pass the test at the expense of the longer term best interests of members. Responses were varied however very few recognised that this was a question in relation to passive versus active management. Some interpreted the question to mean an arbitrary benchmark and not one that referenced the benchmark portfolio of the SAA



Question 3

16% of candidates achieved a strong pass out of the 58% who passed this question. The average mark for the question was 11.7 out of 19 with a standard deviation of 2.7.

The content of the question parts was 10 knowledge, 5 application and 4 higher-order,

Overall, most candidates were able to apply the ALM subject matter to the charitable fund scenario as described in the question, but some struggled to explain the nature of the liabilities that were being funded in this less familiar type of organisation. This question was therefore a test of the candidates' ability to read and understand as well as their ability to write and explain their understanding.

The parts of the question that required knowledge (a ii and c) were well done by most candidates. Part b, which required candidates to propose, with their reasoning, a set of investment risk and return objectives, was more of a challenge for many candidates, and the results for this question part were more widely dispersed. It was a good discriminating question.

Question 4

Q4 was generally better answered than questions 2 and 3. Overall, for question 4, 35% of candidates achieved a strong pass out of the 67% who passed this question. The average mark for the question was 14 out of 21 with a standard deviation of 3.2, showing a wider dispersal of marks than the other questions in the exam.

The content of the question parts was 10 knowledge, 5 application and 4 higher-order,

Part a) of the question was about how to analyse an unlisted equity investment applying the SYSTEM T framework. There had been coverage of this in the tutorials. This question part was well done with an average mark of 5.5 out of 7 marks available.

The majority of candidates successfully analysing the asset (unlisted shares in a toll road company GTR) as an asset of the fund using SYSTEM T. "Term" and "Expenses" were not as well answered. Some students mistook the Fund's investment objective term of 10 years as the term of the GTR asset. Some students were confused that GTR is a private equity firm that owns toll roads and not a direct investment in infrastructure and stated that the expenses of managing infrastructure are extremely high.



Part b) asked candidates to explain characteristics of unlisted assets which lead to risks that need to be managed or mitigated. It was not as well answered with an average mark of 1.3 out of 2, although most students could provide two characteristics of unlisted assets which lead to risks that need to be managed or mitigated.

Part c) asked candidates to explain why the asset in the question (unlisted shares in a toll road company) was suitable for a defined benefit superannuation fund, having regard to its liabilities and its current surplus position. This was reasonably well answered with an average mark of just over 2.8 out of 4. Most candidates could provide two or three reasons why GTR was a suitable asset for the Fund. A few students noted that GTR is a suitable investment as the asset and the liabilities are denominated in the same local currency and the dividend is paid in the local currency and therefore well matched. Marks were also awarded where candidates addressed why GTR is suitable for the fund based on the fund's surplus.

Part d) asked candidates to describe the uncertainties that need to be addressed in the valuation of the asset. This was not well answered with an average mark of 1.8 out of 4. Some candidates focussed on a description of the valuation method rather than what was asked in the question. A number of students described the uncertainties in setting various assumptions for a number of valuation models rather than answering the question by describing the uncertainties that need to be addressed in the valuation of the asset.

Part e) asked candidates to propose with reasons, two other types of assets that may be suitable for the Fund. This required the candidates to set out why they were suitable and not just to list the assets and their main characteristics. It went to the heart of matching asset suitability to the nature of the liabilities. It was reasonably well answered with an average mark of 2.9 out of 4. It was a challenge for the weaker candidates and proved to be one of the discriminating question parts.

END



LIRV: LIFE INSURANCE AND RETIREMENT VALUATIONS

1. Summary

1.1. Course Overview

This subject aims to provide students with an understanding of how actuarial judgement is required when considering the purpose of a valuation. Implications of different methods, models and assumptions are discussed through considering liability valuations (life insurance and retirement), risk-based capital requirements and appraisal values.

After successfully completing this subject, students will be able to:

- assess cash flows arising from savings and risk products from the viewpoint of product providers;
- plan and produce appropriate methods, models and parameters to value uncertain future cash flows;
- apply their valuation knowledge to calculate policy liabilities, benefit liabilities, emerging profit, capital adequacy margins, the economic value of a life insurer and the net position (surplus/deficit) of a retirement fund; and
- set out a process to analyse the change in profit, surplus or embedded value.

1.2. Assessment

Assessment for this subject was comprised of the following parts:

- assignment (20 % weighting); and
- exam (80% weighting)

1.3. Pass Rates

A total of 119 candidates were enrolled this semester.

Two candidates withdrew from the subject. An additional two candidates submitted an assignment but did not present at the exam. The headline pass rate has been adjusted to remove these four candidates.

It is proposed that 67 candidates be awarded a pass, which implies a pass rate of 58.3%.



Assessment Committee Report

Semester 1 2022

Table 1 – Subject results

Assessment	Attempted	Passed	Pass rate
Assignment	117	94	80.3%
Exam	115	52	45.2%
Total	115	67	58.3%

Figure 1 – Marks per assessment

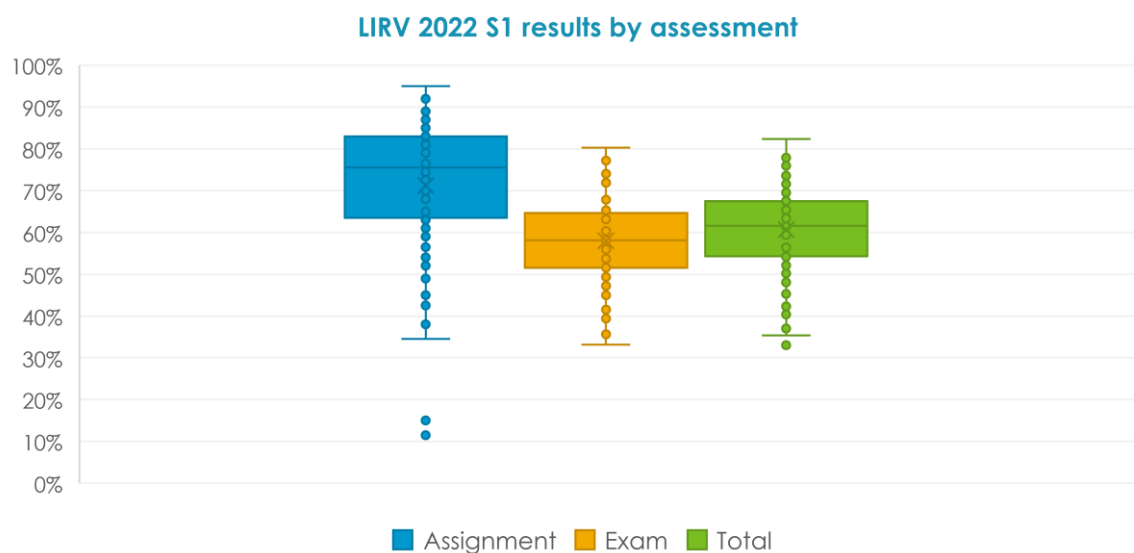


Table 2 - Historical results

Semester	Attempted	Passed	Pass Rate
Semester 1 2022	115	67	58%
Semester 1 2021	101	58	57%
Semester 2 2020	108	62	57%
Semester 1 2019	68	19	28%

A pass rate of 58% is aligned with historical results and the principle that a well-prepared student should be able to pass the subject.



2. Assessment

2.1. Assignment

The main purpose of the assignment was to help candidates develop the skills set out in Section 2.1 Subject overview.

More specifically, the Life Insurance and Retirement Valuations assignment for semester 1 2022 was set in a made-up country, XLand. The life company, REV Life is privately owned and sells stepped premium yearly renewable term death cover.

REV Life is closed to new business and had no reinsurance.

The main topic assessed is embedded value in the context of replying to questions from a shareholder of REV Life.

The assignment comprised 4 parts as summarized in the table below:

Question	Marks	Command verb (learning outcome)	Overview of what the question tests
1 a	5	Describe (K)	Understanding of the reported balance sheet and embedded value balance sheet
b	5	Describe (K)	Understanding of how assumptions for EV and reporting differ
c	10	Explain (A)	Ability to apply understanding of factors which drive movement in EV versus profit
2	50	Prepare (HO)	Ability to prepare an analysis of change in EV and produce a waterfall chart allowing for experience variations and assumptions change
3	25	Analyse (A)	Ability to apply knowledge of tier 2 subordinated debt and EV to analyse the impact of its issuance
	5	Report Writing(K)	Knowledge of how to write a report and communicate effective the target audience

The learning objectives assessed in this assignment are shown below.



Table 3 – Assignment learning objectives

Question	Syllabus learning objectives	Modules	Total marks	K (25%)	A (50%)	H (25%)
1 a b c	5.1, 5.3, 13.2 5.1, 5.3, 13.8 13.2, 13.3, 13.8	Describe (K) Describe (K) Explain (A)	5 5 10	5 5	10	
2	1.3, 4.1, 4.3, 4.5, 4.7, 5.5, 7.5, 9.6, 11.5, 11.6, 13.6	Prepare (HO)	50	10 ¹	30	10 ²
3	11.2, 11.3, 11.6	Analyse (A)	25	5 ³	15	5 ⁴
Report writing	1.4, 9.7, 13.6, 13.9	(K)	5	5		
		Total	100	30	55	15

2.2. Exam

The exam paper comprised four questions worth 20 marks each.

A summary of the questions is shown in Table 4.

¹¹ documentation and checks and controls

² commentary

³ Documentation and checks and controls

⁴ commentary



Table 4 – Summary of S1 2022 exam questions

Question	Marks	Summary
1	20	Question 1 tests students' understanding of core concepts such as presentation of policy liabilities on the balance sheet; relationship between net assets and the capital base; use of model point versus individual policy data; and checks relating to accurate and completeness.
2	20	Question 2 applies a fundamental principle underpinning the valuations subject – that the purpose of the valuation drives the data, methodology, assumptions and model. Candidates are required to apply this statement to the valuing of liabilities for different purposes.
3	20	Question 3 tests another core principle covered in the subject – how the valuation basis impacts the emergence of profit. Candidates also need to consider the impact of a change in an assumption on a different valuation basis.
4	20	Question 4 covers analysis of surplus. There are two parts to this question with most marks allocated to examining candidates' ability to think through the impact of the timing of implementing an assumption change on various components of an analysis of profit.

The learning objectives assessed in this exam are shown in Table 5,

Table 5 – Exam learning objectives

Question	Syllabus Learning Objective	Module	Page Reference in Course Notes	Total Marks	K 25%	A 50%	H 25%
Q1a	6	M7	7.1, 7.3	5	5		
Q1b	11.6	M12	12.4.1	5		5	
Q1c	9.2	M10	10.4.3	5		5	



Assessment Committee Report

Semester 1 2022

Question	Syllabus Learning Objective	Module	Page Reference in Course Notes	Total Marks	K 25%	A 50%	H 25%
Q1d	9.3	M10	10.4.3, 10.5	5	5		
Q2a	3.2, 4.1	M4, M5	5.1, 12.2.1	4	4		
Q2b	1.3, 2.1, 4.1, 4.2, 4.3, 7.2, 8.1, 8.2, 9.3, 11.2	M2, M3, M5, M8, M9, M10, M12		16		16	
Q3a	4.1, 5.1, 5.2, 5.5	M5, M6		11		11	
Q3b	4.1, 5.1, 5.2, 5.5, 7.5	M5, M6, M8		9			9
Q4a	12.1	M13	13.1.1	4	4		
			13.1.3				
Q4b	12.2, 12.3	M13	13.1.1	16			16
Total				80	18	37	25
				23%	23%	46%	31%

K – Knowledge 25%

A – Application 50%

H – Higher order/ Judgement/Evaluation 25%

3. Results by assessment component

3.1. Assignment

Overall, candidates performed well on the assignment with a pass rate of 81% with an average score of 71% (above pass level).

A summary of the results are presented in the following table.



Table 6 – Results by assignment grading

Grade	Number	Percentage	Average
Significantly above pass level	38	33%	85.1
Above pass level	35	30%	75.3
Pass level	21	18%	65.1
Below pass level	18	16%	52.4
Significantly below pass	5	4%	27.7
Grand Total	117		71.1

This assignment was challenging for candidates as it tested embedded value which is the last module in the course. The fact that 63% of candidates scored above 70% is a very good result given the difficulty of the task.

The following observations were made about candidates who scored significantly above pass:

- their scores ranged between 80% and 95%;
- these candidates consistently scored at an above pass or significantly above pass level on modelling analysis of change in EV. This part was worth 35% and so was a key driver of their result;
- their performance on modelling the impact of issuing subordinated debt on EV was variable with results ranging from below pass through to significantly above pass. This component was worth 12.5%; and
- these candidates performed at an at least pass level on the commentary components related to modelling which were worth 15% in total.

The following observations were made about candidates who scored significantly below pass:

- modelling skills differentiated these candidates as they scored at significantly below pass or below pass level for both modelling questions (movement in EV and impact of subordinated debt);
- while some parts of their submissions were at a pass or above pass level, overall, they did not pass several parts of the assignment which verified they are not at a pass standard.



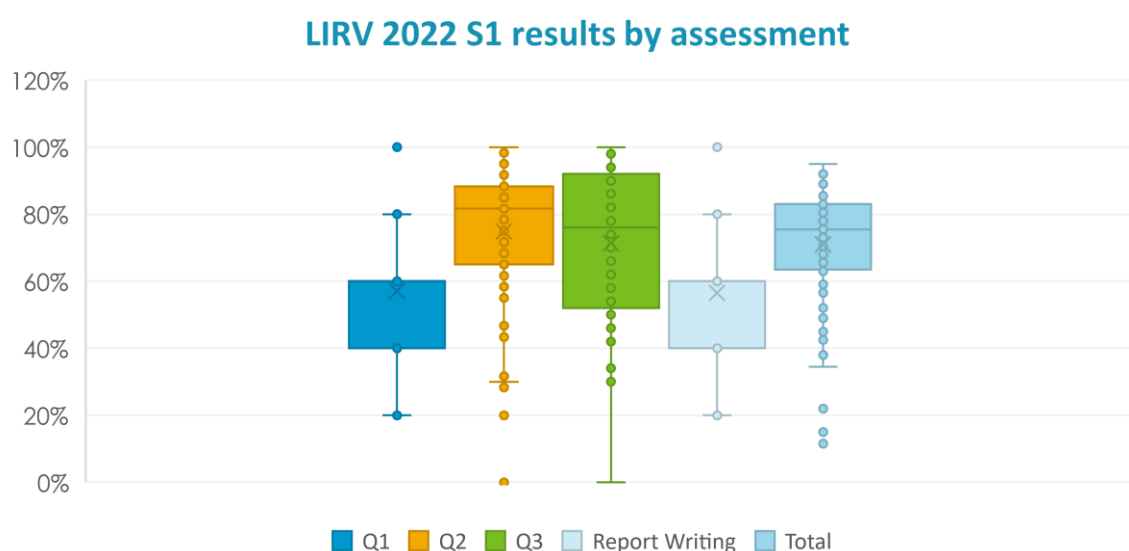
Assessment Committee Report

Semester 1 2022

Each part of the assignment was marked out of 5, in line with the rubric grading. For example, a candidate who achieved a “pass” standard for Q1 was awarded a 3 out of 5 and this contributed 10% towards their overall grade for the assignment.

The figure and table below provide the results by question.

Figure 2 – Marks per assignment question



Question	1	2	2	2	2	2	3	3	3	3	3	Report Writing	Total
Sub part		(i)	(ii)	(iii)	(iv)	(v)	(i)	(ii)	(iii)	(iv)	(v)		
Weighting	10%	5%	35%	5%	5%	10%	3%	13%	3%	3%	5%	5%	100%
Average	2.8	3.7	3.8	3.7	3.6	3.6	4.2	3.5	4.0	3.3	3.2	2.8	3.5
Min	1	1	1	1	1	1	0	0	0	0	0	1	1
Max	5	5	5	5	5	5	5	5	5	5	5	5	5

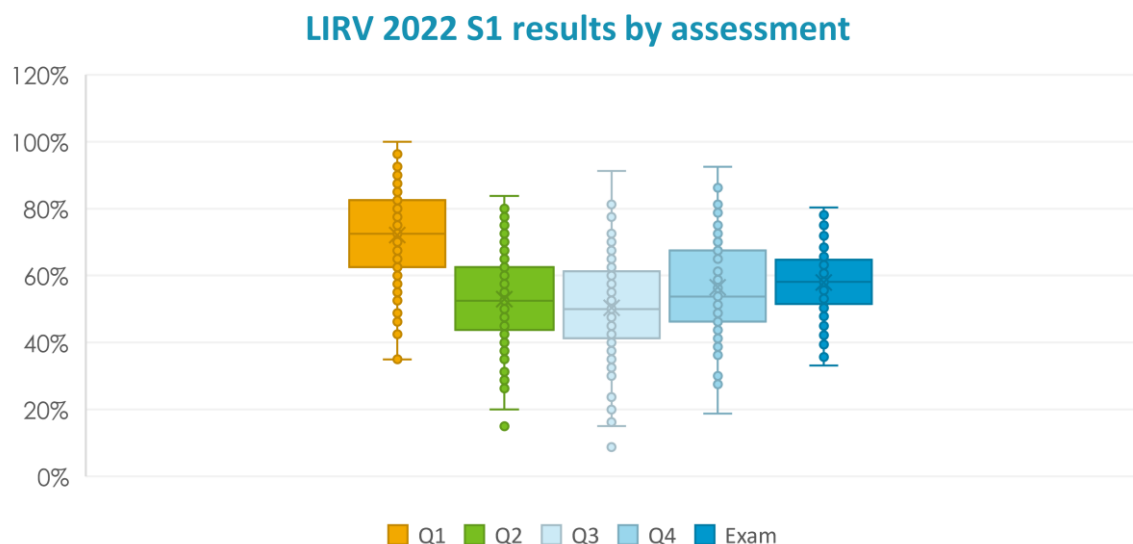
(i) Assumptions, (ii) Modellings, (iii) Documentation, (iv) Checks and controls, (v) Commentary

On average candidates performed between a pass to above pass level for the technical questions and at a below pass level on report writing and general commentary about the relationship between EV and reported profit.



3.2. Exam

Figure 3 – Marks per exam question



Question 1

Candidates performed well on Question 1 with an average score of 72%. A total of 91 candidates (79%) scored 60% or greater.

Question 1 tested concepts relating to the calculation of policy liabilities and presentation in the financial statements.

Marking was segmented into five parts, as represented in the table below.

	a(i)	a(ii)	b	c(i)	c(ii)	d	Total
Total	2.0	2.0	5.0	2.0	2.0	7.0	20.0
Average	66%	47%	83%	81%	57%	75%	72%
Maximum	100%	94%	100%	100%	100%	100%	95%
Minimum	13%	13%	20%	0%	0%	36%	44%

Part a) required candidates to describe how gross and reinsured policy liabilities appear on the balance sheet. Weaker candidates did not identify that reinsured policy liabilities are an asset on the balance sheet despite this being covered in the modules.



Part b) required candidates to explain the relationship between the capital base and net assets. Weaker candidates were not able to explain the difference and missed easy marks by not defining terms.

The concept of grouped “model” points was covered in part c) as candidates needed to explain reasons why they may be used instead of individual policy data for life insurers and reinsurers. Few candidates could provide multiple reasons from the perspective of a reinsurer.

Lastly, for part d) candidates needed to outline checks that could be performed to ensure reported policy liabilities are accurate. The answer to this question could be sourced from the modules but the importance of this knowledge should not be understated. Stronger candidates explained the checks and provided examples such as reconciling be different data sources.

Question 2

Question 2 was challenging for candidates with an average score of 53%. Only 39 candidates (34%) scored 60% or greater.

	a	b(1)	b(2)	b(3)	b(4)	Total
Total	4.0	4.0	4.0	4.0	4.0	20.0
Average	71%	49%	45%	58%	42%	53%
Max	100%	88%	91%	97%	97%	81%
Min	25%	0%	6%	6%	0%	21%

This question tested a core concept that runs through the subject – the purpose of the valuation drives the data, method, assumptions and model.

Weaker candidates could not differentiate between the different reporting types in respect to purpose. Without grasping this concept, it was difficult for candidates to answer part b).

Explaining how data, method, and model vary depending on the purpose was poorly answered by candidates. Weaker candidates copy pasted the same information for each reporting approach despite the question clearly stating that candidate needed to differentiate. This is disappointing given the distinction should have been clear to candidates who were familiar with the content of the modules.

Candidates were strongest at explaining how purpose drives the assumption basis. Most candidates were able to identify differences between financial and capital reporting in respect to assumptions used.



There was confusion amongst some candidates as to the difference between method, basis and model which again is surprising given the concepts are covered clearly in the course.

Question 3

Question 3 was the most challenging question on the paper for candidates with an average score of 50%. Only 34 candidates (29%) scored 60% or greater.

	(a)(i)	(a)(ii)	(a)(iii)	(b)	Total
Total	3.0	4.0	4.0	9.0	20.0
Average	83%	60%	54%	33%	50%
Max	100%	100%	97%	83%	87%
Min	8%	19%	3%	0%	13%

Part a) tested candidates' ability to work through how profit emerges for the three valuation approaches covered in the modules. While many candidates could describe in theory how profit emerges, stronger candidates linked this back to the product in question – disability income insurance. Only a few candidates considered implications of a margin for adverse deviation on incidence and termination rates and very few discussed claims in the course of payments.

Part b) required candidates to work through how a reduction in discount rates impacts operating profit for the valuation approached covered in part a). Marks were available for candidates who considered both the asset and liability side the balance sheet and relationship with the profit and loss statement. Few candidates did this. This was challenging for candidates. Several candidates focused on inception which means they misinterpreted the question. Markers awarded marks for points that demonstrated knowledge of concepts covered in the marking guide. Unfortunately, many candidates did not consider if the policy liability was positive or negative and hence whether profit would increase or decrease when discounted at a lower rate. This part demonstrates the fact that candidates need to work on their application skills as we would expect candidates studying this subject to be able to work through a problem such as an assumption change.

Question 4

Candidates performed reasonably on Question 4 with an average score of 57%. A total of 44 candidates (38%) scored 60% or greater.



	(a)	b(1)	b(2)	b(3)	b(4)	Total
Total	4.0	4.0	4.0	4.0	4.0	20.0
Average	95%	54%	51%	49%	34%	57%
Max	100%	100%	100%	100%	88%	87%
Min	63%	6%	6%	0%	0%	28%

Part a) required candidates to discuss the benefits and limitations of an analysis of surplus. This was a straight-forward question that drew on candidates' knowledge of the content in the modules.

Part b) required candidates to work through the impact of strengthening the assumption basis and higher than expected new business volumes on component of an analysis of surplus if the changes were implemented at the beginning of the year versus the end of the year. Marking was split up into the four components – investment returns on opening surplus (b1), expected surplus b(2), experience surplus (b3) and other changes in experience (b4). However, markers were instructed not to cap any component at four marks.

Part b) was generally answered quite poorly by candidates. Stronger candidates were able to define the scenario and assumptions used before they answered the question as this helped to set the framework for their answer. Surprisingly, most candidates did not identify that the impact on expected surplus depends on the local accounting rules. Candidates need to remember that unless specified otherwise, this subject is jurisdiction neutral. Most candidates could explain that strengthening the claims basis at the beginning of the year would reduce the experience loss over the period.

END



LIA: LIFE INSURANCE APPLICATIONS

1. Summary

1.1. Course Overview

The aim of this subject is to provide students with an understanding of how a life insurance company operates in Australia and the legal, regulatory, and professional framework that governs the industry. This is now the only Fellowship subject that examines the specifics of the Australian legal and regulatory framework for Life Insurance in Australia.

There are four cycles where actuaries have a core function when advising the business: product management; valuation; risk management; and business planning. In each cycle the actuary is required to understand the problem, develop a solution, and monitor outcomes. This course aims to equip students with the tools to perform these functions for an Australian life insurance company.

After successful completion of this subject, students will be able to:

- describe the commercial, legislative, regulatory and professional environments that apply to Australian life insurers;
- describe and apply the actuarial control cycle to product management, valuations, risk management and business planning for business sold by life insurers operating in Australia;
- prepare components of key inputs used in, or outputs produced, as part of product management, valuations, risk management or business planning for life insurers working in Australia;
- evaluate components of key outcomes from product management, valuations, risk management or business planning processes for life insurers operating in Australia;
- understand how product management, valuations, risk management and business planning processes interact; and
- describe and apply the prudential requirements of actuarial advice within a life insurer operating in Australia.

1.2. Assessment

Assessment for this subject was comprised of the following parts:

- assignment (20 % weighting); and
- exam (80% weighting)



1.3. Pass Rates

A total of 57 candidates were enrolled in the Life Insurance Applications subject in semester 1, 2022.

All candidates submitted an assignment and presented at the exam.

Table 1 – Subject results

Assessment	Attempted	Passed	Pass rate
Assignment	57	52	91%
Exam	57	25	44%
Total	57	30	52.6%

Figure 1 – Marks per assessment

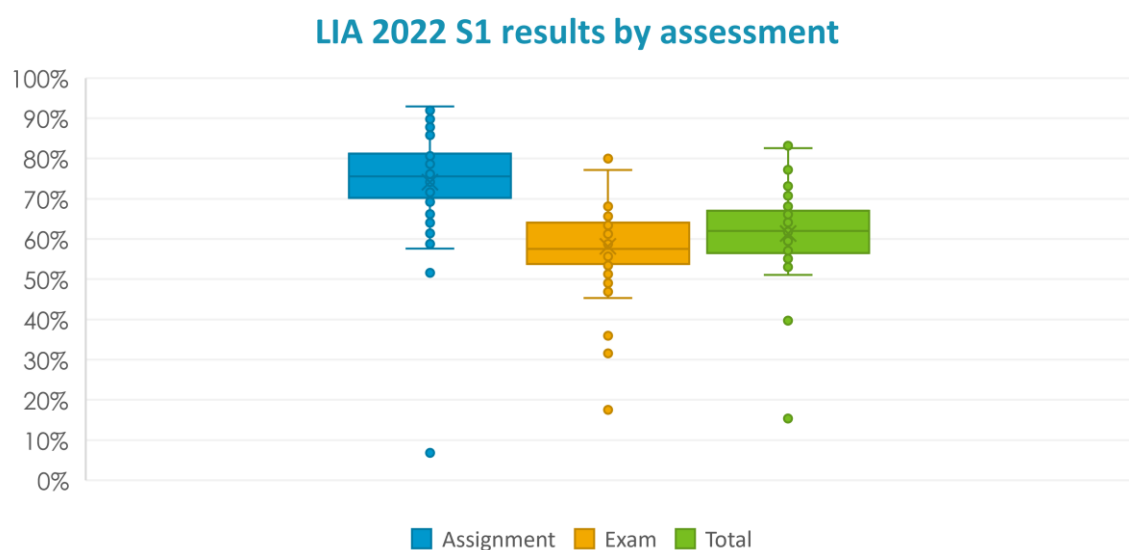




Table 2 – Historical results

Semester	Attempted	Passed	Pass Rate
Semester 1 2022	57	30	53%
Semester 2 2021	31	20	65%
Semester 1 2021	47	26	55%
Semester 2 2020	31	17	55%

The pass rate of 53% for this semester is broadly aligned with historical pass rates. It is aligned with the principle that *a well-prepared student should be able to pass the subject*.

2. Assessment

2.1. Assignment

The main purpose of the assignment was to develop and assess the skills set out in Section 2.1 Subject Overview. These are the learning outcomes for this subject.

The Life Insurance Applications assignment for semester 1 2022 was set in Australia based on "LIA" a shareholder owned Australian life insurer that sells YRT and TPD.

In the assignment, LIA is described as being owned by an overseas parent that does not have appetite to inject capital and has been adversely impacted by COVID-19.

LIA is looking into introducing a new product with death and TPD where the TPD benefit is a full acceleration of the death benefit.

Candidates were required to compare two reinsurance quotes against an option of retaining the business.

The assignment tested understanding of calculation of policy liabilities gross and net of reinsurance; calculation of insurance risk and asset concentration risk capital; and the impact of COVID-19 on risk margins.

The assignment comprised 4 parts as summarized in the table below:



Table 3 – Overview of the assignment questions

Question	Marks	Command verb (learning outcome)	Overview of what the question tests
1	5	Discuss (K)	Understanding of how reinsurance is used to manage insurance risk
2a, b, c	60	Calculate (A)	Ability to use information provided and make assumptions in order to calculate - net of reinsurance policy liabilities in accordance with LPS 340 for the two reinsurance quotes versus retaining the business; - the insurance risk capital charge; and - asset concentration risk capital charge.
3	15	Evaluate (HO)	Ability to perform scenario analysis with reference to the impact of COVID-19 on stress margins.
4	10	Propose (HO)	Ability to provide and justify a recommendation between the two reinsurance quotes and retaining the business.
	10	Report writing	

The learning objectives assessed in the assignment are shown in the table below.

Table 4 – Assignment learning objectives

Question	Syllabus learning objectives	Modules	Total marks	K (20%)	A (50%)	H (30%)
1	6.3, 6.9, 6.13, 7.5, 8.7		5	5		
2a	4.1, 7.3, 7.4, 7.6,		25		60	
2b	4.1, 7.5, 7.6		25			
2c	4.1, 7.5		10			
3	1.1, 4.1, 5.1, 5.2, 7.5		15			15
4	5.1, 5.2, 6.6, 6.9, 6.13, 7.12,		10			10
Report writing	4.1, 5.2, 6.6,		10	10		
			100	15	60	25

2.2. Exam

The exam paper comprised four questions worth 20 marks each.

A summary of the questions is shown in the table below.



Table 5 – Summary of S1 2022 exam questions

Question	Marks	Summary
1	20	Question 1 relates to meeting customers' needs. This question covers the legislative and regulatory framework that protects customers and how this applies to accidental death business with a loss ratio between 15-17%.
2	20	Question 2 covers regulatory adjustments to net assets to determine the capital base. Candidates are required to demonstrate using a simple numerical example were the difference between the adjusted policy liabilities and the "accounting" policy liabilities may be positive or negative.
3	20	Question 3 tests candidates' understanding and application of Your Future, Your Super and stapling members to their existing superannuation plan. Candidates need to consider how to remove occupational exclusions for group insurance.
4	20	Question 4 tests understanding of APRA's prudential requirements in the content of current market conditions. More specifically, candidates need to demonstrate an understanding of APRA's minimum capital requirements by distinguishing between solvency and capital adequacy. Candidates also needed to show understanding of the limitations of APRA's real interest rate stress shock in a low interest rate environment. Lastly, candidates need to consider how to manage the value of investment account liabilities to be within 95% to 103% of the value of supporting assets during times of market volatility.

The learning objectives assessed in this exam are shown in the following table.



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Table 6 – Exam learning objectives

Question	Syllabus Learning Objective	Module	Page Reference in Course Notes	Total Marks	K 20%	A 50%	H 30%
Q1a	1.1, 1.6,	M2	3.3.4	8	8		
	2.1	M3	3.4.4				
	4.2	M4	4.3.2				
Q1b	1.1	M2	3.3.4	4	4		
	2.1	M3	RF 274				
	4.1, 4.2	M4	4.1.2				
Q1c (i) (ii)	1.1, 1.6,	M2	REP 587	4		4	
	4.2,	M4	4.3.3	2			2
	(iii)	M6	6.8.1, 6.8.2, 6.9.2	2			2
Q2a	4.2	M4	LPS 110, LPS 112	4		4	
Q2b	4.1	M4, M7	7.5.3	4		4	
	7.4, 7.5		LPS 112				
Q2c	4.1	M4, M7	Tutorials	12			12
	7.4, 7.5		LPS 112 7.5.3 3.4.7				
Q3a	1.1, 2.1, 5.1	M2, M3, M5	FSC Policy Consultation Paper	3	3		
Q3b	1.1, 2.1	M2, M3	Tutorials 6.8.1	3		3	
Q3c	1.1, 2.1, 4.2, 6.8, 6.9, 6.12	M2, M3, M4, M6	FSC Policy Consultation Paper	6		6	
Q3d	1.1, 6.8, 6.12	M6	6.8.1, 6.8.2, 6.12	8		8	
Q4a	4.1	M4	LPS 100	4	4		
			LPS 110				
Q4b	4.1, 7.5	M4, M7	LPS 114	6		6	



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Question	Syllabus Learning Objective	Module	Page Reference in Course Notes	Total Marks	K 20%	A 50%	H 30%
APRA's IFRS 17 discussion paper Tutorials 7.5							
Q4c	2.1, 4.1, 6.18, 8.3	M3, M4, M6, M8	The Life Act LPS 600	10			10
Total					19 24%	35 44%	26 33%

3. Results by assessment component

3.1. Assignment

Overall, candidates performed well on the assignment with a pass rate of 91% with an average score of 74% (above pass level).

A summary of the results is presented in the following table:

Table 7 – Results by assignment grading

Grade	Number	Percentage	Average
Significantly above pass level	16	28.1%	86.5
Above pass level	27	47.4%	75.1
Pass level	9	15.8%	64.2
Below pass level	4	7.0%	56.9
Significantly below pass	1	1.8%	6.8
Grand Total	57		74.1

We expect candidates to pass the assignment and for a high proportion to perform well because they are not time pressured when working on their submissions. We also expect that candidates will closely follow the directions we provide in the rubric.



The following observations were made about candidates who scored significantly above pass:

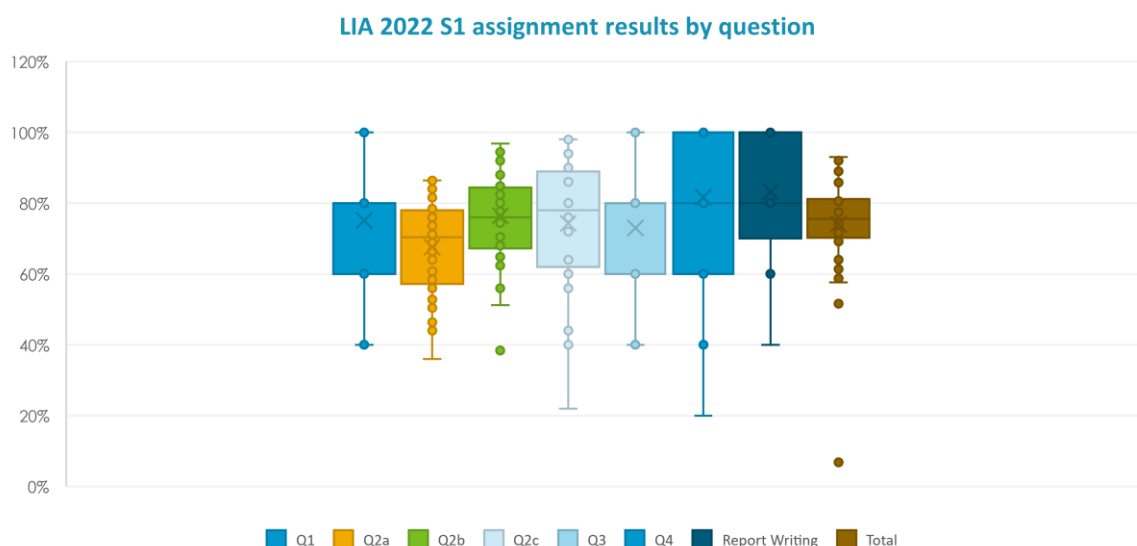
- their scores ranged between 80.6% to 93.0%;
- there were only a few instances where one of these candidates scored below pass on a part of the assessment although these parts had a small weighting;
- all candidates were at a pass or above pass level for modelling policy liabilities;
- all candidates were at an above pass or significantly above pass level for modelling capital;
- a total of 13 out of 16 scored significantly above pass level for report writing;

The following observations were made about candidates who scored at a below pass standard:

- All 4 candidates were at a pass level for modelling policy liabilities and 3 out of 4 were at a pass level for modelling capital. This is encouraging as it shows they can meet expectations for modelling for the Life Insurance Applications subject.
- The reasons these 4 candidates scored at a below pass level varied
 - 3 out of 4 of these candidates performed at a below pass level on the question covering the impact of COVID; and
 - 2 out of 4 candidates were at a below pass level for their recommendation.
- All four of these candidates were at a pass level for report writing.

The following figure and table provided the results by question.

Figure 2 – Marks per assignment question





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Question	1	2a	2a	2a	2a	2b	2b	2b	2b	2c	2c	2c	2c	3	4	Report writing	Total
Sub part		(i)	(ii)	(iii)	(iv)	(i)	(ii)	(iii)	(iv)	(i)	(ii)	(iii)	(iv)				
Weighting	5%	5%	15%	3%	2%	5%	15%	3%	2%	1%	7%	1%	1%	15%	10%	10%	100%
Average	3.8	3.1	3.4	3.9	3.2	4.1	3.9	3.5	3.2	3.6	3.8	3.8	3.0	3.6	4.1	4.2	3.7
Min	2.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0	1.0	1.0	2.0	1.0	2.0	1.0	2.0	1
Max	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5

(i) Assumptions, (ii) Modelling, (iii) Documentation, (iv) Checks and controls

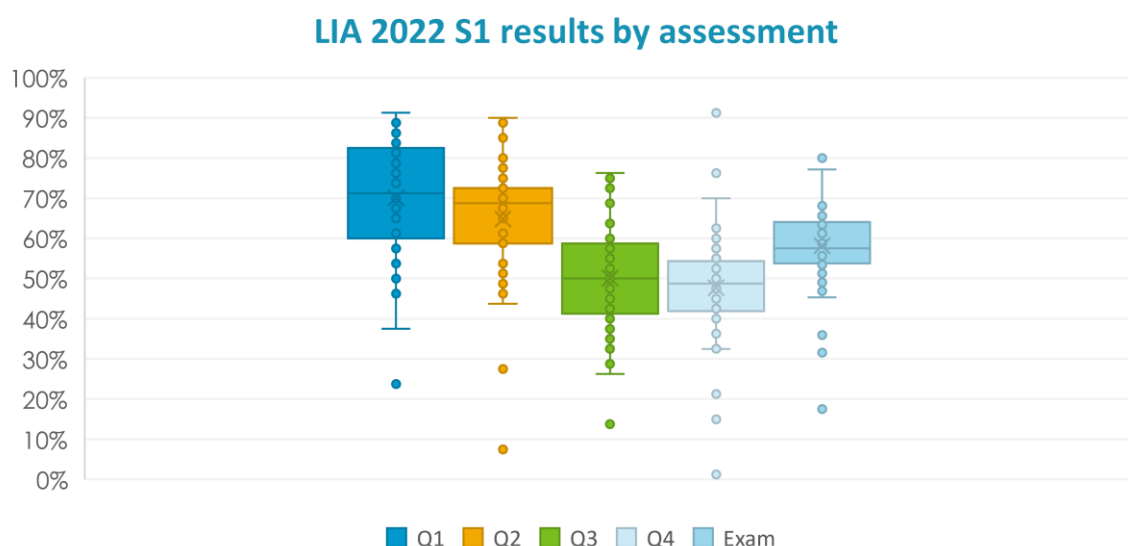
Each part of the assignment was marked out of 5, in line with the rubric grading. For example, a candidate who achieved a “pass” standard for Q1 was awarded a 3 out of 5 and this contributed 10% towards their overall grade.

Key observations from this table:

- on average, candidates performed between a pass to above pass level for all parts of the assessment;
- the strongest areas, on average, were recommendations and report writing;
- it is encouraging to see that the “average” candidate is an at least pass level on assumption setting, modelling, documentation, and checks and controls.

3.2. Exam

Figure 3 – Marks per exam question





Question 1

Candidates performed well on Question 1 with an average score of 70%. A total of 43 candidates (75%) scored 60% or greater.

Question 1 tested the concept of meeting customers' needs. Marking was segmented into five parts, as represented in the table below.

Table 8 – Segmented results for question 1

	(a)	(b)	c(i)	c(ii)	c(iii)	Total
Total	8	4	4	2	2	20
Average	76%	73%	52%	65%	81%	70%
Maximum	100%	100%	100%	100%	100%	91%
Minimum	16%	13%	13%	25%	0%	24%

In part a) candidates were asked to describe how legislation in Australia helps to ensure customer needs are met. Candidates were expected to cover Design and Distribution Obligations, Financial Services Reform Act and Future of Financial Advice amendments to the Corporations Act. They were also expected to consider the Life Act and were awarded marks for other relevant legislation, such as the Disability Discrimination Act.

Feedback from the markers was that not many candidates covered all legislation. Weaker candidates copied directly from the modules and so did not use concise language. This made it harder for markers to identify relevant points. Candidates who mentioned other legislation, not in the marking guide, such as Financial Sector (Collection of Data) Act were also awarded marks.

For part b) candidates had to describe actions that regulators can take if they are concerned a life product is not meeting customers' needs. This part was generally answered well with most candidates including points about both APRA and ASIC. Few candidates mentioned the ACCC or AFCA. The ability of both APRA and ASIC to undertake conduct market reviews was mentioned frequently. Weaker candidates tended to focus on listing the industry reviews that have been undertaken rather than discussing the action that regulators can take.

Part c) was split into three parts and required candidates to consider reasons for a loss ratio of 15-17% for accidental death business; whether the product was meeting customer needs; and recommend action to be taken. This part differentiated candidates as it required them to think through a new problem and apply principles relating to pricing and treating customers fairly. The basis for the question was ASIC's findings in Report 587 *The sale of direct life insurance*.



Stronger candidates identified this and referred to comments made in this report as part of their answer.

Weaker candidates assumed the product was earning high profits and in doing so did not discuss the expense element of premiums. This was an important consideration and weighting was given to a discussion of expenses in the marking guide.

Weaker candidates also recommended reducing premium rates without any qualification around profit testing and adequacy that should form part of providing CPS 320 advice.

Question 2

Candidates also performed well on Question 1 with an average score of 65%. A total of 42 candidates (74%) scored 60% or greater.

The question comprised three parts, although marking for part c was split, as represented in the table below.

Table 9 – Segmented results for question 2

	(a)	(b)	c(+ve)	c(-ve)	Total
Total	4	4	6	6	20
Average	76%	78%	64%	49%	65%
Maximum	100%	100%	100%	83%	90%
Minimum	38%	0%	0%	0%	8%

Question 2 parts a) and b) tested knowledge of APRA's prudential rules around regulatory and supervisory adjustments. These parts were well answered by candidates. Weaker candidates replicated points in both parts but were only awarded marks once. Weaker candidates also did not include enough points. Both issues can be addressed through better exam technique and ensuring more points are included than required to get full marks. Interestingly, few candidates mentioned that the supervisory adjustment is not publicly disclosed.

Part c) was more challenging and required candidates to explain and demonstrate a positive and negative regulatory adjustment to remove the present value of future profits from the capital base. The objective of this question was to test whether a candidate could clearly explain the purpose of this adjustment and demonstrate its outcome with some simple "made up" numbers.

Candidates who did not perform well on this part tended to recycle spreadsheets from the



course materials or included minimal commentary to support their numerical example. Therefore, they did not demonstrate that they understood what they were doing. Several candidates misinterpreted what a positive and negative adjustment is although markers did not penalise for this. Points that were commonly misunderstood include the addition of the illiquidity premium for annuities and the impact of discount rates on the relative value of the risk-free best estimate liability (RFBEL) and the best estimate liability (BEL).

Question 3

Question 3 was more challenging for candidates with an average score of 50%. Only 12 (21%) of candidates scored 60% or above.

The question comprised four parts, as represented in the table below.

Table 10 – Segmented results for question 3

	(a)	(b)	(c)	(d)	Total
Total	3	3	6	8	20
Average	55%	65%	52%	41%	50%
Maximum	83%	100%	83%	81%	76%
Minimum	25%	0%	13%	9%	14%

For part a) candidates needed to identify the benefit of stapling and for part b) they needed to propose an example of how it may lead to a poor insurance outcome for young members. Most candidates could identify that stapling helps with avoiding multiple accounts leading to multiple fees and erosion of the account balance. Many candidates were confused around the interaction between stapling and Putting Members' Interests First. To score well on part b) candidates needed to identify that if a member was insured in a white-collar fund (by opting in or other means) then they may not be able to claim if their occupation changes from white collar to blue collar.

While part c) may have appeared like a straightforward question testing a candidate's ability to link occupation to product design, underwriting and claims management, it was challenging for candidates as they had to focus on key points meaning they could differentiate the application for individual and group death cover.

Lastly, part d) required candidates to problem solve the implications of removal of a dangerous occupation exclusion for group insurance. Candidates were expected to think broadly about the issue rather than going deep into one aspect. The marking guide has a generous array of



points on a range of considerations. However, several candidates took a narrower focus by focusing on the data aspect. The markers awarded points for comments outside of the marking guide relating to loss ratios, capital requirements, risk appetite and the risk management framework. The fact that candidates had difficulty thinking about a framework to solve the problem, along with key aspects of group pricing – a prior and a posterior assumption – is reflected in the average for part d) being below 50%.

Question 4

Question 4 was the most challenging for candidates with an average score of 48%. Only 10 (17%) of candidates scored 60% or above.

The question comprised three parts, as represented in the table below.

Table 11 – Segmented results for question 4

	(a)	(b)	(c)	Total
Total	4	6	10	20
Average	61%	57%	37%	48%
Maximum	100%	100%	95%	91%
Minimum	0%	4%	0%	1%

Part a) tested awareness that APRA differentiates between its minimum solvency and capital adequacy requirements. It was disappointing that some candidates were not even aware of APRA's prudential standard LPS 100. Clear guidance was given to candidates through tutorials and the discussion forum that capital standards were examinable this semester.

Candidates who were aware of current issues in the industry and had reviewed APRA's Discussion Note on AASB-17 were rewarded through part b). However, candidates did not need to have reviewed this Discussion Note to answer the question.

Part b) tested understanding the reasons why APRA is proposing including a floor to its real interest rate shock. Stronger candidates articulated how the current shock can lead to inappropriate stress margins when interest rates are low or negative and included a numerical example to demonstrate. Weaker candidates focused on the possibility of interest rates rising in the future.

The final part of this question was very challenging for candidates. It required them to explain how they would manage investment account liabilities to within 95 to 103% of assets when markets are volatile. This question differentiated candidates who could apply knowledge to a



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situation they had never seen before. To help prepare them for this, a guest speaker tutorial was run with James Purvis, who is the Chief Examiner for the Investments subject. Stronger candidates identified points around asset and liability management; changing the asset mix; using flexibility within crediting rate declarations and/or the investment fluctuation reserve; and the need to consider in the context of policyholder reasonable expectations. Surprisingly, very few candidates mentioned more frequent monitoring. If in doubt when answering an exam question, candidates should always consider reverting to the control cycle framework.

END



GIHV: GENERAL INSURANCE AND HEALTH VALUATIONS

1. Summary

1.1. Course Overview

GIHV is being run for the second time this semester. This subject aims to provide students with an understanding of how actuarial judgement (i.e. critical thinking) is required when considering the purpose of a valuation. Implications of different methods, models and assumptions are discussed through considering liability valuations and risk-based capital requirements. After successfully completing this subject, students will be able to:

- describe the various general and health insurance products, including the events that give rise to a claim, appropriate measures of exposure, the pattern over which the risk emerges and the basis for compensation;
- understand the various uses of insurance liability valuations and how they are relevant to profit and performance measures, capital adequacy assessments and management information;
- plan and produce appropriate methods, models, and parameters to value uncertain future cashflows whilst recognising data considerations; and
- identify key considerations when selecting a specific valuation procedure, understanding the merits of various options.

1.2. Assessment

Assessment for this subject is comprised of the following parts:

- assignment (20% weighting); and
- exam (80% weighting).

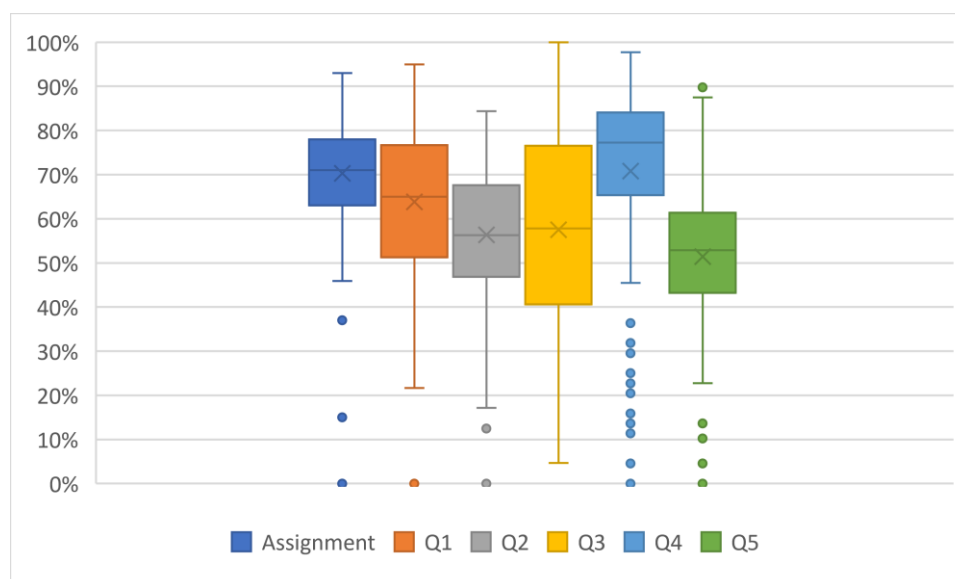


1.3. Pass Rates

Table 1 – Subject results

Assessment	Attempted	Passed	Pass rate
Assignment	171	147	86.0%
Exam	166	77	46.4%
Total	166	95	57.2%

Figure 6 – Marks per assessment



All questions were understood by the majority of candidates. Additional checks had been put in place this semester to reduce the probability of questions in the exam being open to misinterpretation. Exam timing appeared to not have been an issue for most candidates.

Judging from the marks, questions appear to have been of broadly similar difficulty with the exception of Q4 in which most students did well but a number of students lost many marks for failing to derive reinsurance premiums and commission percentages for the surplus treaty. The spread of marks for each question was similar.



2. Assessment

2.1. Assignment

The main purpose of the assignment was for students to carry out the full valuation process from conducting research on the product coverages, analysis of valuation data on claims experience, implementation of six key valuation methods to discussion of appropriateness of valuation results.

The specific skills that were being developed and assessed in the assignment were:

- apply subject material in an unfamiliar context;
- plan a model;
- build and manipulate a spreadsheet model;
- determine appropriate assumptions;
- communicate relevant points in language appropriate to the audience, in a logical and coherent manner; and
- meet business standards for presentation of work, both spreadsheets and written materials.

The learning objectives assessed in this assignment are shown below.

Table 4 – Assignment learning objectives

Question	Learning objective	Module	Weight
1	2.1 Identify and explain the main coverage elements in general insurance, health insurance and statutory compensation schemes including the events which give rise to any entitlement	M03	10
2	6.2.3 Understand the data items that define the “shape” of claims data	M05	15
3	6.2.1 Distinguish between portfolios, groups and sub-groups of data, and why they may be investigated at different levels	M10	10
4a	6.1 List the full range of data that may be available in undertaking a claims valuation and their sources	M10	5
4b	7.1 List the full range of data that may be available in undertaking a claims valuation and their sources	M10	10
4c	6.2 Understand and distinguish between the various uses of data in the valuation process	M10	5



Question	Learning objective	Module	Weight
4d	8.1 Understand the logical framework and assumptions underlying the Basic Chain Ladder technique 8.6 Adapt the Chain Ladder technique to assess claims cost, accounting for the following techniques, and understand the circumstances under which they are applicable: • Average Payments (including Payments Per Claim Incurred, Payments Per Active Claim, Payments Per Claim Finalised and the operational time functionality); • Projected Case Estimate; and • Bornhuetter-Ferguson.	M05, M06	10
4e	8.8 Understand the limitations of the various actuarial valuation techniques, and describe the impact of these limitations on valuation results	M11	5
4f	8.7 Understand the limitations of the various actuarial valuation techniques, and describe the impact of these limitations on valuation results	M11	5
4g	8.10 Understand the limitations of the various actuarial valuation techniques, and describe the impact of these limitations on valuation results	M11	10
Style of report	Overall structure of the report facilitates ease of understanding. All sentences are complete and grammatical. All paragraphs deal with a single theme.		15

2.2. Exam

The main purpose of the exam was to ensure that students understood the key objectives of the course.

The learning objectives assessed in this exam are shown below.

Table 5 – Exam

Question	Syllabus Learning Objective	Page Reference in Course Notes	Total Marks	K	A	H
1a	2.1, 2.6	S3.4 of M3	6	6		
1b	2.4, 2.7, 8.7	S3.8 of M3, S11.6.4 of M11	3	1	2	
1c	2.4, 2.7, 8.7	S3.8 of M3, S11.6.4 of M11	3	1	2	

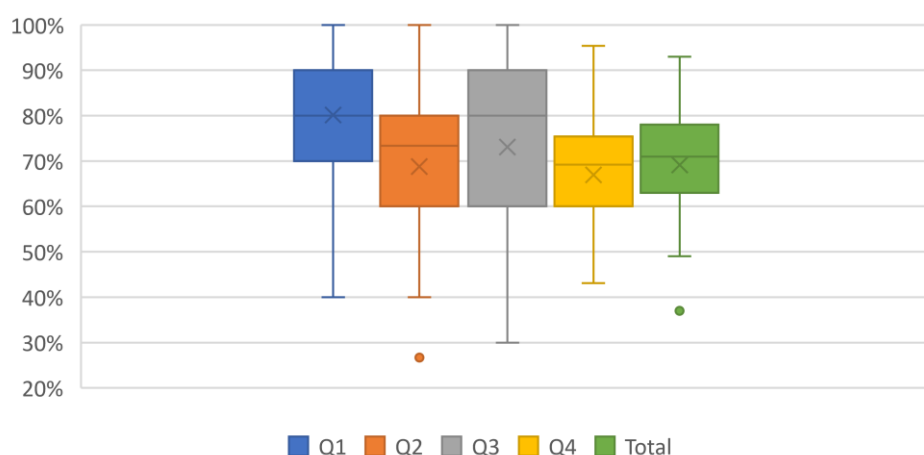


Question	Syllabus Learning Objective	Page Reference in Course Notes	Total Marks	K	A	H
1d	2.4, 2.7, 8.7	S3.8 of M3, S11.6.4 of M11	3	1	2	
2a	4.1, 11.3	S4.1.2 of M4, S8.2.6 of M8	6			6
2b	8.7, 8.8	S11.6 of M11	10		10	
3a	3.1	S8.2.2 of M11	2	2		
3b	11.8	S8.2.2 of M11	4			4
3c	3.1	S8.2.4 of M11	10		10	
4a	10.1	S9.4.3 of M9	6	6		
4b	10.1	S9.4 of M9	2	2		
4c	10.1	S9.4.3 of M9	3			3
5a	7.4	S12.5 of M12	8		8	
5b	13.6	S13.9.4 of M13	8		8	
5c	12.1	S14.2.1 of M14	6			6
Total			80	19	42	19

3. Results by assessment component

3.1. Assignment

Figure 7 – Marks per assignment question





We expect students to pass the assignment and for a high proportion to perform well because students are not time pressured when working on their submissions. We also expect that students will closely follow the directions we provide in the rubric.

The average student was able to:

- demonstrate their understanding of the insurance coverages;
- perform detailed analyses on the coverages' corresponding claims characteristics;
- correctly carry out technical work such as the six valuation methods;
- set reasonable valuation assumptions with justifications;
- construct valuation spreadsheets that are easy to follow and audit;
- build checks and balances to ensure data is reconciled and used correctly; and
- provide commentary on the reasonableness of the valuation outputs.

Students who performed well in this assignment:

- articulated the contrasting features of property and liability claims emergence patterns; and
- justified their advice on the outstanding claims liabilities having regard to the reasonableness of the outputs based on different valuation methods.

It was evident that students had thought a lot about the questions and performed detailed analysis. Stronger answers were able to summarise information and communicate their understanding clearly and concisely.

The following points are areas for improvements by the students:

- be concise in Q1 and demonstrate that findings from research have digested and summarised, instead of simply copying the policy wordings verbatim;
- in addressing the three aspects of claims characteristics in Q2, students need to consider and demonstrate recognitions of:
 - whether the claims patterns are of short or long-tailed in nature;
 - whether and from what development periods there are credible and reliable payment and case estimate development patterns; and
 - whether claims patterns exhibit volatility, seasonality or presence of large losses from one accident period to the next;
- be clear with the recommendations in Q3 with supporting evidence following the assessment;



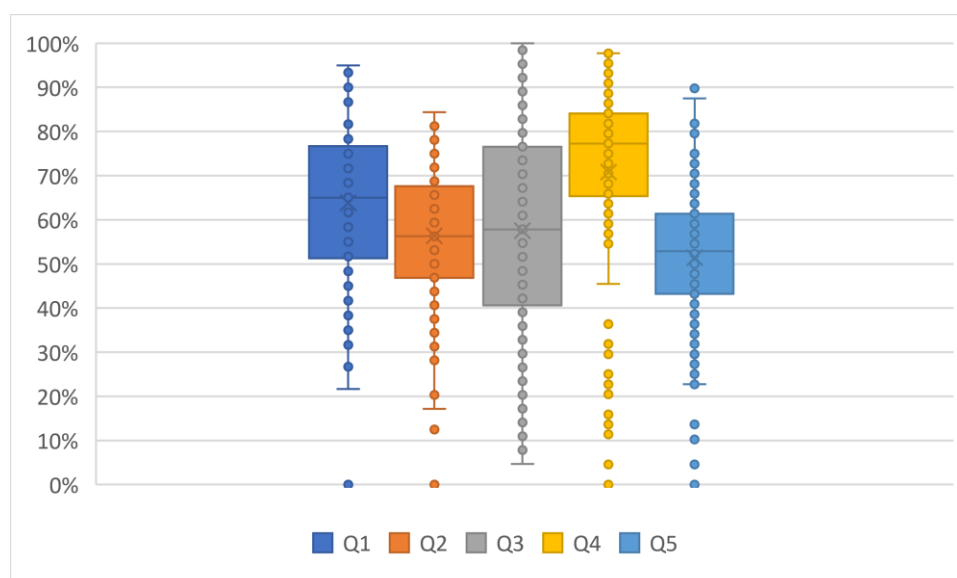
- be succinct in Q4 with the basic technical concepts in practice of writing valuation report and direct efforts to comparing the outputs based on different valuation methods and explaining the appropriateness of the recommended approach; and
- demonstrate that sense checks have been done on the valuation outputs to ensure they are reasonable and appropriate for use. This is in addition to ensuring that the mechanical calculations of the valuation methods have been correctly carried out.

The following are key learning points for students:

- revise what insurance coverages are considered to be for first party property damage, third party property damage and third party bodily injury;
- build checklist to look for key features of claims characteristics that warrant the application of one valuation method over the others e.g. is the portfolio short-tailed or long-tailed? Would BF method or PPCI method give the least biased or most accurate estimation of the results?
- build checklist to validate the appropriateness of the valuation approaches e.g. has smoothing been applied? Is tail factor needed? Is all historical valuation data predictive of future in terms of development pattern, impact of inflation etc.?

3.2. Exam

Figure 8 – Marks per exam question





For Q1, most students were able to approach question 1a as a book work question and attain full marks. There were a handful of students that did not read the full question and did not give one third party liability claim and property damage claim, instead giving two of each or other specific covers. Students did well to break the answer into components as required.

The part of the question that was done poorly was the limits and exclusion to policies especially liability covers. Brief answers that did not address the full scope of the cover were also not awarded full marks. Additionally, third party liability claims consist of death and injury, and property damage to a third party. A lot of candidates missed the property damage component.

The remaining three questions was assessing whether to split valuations based on different claim types. Overall, students were able to identify the different characteristics, but should expand on the 'so-what' and how this links to valuing them separately.

For Q1b, most students were able to identify the difference between short tail and long tail claims but not many were able to connect this to why this would require a separate valuation and explicitly connect to claim patterns/development pattern selections and different claim methodologies. Marks were given if candidates showed that these were connected even if not explicitly mentioned as many students did not make the connection at all.

For Q1c, most students struggled to identify the difference in seasonality and understand how annual and single policies translate to in terms of exposure and claims patterns. Some got confused with understanding what uniform exposure across the policy period meant. Many could identify the difference in underlying risk profile and marks were given here. Many did not connect the differences between the two to why the valuation should be conducted separately.

For Q1d, students were generally good in identifying the differences in the types of claims in terms of average claim size and frequency. Only a few students mentioned the stability in attritional claims patterns and the different valuation approaches for large and cat claims.

A good answer for the first one relied on book work and detailing the answer. Exclusion for liability and property damages well detailed and not vague or general. For the remaining three questions a good answer connected the properties of the underlying claims and risk to valuation methodologies.



Some students misunderstand exposure of policies, claims emergence patterns and what the valuation methodologies intend to capture when doing a valuation. Most students focused on reinsurance as a reason to conduct separate valuations not understanding that valuations can have the same assumptions and data can be separated to value different cohorts separately for reinsurance purposes.

For Q2a, students generally performed well. They generally understood what considerations are important for setting a valuation. Most students did well to write six specific questions ('are payments made as a lump sum or series of payments?') rather than writing a topic not in the format of a question ('basis of compensation').

Many students focused too much on the claims experience and asked questions which either did not relate to features of a product, or questions which a portfolio manager is not best suited to answer (for example, overly technical questions or questions that can be derived from the data).

A good answer prioritises its points focusing on the six most important questions. An average or poor answer provides too many or would list broad 'topics of conversations' to try to include multiple questions in the same 'point'.

A good answer either lists questions which are obviously useful for performing a valuation, or if it is unclear, they would ask a specific question and then provide a short description of how it is useful for the valuation. While this is not strictly necessary (the question only asks students to 'list' questions) and the markers did a best effort in interpreting why a student might ask a question, in cases where it was particularly unclear this helped the markers to understand.

A good student would generally ask *what* the product is.

It was not clear to some students what was meant by product features. In particular some students assumed their questions needed to directly relate to the data provided.

Some students asked specific questions, usually around claims experience/data, which would help them determine a valuation approach, rather than focus on product features.

Some students spent more time than necessary on each question justifying why they would ask their question. The question only asks for students to 'list' questions. Some justification/explanation can be useful if it's particularly unclear why a student has asked a question, but many questions are self-evident in their utility.

It is possible that some students may not understand the role of the portfolio manager.



For Q2b, there was a wide variety of quality in the answers from the students.

Students generally had a good understanding of the three methods, and many students were able to discuss when and why it is appropriate to use them. Many students made good, detailed observations around the data provided, and how this influenced their model choice.

Sometimes students dismissed models in their entirety based on something they observed, which then limited their model choice (e.g. they would decide case estimates were occasionally unstable, and hence not use PCE at all; when perhaps a partial weighting would be more appropriate).

A good answer was structured well. Often commentary would have a separate section for each accident year, and each section would make clear data observations relevant to that year. Examples include comments around reporting delay, case estimate development, finalisation rates and any abnormalities they noticed.

A good answer would give a proposed model blend or choice for each year, often later summarised in a table format. Importantly, students would make specific observations relating to specific development or accident periods and use that to justify their choice for that specific year.

An average or poor answer provided generic explanation for model choice or gave a textbook description of the different models. Generally these students would make non-specific comments which didn't tie directly to their decisions.

A good answer recognised unusual points in the data (e.g. nil case estimates when there was still open claims) and explained the implication on the valuation methods.

A good answer would include a decision for the 2018 accident year. While the outstanding claims estimate from all three models is nil, students were asked to make decisions for all years.

Some students calculated the final OCL based on their methods, which wasn't necessary.

Some answers dismissed PPCF method because it was 'too high compared to the other methods' or because the loss ratios were too high. While this might lead you to investigate further, there was not enough information available to conclude this means the values are wrong. Given the information available, students should probably focus more on whether the model is appropriate given the claims experience.



Some students thought that there was an error in PPCF OCL calculations because there was the exact same OCL for multiple quarters. This suggests a misunderstanding of how PPCF factors are selected or applied.

Many students seemed to think when case estimates are zero but the claim is not finalised that there was something wrong with case estimates, hence dismissing PCE. There were also students dismissing PPCF as 'overstating' the OCL when case estimates were 0. Without more data, the student shouldn't be assuming either scenario is certain.

Students need to give specific numeric percentages. Providing 'low/med/high' for each method is not proposing a blending percentage.

For Q3a, most students were able to copy from notes / materials. This meant full marks but not sure if many understood the concepts or when they elaborated past copying it from the notes, it showed that many confused the two.

For Q3b, the idea that many did not understand part a and just copied their answers from the notes was reiterated in this question. Many could not identify the unearned premium would not change – some identified that it would increase in future – so while this is true, I think they missed the point that the impact of the rate increases and poor loss ratio does not have an impact on the unearned premium booking at the valuation date.

This question was overall poorly done with many saying premium liability would not change but unearned premium would, even with full marks in part a.

Many did identify premium liability is likely to increase but very few identified the need to investigate the trends and whether this is going to continue into the future for already written policies.

Overall, the answers show poor understanding of the two and what drive their values. This was a great question to really differentiate students' understanding of the concepts.

For Q3c, many students scored full marks. Some small errors in application of discount. A handful of students re-earned the premium, and as such, this question was over-complicated by some. Some students did not spell out their workings so if the answer was not correct they did lose marks in sections where it could not be traced to what they did. Main marks lost were:

- discount applied to everything instead of just the claims component;
- not calculating/including refunds in the provisions (very common mistake); and



- given the notes have explicit calculations and examples, spelling out of each component in the question this question was easy marks.

For Q4a, students generally did very well in this question. A good answer writes the total premium, and the individual policy premiums, as an Excel table which had been inserted into the document. In general if students got the final answer wrong but some components right, the markers gave some points for this and it is easier to award these marks if the working is easy to follow.

For Q4b, students generally performed average. Students performed well in calculating the ceding percentage but often did not know how to calculate the reinsurance commission percentage. Students also often provided more information than was asked for (such as the recovery rate on the surplus insurance). Quite a number of students did not know how to calculate the reinsurance commission percentage. A common mistake was to calculate it as a percentage of the direct commission.

For Q4c, students generally performed well. They generally demonstrated an understanding of how surplus insurance works. Not all students recognised the importance of reinsurance for capital for a fast-growing insurance portfolio. A good answer mentioned the impact of reinsurance on capital, which is especially important for a growing company.

A good answer also said that surplus was particularly useful for a commercial property line because claims tend to be very large and are correlated to the sum insured. An average answer said that surplus was useful for portfolios with large claims but did not demonstrate the knowledge that commercial property lines are particularly vulnerable to extremely large losses.

An average answer wrote as if the scenarios provided in part 4b were certain, rather than just one scenario. It is important to communicate where potential results – especially relating to profit – are uncertain when talking to non-actuarial people.

An average answer spent a lot of time comparing quota share and surplus. While this was not the focus of the question, students occasionally still received full marks so long as they still explained the usefulness of surplus.



Some students noted that the maximum coverage provided by surplus was above the maximum sum insured set by the portfolio manager. While it is valid to suggest the maximum could be increased, it is perhaps more practical to suggest that the number of lines could be lowered for prudence. Firstly, changing this threshold may require changing systems, retraining, and remodelling. Secondly, this threshold may have other positive impacts such as making sure the company avoids particularly complex or hard-to-underwrite policies. Finally, as a reinsurance actuary student's focus is generally going to be on reinsurance. Some students didn't understand the typical features (specifically the high size) of a commercial property line.

For Q5a, students fared pretty well in this part. Weaker students did not justify or explain the change they would make nor the impact of the change on the valuation result/OCL and the materiality of the change. Some students also jumped to conclusions without basing their answers off the information provided. Some answers were not sufficiently different to deserve full marks.

Students sometimes struggled to relate to the context and make answers relevant or based off the information provided in the question. A critical example of this is students giving answers like 'investigate this further', 'raise this with the claims team' that are generic and show zero understanding of the context. Students should focus on giving responses that demonstrate their understanding of concepts, not the claims teams' understanding. Similar to this, lots of responses mentioning points (especially for (a) but also for (b) to an extent) like segmenting the valuation by small/large/CAT or cover type which are not possible from the data given, so impossible to demonstrate their understanding of the specific context. Also 'Explain four things' means four things not 5, 6, 7, 8, ... students who stuck to the number of responses indicated by the question generally did better than those who listed many usually weaker and rambling points.

For Q5b, this was the weakest part of the question. Good students would tie their answers back to the valuation and profit. Weaker students failed to identify many factors that could be included, and of those some did not directly/materially impact profit. Weaker students also failed to justify the impact. A lot of students also made generic comments about AvE experience or choice of model assumptions/model weights without any further detail on what assumptions AvE is relevant for (e.g. actual v budgeted expenses) or specifically which assumptions (e.g. development pattern, finalisation pattern) would materially affect OCL. A lot of students did not understand that we were looking at the profitability of a single, past accident year and gave answers that might affect profitability for a future year but were incorrect for the context e.g. mix of new business/renewals, mix of underlying covers, premium amount, earning pattern,



generally exposure-side impacts on profitability that would have been locked in once the business was written (i.e. did not change during the year).

For Q5c, generally well answered with most students identifying points. Weaker responses did not directly respond to the question or did not provide sufficient explanation / comparison between stochastic and deterministic. For example, a common point was that stochastic can be harder to communicate to stakeholders. Better answers identified why (e.g. method is more technical, range of results) and who the stakeholders are (e.g. Board).

END



GIA: GENERAL INSURANCE APPLICATIONS

1. Summary

1.1. Course Overview

The aim of the General Insurance Applications subject, as part of the Fellowship-level pathway, is to provide students with an understanding of how actuaries work in general insurance in Australia and the legal, regulatory, and professional framework that governs the general insurance industry. This subject also aims to delve into some more specialised technical aspects of general insurance, such as compulsory insurance schemes.

Actuaries have core functions in advising the business in relation to valuation, pricing, reinsurance and capital management. This subject aims to equip students with the tools to perform these functions for an Australian general insurance company or an Australian general insurance scheme.

After successful completion of this subject, students will be able to:

- describe the operation of a general insurance company in Australia as it balances the needs of its various stakeholders and understand the input that actuaries, and in particular the Appointed Actuary, have on the operation and success of a general insurer;
- describe the commercial, legislative, regulatory and professional environments that apply to Australian general insurers and general insurance schemes with a focus on actuarial involvement in the prudential requirements of a general insurer operating in Australia; and
- describe and apply the actuarial control cycle to valuations, reinsurance, capital and risk management for general insurers operating in Australia and understand how pricing, valuation, reinsurance, capital and risk management processes interact.

1.2. Assessment

Assessment for this subject is comprised of the following parts:

- assignment (20% weighting); and
- exam (80% weighting).

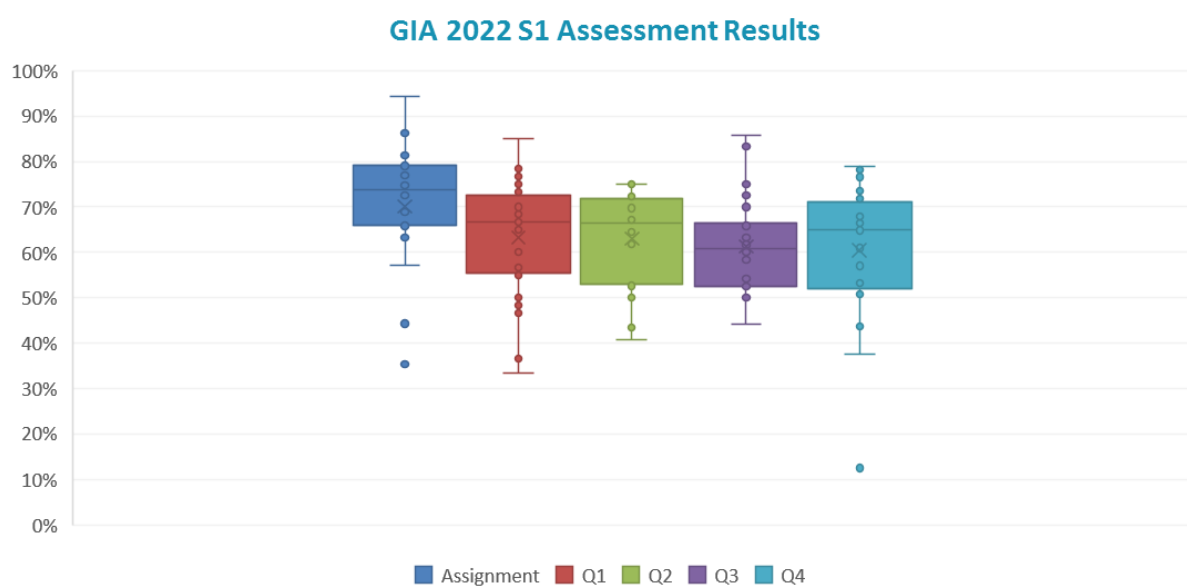


1.3. Pass Rates

Table 1 – Subject results

Assessment	Attempted	Passed	Pass rate
Assignment	24	20	83%
Exam	24	16	67%
Total	24	19	79%

The table above shows that the assignment has a higher pass rate than the exam. The assignments were generally well attempted and of a very high standard. More detail is contained in the chart below.



2. Assessment

2.1. Assignment

The assignment typically assesses a student's ability to:

- apply the subject knowledge; and
- perform higher levels of critical thinking such as analysis, evaluation and creation.



The specific skills that were being developed and assessed in the assignment were to calculate capital requirements and cashflows for a general insurance company and draft sections of the financial condition report relating to capital and profitability.

The assignment comprised 7 parts as summarised in the table below:

Table 2 – Assignment questions

Part	Marks	Summary
1	10	Describe each component of the insurer's provisions
2	20	Apply 3 valuation methods in order to calculate the insurer's OSCL
3	15	Compare the 3 results of the three valuation methods and the amounts shown in the accounts
4	15	Determine the ICRC and PCR
5	9	Comment on the insurer's capital position, investment strategy and reinsurance strategy
6	10	Forecast the insurer's cashflows
7	24	Draft the profitability and capital sections of the insurer's FCR

The learning objectives assessed in this assignment are shown below.

Table 3 – Assignment learning objectives

Question	Learning objective	Module	Weight
1	8. Describe the role of the regulators supervising general insurers and how their operations affect actuarial practice.	4, 5, 6	7%
2	Pre-requisite		20%
3	13. Describe and apply the actuarial control cycle to valuation for a general insurance company operating in Australia in order to prepare components of key inputs and outputs and to evaluate the outcomes from this process.	7, 12	15%
4	8. Describe the role of the regulators supervising general insurers and how their operations affect actuarial practice.	4, 6	15%
5	10. Construct appropriate capital targets for a general insurer including the calculation of regulatory capital requirements and describe the linkages between capital management and an institution's risk management framework.	4, 8, 9, 10, 14	9%



Question	Learning objective	Module	Weight
6	7. Describe the Australian Accounting and Financial Reporting Standards for general insurance in Australia and how these relate to actuarial valuation and provision of advice.	7	10%
7	15. Describe general insurance actuarial management techniques used to create appropriate and comprehensive reporting on financial condition.	8, 13	24%

2.2. Exam

The main purpose of the exam was to assess students ability to:

- demonstrate a correct understanding of subject knowledge;
- analyse information provided about a situation and appropriately incorporate that information with the technical knowledge to generate a response; and
- recommend viable solutions to given problems.

The questions this semester were built around:

- Review and interpret summary valuation statistics;
- Identify the potential business impacts arising from changes in claims handling and policy terms;
- Describe the relationship between competition and regulation;
- Understand the role of the Appointed Actuary and the Actuarial Advice Framework with new products; and
- Calculate and interpret the impact of catastrophe losses on a reinsurance program.

The learning objectives assessed in this exam are shown below.



Table 4 – Exam learning objectives

Question	Learning objective	Module	Weight
1a, b, c, d	13. Describe and apply the actuarial control cycle to valuation for a general insurance company operating in Australia in order to prepare components of key inputs and outputs and to evaluate the outcomes from this process.	7, 12	11%
1e	8. Describe the role of the regulators supervising general insurers and how their operations affect actuarial practice.	4, 5, 6	8%
2a, 2b	14. Describe and apply the actuarial control cycle to risk management for a general insurance company operating in Australia in order to prepare components of key inputs and outputs and to evaluate the outcomes from this process.	8	14%
2c	11. Describe and apply the process of reinsurance management for a general insurance company operating in Australia. 13. Describe and apply the actuarial control cycle to valuation for a general insurance company operating in Australia in order to prepare components of key inputs and outputs and to evaluate the outcomes from this process.	7, 10, 12	10%
3a, 3b	1. Describe the significant components and trends within the Australian general insurance market.	2	9%
3c	15. Describe general insurance actuarial management techniques used to create appropriate and comprehensive reporting on financial condition. (Modules 8 and 13)	8, 13	4%
3d	1. Describe the significant components and trends within the Australian general insurance market. 14. Describe and apply the actuarial control cycle to risk management for a general insurance company operating in Australia in order to prepare components of key inputs and outputs and to evaluate the outcomes from this process.	2, 8	9%



Question	Learning objective	Module	Weight
3e	3. Describe the legislative environment for general insurers in Australia and how this relates to the issues an actuary is expected to address.		
	12. Understand and be able to describe the Actuarial Advice Framework (AAF) as applied in a general insurer in Australia.	3, 4, 6,	
	16. Describe the various roles and responsibilities of the actuary within a general insurance company.	11	16%
4	11. Describe and apply the process of reinsurance management for a general insurance company operating in Australia.	10	20%

3. Results by assessment component

3.1. Assignment

Table 5 – Assignment results

Grade	Number of students	Percentage of students	Average of Mark
Significantly above pass level	5	21%	85.4
Above pass level	10	42%	74.9
Pass level	5	21%	66.7
Below pass level	2	8%	50.8
Significantly below pass level	2	8%	35.3
Grand Total	24	100%	70.1

The following table shows the content and weighting of each of the assignment questions.

Assignment questions and weighting of overall assignment mark		
1	Components of provisions	7%
2a	Apply valuation methods	4%
2b	Select valuation assumptions	6%
2c	Valuation judgement	7%
2d	Calculate OSCL	3%



Assignment questions and weighting of overall assignment mark		
3a	Compare valuation results	8%
3b	Additional information	2%
3c	Valuation and accounts	5%
4	Calculate capital	15%
5a	Evaluate capital position	3%
5b	Investment strategy	3%
5c	RI Strategy	3%
6	Calculate P&L	10%
7a	FCR concepts	14%
7b	Clarity of report	10%

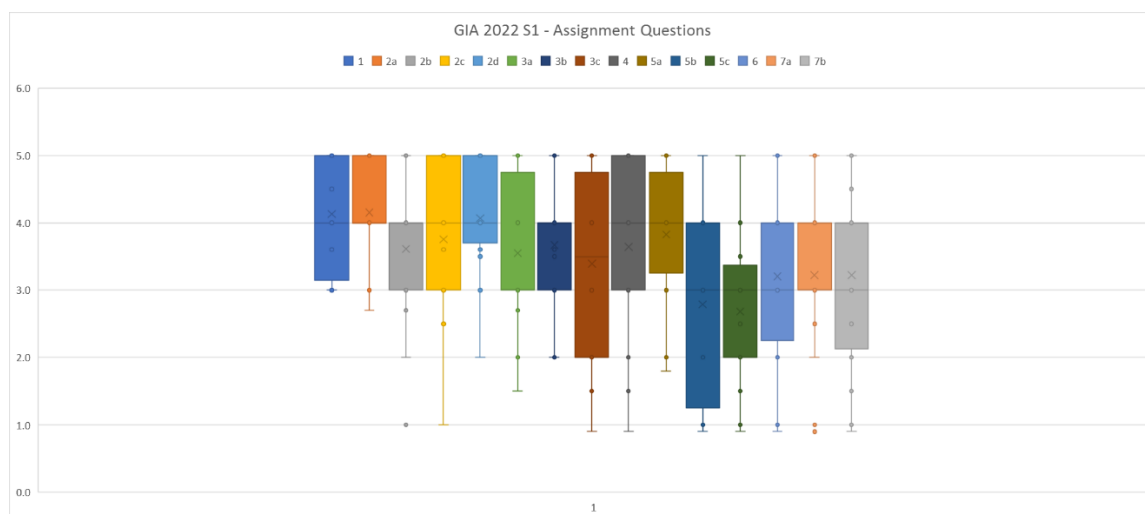
Students showed a good understanding of how to execute the three valuation methods (Q2) and calculating the capital requirements (Q4).

Questions which required students to explain/discuss concepts or make lots of assumptions seemed to be more challenging and there were often times when they were not able to communicate this clearly or effectively (e.g. explanations were sometimes overly technical, calculations were overly complex or difficult to follow).

Some submissions for the FCR in Q7 clearly felt like answers to an assignment, rather than a professional actuarial report that you might provide to a client or to management.

While it was good to see analysis being done to a very high quality, at times the analysis performed in the spreadsheet was not explained well in the report; and students should also be mindful that the report should be a standalone document without having to be read alongside the spreadsheet.

The following chart shows the number of students awarded each grade for each question.



The chart above shows the results for each sub-part of the question. The two weakest parts of the assignment – and the only parts where the average marks were below a pass level – were for question 5b and question 5c which were on investment strategy and reinsurance strategy. The average marks for these questions were 2.8 and 2.7 respectively – only just below a pass. However, these parts of the assignment only contributed 3% to the overall mark. Also, the student's overall performance on question 5 was lifted by the results on question 5a (which also contributed 3% to the total assignment marks) where students scored an average of 3.8 marks out of 5.

Comments on results by questions

Question 1 – Better students were able to articulate clearly the treatment of reinsurance, claims handling expenses and discounting in each item. Some students incorrectly stated the central estimate of outstanding claims related to the 50th percentile of the distribution.

Question 2 – Students generally showed a good understanding of how to execute the three valuation methods. Some students made explicit allowance for inflation in the paid chain ladder method and others did not allow for inflation in the payment per claim incurred method. Better students:

- made development factor selections as required to smooth or adjust the experience and explained this;
- justified the use of appropriate historical averages (e.g. last 5, all or last 3 etc) were selected; and
- tail factors were selected (no tail is also a selection) and justified.



Question 3 – better students were able to recognise that the three methods are estimating the same number but the results differ due to differences in the methodology and the impact of large claims. Better students were able to tailor their response about the methods and additional information specifically to the situation, rather than providing a more standard bookwork answer to this question.

Question 4 – the answer to this question is a combination of definitions, discussion of the purpose of the capital component and then the calculation itself. Students showed a good understanding of the capital requirements. Better students were able to clearly explain what they were doing and how they had arrived at each amount. Poorer responses contained results only.

Question 5 – Students generally performed better in the section discussing capital as opposed to reinsurance and investment strategy.

Question 6 – This was a complicated calculation question, but the students generally performed well with students showing they understood the elements of a general insurer's profit and loss statement and their cashflows. Better students had a clear and well explained approach to the problem whilst poorer students just had the calculated answers.

Question 7 - Some submissions for the FCR in Q7 clearly felt like answers to an assignment, rather than a professional actuarial report that you might provide to a client or to management.

3.2. Exam

The total average mark was 49.5 out of 80 (62%).

Performance of high rankers was more consistent across the 4 different questions than that of low rankers.

The average of the top three papers was 75% whilst the average of the bottom three papers was 45%. As the range between the top 3 and bottom 3 is small (less than 30%) this implies that the individual performances were not much differential.

A sudden poor performance in question 4 may imply time management failure but it was the case for only a few (2 to 3) papers which implies no significant issue regarding time management.



Question 1 -

- Part a was well answered (with an average mark of 94%) – question was straightforward
- For the later parts:
 - Many students were able to identify the key principles but better students were able to connect them to specific observations or the given situation.
 - Some students misunderstood the given summary statistics, referring to wrong column or misinterpreting some basic statistic items.
 - Some students were unclear about profitability concept, with a few students unable to identify the limitations of using the loss ratio data to assess profitability.

Question 2 -

- Part a) was relatively well answered (average mark of 71%) compared to b) and c) (which had average marks of 56% and 58% respectively).
- In part b), better students included a clear definition of claim duration in their answer.
- In part c), most students focussed on the frequency change due to the increase in excess but did not identify the impact of increase in excess on the 'exposure measure' (the denominator of claim frequency).
- In part c), better students discussed the stability issue and the appropriateness of the method itself rather than focussing on the expected mechanical changes in the PPCI model only.

Question 3 -

- Students scored average marks of 72%, 82% and 87% on parts a), b) and c) of this question.
- Part d) and e) were relatively poorly answered (with averages of 55% and 50% respectively).
- In part a), a few students misunderstood the question – explaining 'why GoTrav was still providing travel insurance after 10 years' rather than 'why only one provider after 10 years'.
- In part d), better students provided a clear definition of 'target loss ratio'.
- In part d), only many students could identify the reasons why the target loss ratio on the earth portfolio would not be appropriate for the space portfolio, but only some students were able to recognise the advantage of it – that is, 'a good starting point'.
- In part e), most answers were not appropriately structured to be used as a note to the product manager. However, one of the exam markers suggested leniency around part e because although part of the marking guides allotted marks for a well-formed/structured answer, the question paper directed the student to "prepare some notes to discuss", and it was not clear from these words exactly what was expected. One student pointed this out in their answer.



Exam marker: "I would suggest the question specify/clarify next time". The question should direct the student to prepare a note to somebody rather than to prepare their notes.

- In part e), some students simply wrote down a comprehensive list of insurance functions – sounding like 'actuaries can help you with everything'.

Exam marker: "Can actuaries really provide better advices on 'product design, distribution, underwriting guidelines, etc.'? It hasn't been penalised in this marking but will need to consider going forward."

- There was a wide range of responses. In part e), most students just listed principles and generic points of consideration at high level. Better students were able to connect these to the specific context of 'GoTrav' and 'SpaceTravel' product, rather than providing a list of principles and generic points of consideration.

Question 4 -

- Parts c) and d) (with average marks of 70% and 65% respectively) were answered better by students than Parts a) and b) (both with average marks of 54%).
- Overall performance on this question was not as good as on the earlier questions, and a few students seem to have run out of time.
- In part a), many students incorrectly assumed that LargeRe should know ACorp's recent revision on its cat events and its results.
- In part a), many students listed points which were not actually about 'business impacts' which didn't score any marks. For example, listing 'expected behaviour, change in perception or required analysis, etc.'
- Some students repeated the same points in parts i and ii of part a) – in which case, marks were allowed once only.
- In part b), many students were able to calculate the ROL with better students being able to interpret what it meant.
- In part c), many students developed unnecessarily complicated calculations for the 'net financial impact of the reinsurance arrangement'. Some of them actually calculated 'net financial impact of the whole gross and RI premium & claim transactions'.



Assessment Committee Report

Semester 1 2022

Exam marker: I think one big point the students are missing is connecting that insurance is a product being sold by a company in a competitive environment (like any other product). They are focused on the technical way insurance works (which is absolutely necessary for an actuary) but failing to see the higher level marketplace. I see this as a common source of fault for the profitability concept in Q1 and also the market effects of changing the CAT model in Q4. However, I'm not sure what to suggest on how the syllabus could focus more on this

END



ERM: ENTERPRISE RISK MANAGEMENT

1. Summary

1.1. Course Overview

ERM is a Fellowship principles (Module 1 and Module 2) subject.

The aim of the subject is to promote the concept of the actuary as a trained ERM practitioner, both effective as a Line 1 manager of risk but also capable of moving into specialist risk management Line 2 roles. The course is inherently principles-based, to ensure the skills will remain transferrable for students as they move across different industries and geographies over their careers. Importantly, students will have been trained 'to be experts in ERM, adding value to businesses in the traditional actuarial fields and in the newer, wider fields'⁵. The subject aims to provide students with the confidence to explore roles outside of their traditional comfort zone of financial service and financial risk management. This aligns with the growing regulatory expectation that actuaries start adding more value in non-financial risk management.

1.2. Assessment

Assessment for this subject is comprised of the following parts:

- assignment (20% weighting); and
- exam (80% weighting).

1.3. Pass Rates

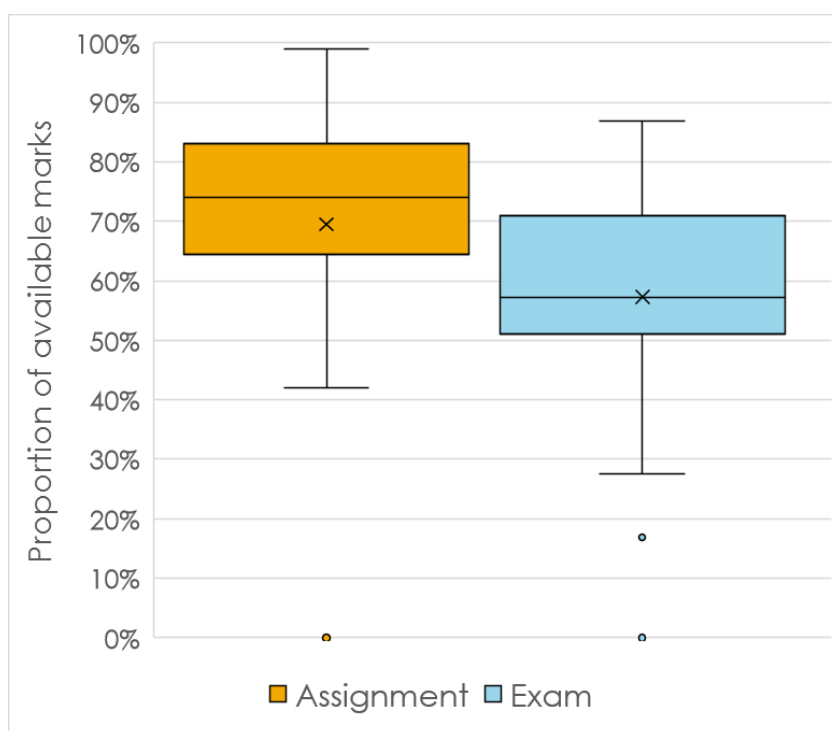
Table 1 – Subject results

Assessment	Attempted	Passed	Pass rate
Assignment	57	49	86%
Exam	59	27	46%
Total	59	33	56%

⁵ [What a CERA knows about ERM - CERA Global Association](#)



Figure 9 – Marks per assessment



Students performed better on the assignment (pass rate 86%) compared to the exam (pass rate 46%). No students who passed the exam failed the subject. Exam results were generally correlated with assignment results. However, there was a cluster of students who had 'above pass' or 'significantly above pass' on their assignment and exam results between 50% and 60%, which included most of the borderline students.

2. Assessment

2.1. Assignment

The main purpose of the assignment was to have students propose, develop, and prepare to implement aspects of a model risk management framework. The problem was set in the context of a large corporate entity with retail and financial services divisions and recently experienced negative press and financial loss due to a failure in a model.

The purpose of the assignment was to assess students' ability to:

- prepare a communication that sets out the scope of a model risk management project;
- relate the proposed project to a risk management framework;
- examine implementation considerations for a large scale ERM project;
- to recommend an approach for implementing model risk assessment;



- to put forward and explain controls for key modelling risks; and
- communicate and synthesise information for senior stakeholders.

The learning objectives assessed in this assignment are shown below.

Table 6 – Assignment learning objectives

Question	Learning objective(s)	Weight
1	1.2, 2.1, 5.3, 6.1, 6.3, and 7.1	20
2	4.1, 4.2, and 4.3	10
3	6.2	10
4	8.2.1, 6.4, 8.2.2, and 7.5	35
5	9.1, and 9.1.1	10
6	1.3, 7.4, and 10	15

2.2. Exam

There were three questions delivered via an online three-hour invigilated exam. Students had access to the subject modules and other learning materials and their notes and online access during the exam.

Each question was divided into sub-questions that were framed using Bloom's taxonomy. During tutorials, students were coached to recognise the command verb in each question and structure their answers accordingly.

The purpose of the exam was to assess students' ability to:

- demonstrate a correct understanding of subject knowledge;
- analyse the information provided about a situation and appropriately incorporate that information with their technical knowledge to generate a suitable response; and
- recommend viable solutions to given problems.

This semester's questions were built around the following contexts:

- Question 1: a new regulator for cryptocurrency-related matters;



- Question 2: a food manufacturer and distributor implementing a growth strategy; and
- Question 3: an agricultural business with trucking and farming business units.

The learning objectives assessed in this exam are in Table 7.

Table 7 – Exam learning objectives

Question	Learning objective (LO)	Weight
1i	1.1 Describe the types of capital that an organisation needs to achieve its purpose sustainably over time	3
1ii	7.1.1 Describe the characteristics of effective risk communication.	4
1iii	6.2 Analyse the ERM roles and responsibilities of the people within an organisation and how the different groups should interact.	4
1iv.a	8.1 Demonstrate statistical risk analysis to analyse risk	3
1iv.b	8.2.2 Evaluate and select appropriate models to handle diverse risks, including models that use a stochastic approach	3
2i.a	7.4.1 Demonstrate how risk profiles can be monitored	0.5
2i.b	9.3.1 Demonstrate a conceptual understanding of risk measures, including measures of capital (regulatory, target, and economic capital) and value, and how they are used to support decision making.	2
2i.c	9.3.1 Demonstrate a conceptual understanding of risk measures, including measures of capital (regulatory, target, and economic capital) and value, and how they are used to support decision making.	3.5
2ii	8.3 Demonstrate the use of scenario analysis and stress testing in the measurement of current and emerging risks	6
2iii	6.1.2 Demonstrate an understanding of governance issues, including the management of conflict, agency risks and incentive misalignment.	4
2iv	6.1.1 Recommend a governance structure that meets good governance principles.	3
3i.a	8.1.1 Demonstrate how each of the financial and non-financial risks faced by an organisation can be amenable to quantitative analysis. (Blooms 3-4)	4
3i.b	9.3.2 Propose techniques of attributing the "cost" of risk and capital to business units in order to gauge performance (e.g. ROE, RORC, ROEC & RORAC).	3
3ii	2.2 Explain the nature of risk, including risk contagion	3
3iii	7.2.1 Apply the risk management process to identify specific financial and non-financial (including strategic) risks faced by an organisation, including external and emerging risks.	2
3iv.a	7.3 Explain the various options available to appropriately respond to, and treat, a risk exposure	3
3iv.b	7.3 Explain the various options available to appropriately respond	4

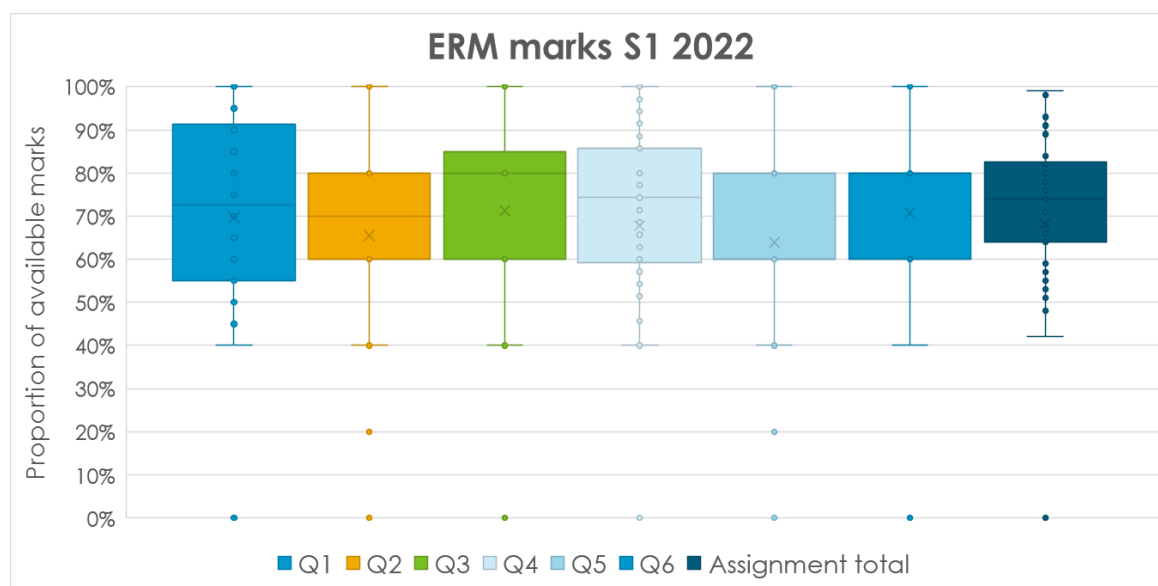


Question	Learning objective (LO)	Weight
	to, and treat, a risk exposure	
3v	5.1 Explain how to articulate an organisation's risk philosophy and risk objectives	3
3vi	5.3 Determine how an organisation's risks and opportunities influence the selection of strategy and how ERM can be appropriately embedded into strategic planning	3
3vii	7.2.3 Consider tools, techniques, and approaches that can be applied to quantitative financial and non-financial data to assist in risk assessment, including for emerging risks and risks that are not easily quantifiable	5
3viii.a	7.2.2 Determine risk exposures using common risk measures (e.g. VaR and TVaR) and compare the properties and limitations of such measures.	4
3viii.b	9.2.1 Demonstrate risk optimisation and analyse the risk and return trade-offs that result from changes in the organisation's risk profile	3
3viii.c	8.2 Evaluate, select, and manage a model to quantify risk by type and in aggregate.	3
3ix.a	8.1.4 Demonstrate the importance of the tails of distributions, tail correlations, and low frequency / high severity events, and the use of extreme value theory to analyse these situations.	2
3ix.b	8.1.3 Evaluate and select appropriate copulas as part of the process of modelling multivariate risks	2

3. Results by assessment component

3.1. Assignment

Figure 10 – Marks per assignment question





Overall, students performed well on the assignment, with a pass rate of 86% among the students that submitted a response. For most questions, the average score was between a score of 3 and 4 on the 5-point rubric scale.

Better assignments demonstrated:

- an ability to adequately respond to questions concisely
- an understanding of the context and stakeholders;
- an ability to link key concerns to the context;
- consideration of the practical challenges that would face an organisation in the context of the problem;
- an understanding of the key factors when implementing ERM projects and the need to prioritise to manage resource constraints; and
- an ability to synthesise information verbally with relevant examples to support communication in the question 6 video.

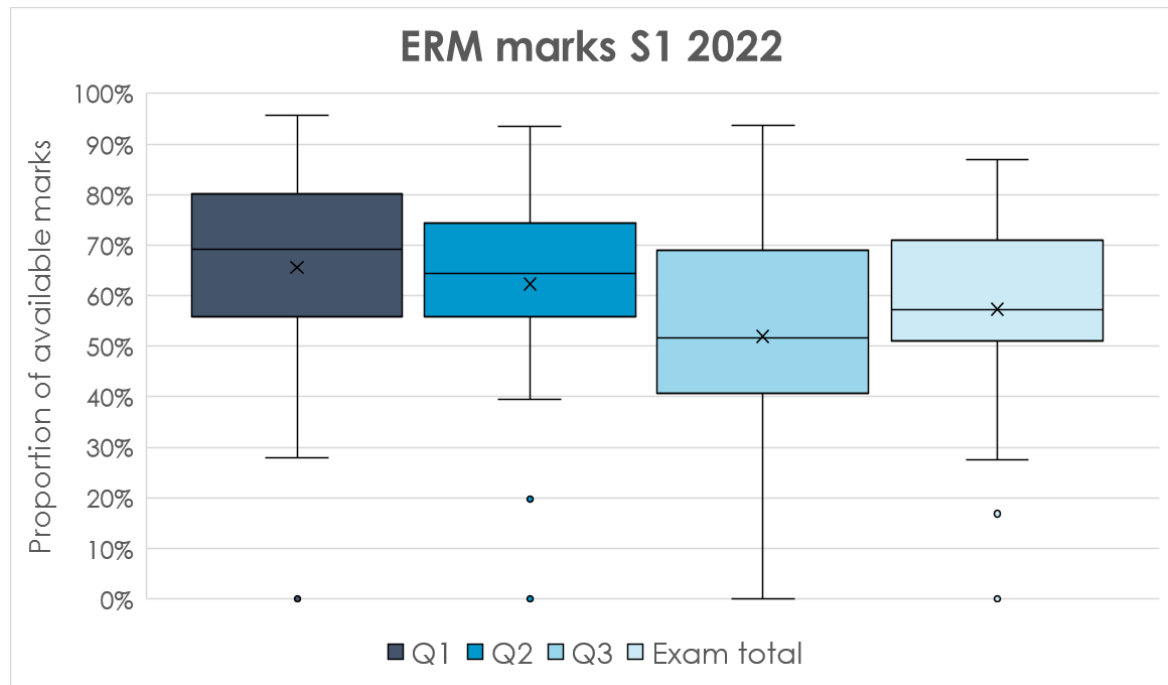
In contrast, the weakest assignment answers:

- failed to consider the context and perspective of stakeholders'
- described relevant concepts but did not translate this into insight by adequately linking back to the context;
- did not provide support for suggested actions; failed to 'tell the story' or inadequately introduced concepts;
- struggled with finding a balance between having discussions that were too high-level or too full of technical detail in the question 6 video.



3.2. Exam

Figure 11 – Marks per exam question



Students generally performed best in question 1, which focused on risk communication, capital, and stakeholders for a new cryptocurrency regulator, and weakest in question 3, which considered an agricultural organisation. Question 3 showed the greatest variability in student marks, while question 2, which considered a food manufacturer and distributor implementing a growth strategy, showed the least variation. There were no higher-order question-parts in question 2, which may have affected its variability.

Students who performed well in the exam:

- demonstrated a sound understanding of the subject materials across all the learning objectives covered in the exam;
- tied their answers very strongly to the context of the question;
- had well-written and succinct answers that addressed the key points; and
- paid attention to the command verb used in each question and answered accordingly (such as outlining the advantages and disadvantages of a solution, before drawing a conclusion, in an 'evaluate' question).

Features of weaker exam answers were as follows:

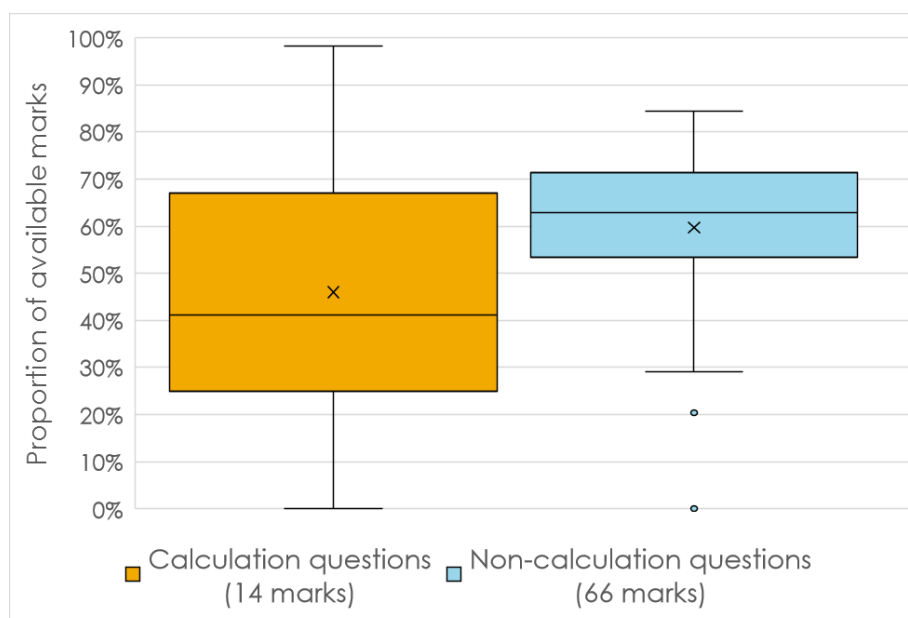


- answers that were copied straight from available materials and did not demonstrate an ability to apply the concepts to the exam question contexts;
- had difficulty in responding to higher-order questions, such as 3i.b, 3viii.c, and 3ix.b and some qualitative application questions such as 2i.c; and
- scored low marks in calculation questions, discussed further below.

A total of 14 out of the 80 marks (17.5%) in the exam were calculation questions. A proportion of these available marks could also be awarded for commentary accompanying the calculations. Figure 12 shows a wider dispersion of marks for calculation questions than for non-calculation questions, suggesting that students may have struggled with calculations. However, performance was mixed:

- top students performed well on calculations, demonstrated by the 90th percentile for calculation questions being higher than the 90th percentile overall (79% versus 76%);
- there was a strong positive correlation between the results for calculation and non-calculation questions – consequently, the calculation questions were not the primary driver of results; and
- the average results were similar across calculation and non-calculation questions when more than zero marks were awarded;.

Figure 12 – Exam marks by question type



END



SRA: SUPERANNUATION AND RETIREMENT APPLICATIONS

1. Summary

1.1. Course Overview

The theme of the subject is to promote the concept of the actuary as an expert advisor on retirement funds, with a focus on the Australian environment. Assisting all stakeholders to work together to ensure that member needs are met forms a core message in the subject. The implications of serving the public goodwill are also discussed. In particular, while actuaries are not responsible for trustee decisions, actions and behaviour, they play an important specialist advisor role to trustees in many situations.

After successfully completing this subject, students will be able to:

- discuss the issues relating to ageing populations and describe the principles of retirement systems in place globally;
- interpret and describe the legislative, regulatory and environmental factors of the Australian retirement income system;
- identify and explain the statutory and professional roles for the actuary in relation to Australian superannuation and retirement funds;
- demonstrate a deep understanding of Australian defined contribution funds – monitor experience, assess risks, present appropriate responses, assess member outcomes, compare funds and prepare and interpret industry analytics;
- apply the actuarial control cycle and actuarial tools to manage specific projects for superannuation and retirement funds;
- demonstrate a deep understanding of Australian retirement income products – design and compare products, assess risks and monitor experience; and
- develop assessment tools and projection models to support consumer decisions.

1.2. Assessment

Assessment for this subject is comprised of the following parts:

- assignment (20% weighting); and
- exam (80% weighting).



Assessment of this subject is split across the following skill levels:

- knowledge (simple application) (20%): demonstration of a detailed knowledge and understanding of the topic;
- application (50%): demonstration of an ability to apply the principles underlying the topic within a given context; and
- higher-order (30%): demonstration of an ability to perform deeper analysis and assessment of situations, including forming judgements, taking into account different points of view, comparing and contrasting situations, suggesting possible solutions and actions and making recommendations.

1.3. Pass Rates

7 candidates enrolled this semester and none withdrew during the semester. All 7 completed the assignment and the exam.

I recommend a pass mark of 60% this semester.

It is proposed that 5 candidates be awarded a pass, which implies a pass rate of 71%.

Table 1 – Subject results

Assessment	Attempted	Passed	Pass rate
Assignment	7	7	100%
Exam	7	5	71%
Total 2022	7	5	71%
Total 2021	2	2	100%
Total 2020	4	4	100%

The total marks this year were in a wide range of 53.8 to 80.1 (out of 100), unlike previous two semesters where results were within a range of less than 10.

The 71% pass rate for this subject is the lower than previous two semesters (100%). Given the small cohorts it is to be expected that the pass rate will fluctuate significantly from year to year. A pass for one student contributes 14% to the pass rate this semester, compared to 50% last semester.



Figure 13 – Marks per assessment



Explanation: The box and whisker chart shows the distribution of results into quartiles, highlighting the minimum, maximum, mean (X) and outliers (•). The boxes show the quartiles either side of the median. There may be lines extending vertically called "whiskers". The range from the bottom of the box down to the bottom of the whisker covers the lowest 25% of results, similarly from the top of the box to the top of the whisker contains the highest 25% of results. In some elements there is no top whisker as the top quartile were all the same result (5) as the highest in the second quartile and similarly there is no bottom whisker if the bottom quartile were all the same result as the lowest in the third quartile.

Figure 1 shows that students all passed the assignment, with the majority performing very well. Q1 was the weakest of the exam questions, Q2 also had a wide range of results but the majority did very well and Q3 had the least variation with no standout students. The combined results show the spread in marks from 54 to 80. Results are discussed further in the next two sections. Those that passed the subject passed at least two of the three exam questions and the assignment. Those that failed overall passed the assignment but failed at least two of the exam questions.

2. Assessment

2.1. Assignment

The assignment required students to write a report for the ICA 2023 on the workings of the superannuation early release scheme of 2020 (in response to the Covid-19 pandemic) and the scheme's impact on longer term retirement outcomes. The report was to be suitable for release to the international actuarial audience and the Australian general public.



The student was required to address 10 elements summarised in a rubric that outlined the grade expectations for each element.

The specific skills developed and assessed in the assignment were the ability to:

- apply subject material in an unfamiliar context;
- communicate relevant points in language appropriate to the audience, in a logical and coherent manner;
- build and manipulate a spreadsheet model and present findings; and
- meet business standards for presentation of written materials.

The learning objectives assessed in this assignment are shown in Table 2.

Table 8 – Assignment learning objectives

Question	Learning objective	Module	K(SA)	A	H
1	3.1.2, 4.2.2	M3.2.2	10	0	0
2	-		0	5	0
3	2.2.4	M3.2.1	0	0	10
4	4.3.1, 4.3.5, 5.3.2, 5.5.1	M4.6.4, M4.6.3	10	0	0
5	5.1.2, 6.3.1		10	0	0
6	8.1.3, 8.1.5	M9.5.3	0	0	10
7	2.1.4, 5.2.5	M9.10.2	0	10	0
8	3.3.1	M3.4	0	0	10
9	3.3.2		0	0	10
10	1.1, 1.2	All	0	15	0
All	Weighting	100%	30%	30%	40%
	Mark	20	6	6	8

2.2. Exam

There were 3 questions delivered via an on-line invigilated exam. The students had access to the course modules and core readings, as well as their own notes.



It was expected that the students should be able to answer the questions in around 3 hours. There was an additional 15 minutes of reading time before the start of the exam and 15 minutes to upload all the answers.

Each question was divided into sub questions and the questions were framed using Bloom's taxonomy. Students had been coached during tutorials to recognise the instruction verb and structure their answer accordingly.

The main purpose of the exam was to assess students ability to:

- demonstrate a correct understanding of course knowledge;
- analyse information provided about a situation and appropriately incorporate that information with the technical knowledge to generate a response; and
- recommend viable solutions to given problems.

The questions this semester were built around:

- employer role, MySuper, impact of PMIF/YFYS, insurance design, coverage and risks;
- retirement income covenant, member outcomes, comparing income products; and
- investment strategy, asset liability modelling, unit pricing risks.

The learning objectives assessed in this exam are shown below.

Table 9 – Exam learning objectives

Question	Syllabus Learning Objective	Page Reference in Course Notes	Total Marks	K (SA)	A	H
1(a)(i)	5.1.4	M3.3.3, M3 ANZIF, M5.2.1, M5.3	5	5	0	0
1(a)(ii)	3.2.4, 5.2.4	M5.2.1, M5.4.2	3	3	0	0
1(b)(i)	5.2.4	M5.4.2, M5.4.7	2	2	0	0
1(b)(ii)	5.2.6	M5.4.2, M5.4.8	3	0	3	0
1(b)(iii)	5.2.1, 5.2.2	M5.4.8, M5.4.9, M3.3.3	3	0	0	3
1(c)(i)	5.2.3	M5.4.7	3	0	0	3
1(c)(ii)	5.2.3	-	2	0	2	0
1(c)(iii)	5.2.1	M3 ANZIF	4	0	0	4
1(c)(iv)	5.3.1	-	6	0	6	0
1(c)(v)	5.2.5	M5.6.8	2	0	0	2



Question	Syllabus Learning Objective	Page Reference in Course Notes	Total Marks	K (SA)	A	H
Sub			33	10	11	12
2(a)(i)	7.2.3	M3.5.2, M7.7.4, position paper and T6	4	4	0	0
2(a)(ii)	7.2.4	""	3	0	0	3
2(b)(i)	4.3.2, 7.2.6	M7.5.3, M7.5.4, M7.8.2	8	0	8	0
2(b)(ii)	7.1.2	""	8	0	8	0
2(c)(i)	7.2.6	-	2	0	0	2
2(c)(ii)	4.2.1, 7.1.2	-	3	0	3	0
Sub			28	4	19	5
3(a)(i)	3.2.6	M6.2.2, M7.5.3	4	0	0	4
3(a)(ii)	6.1.2	M6.2.2, M7.5.3	5	0	5	0
3(a)(iii)	6.1.2	""	4	0	4	0
3(a)(iv)	6.1.4	""	2	0	0	2
3(b)(i)	6.2.2	M6.4.3	4	0	0	4
Sub			19	0	9	10
Total Exam			80	14	39	27
Assignment			20	6	6	8
Subject			100	20	45	35
Target			100%	20%	50%	30%

3. Results by assessment component

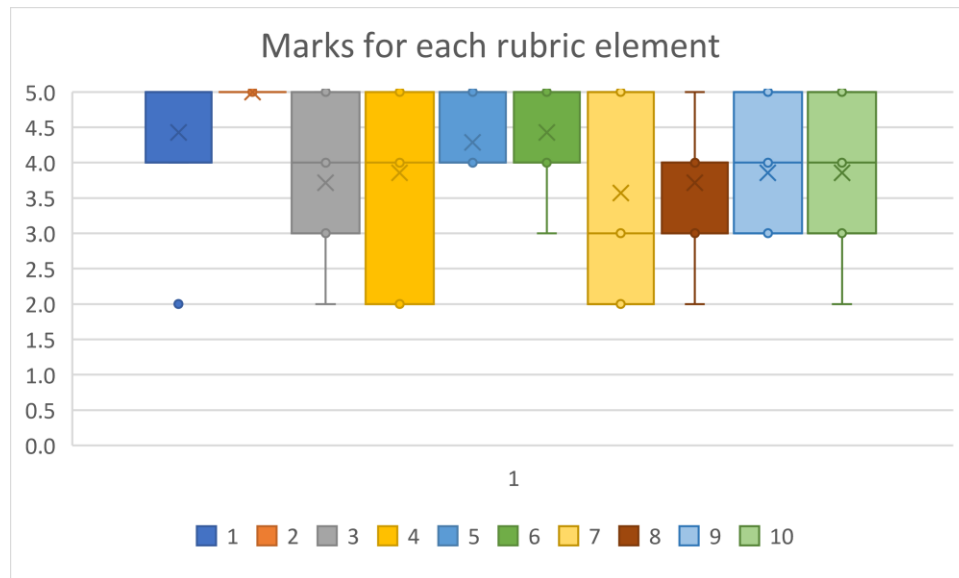
3.1. Assignment

Overall, students performed well on the assignment with a pass rate of 100% with an average mark of 79% (above pass level).

Figure 2 shows the range of marks for each element of the assignment.



Figure 14 – Assignment marks per rubric element



The box and whisker chart explanation is as for Figure 1.

Key observations are:

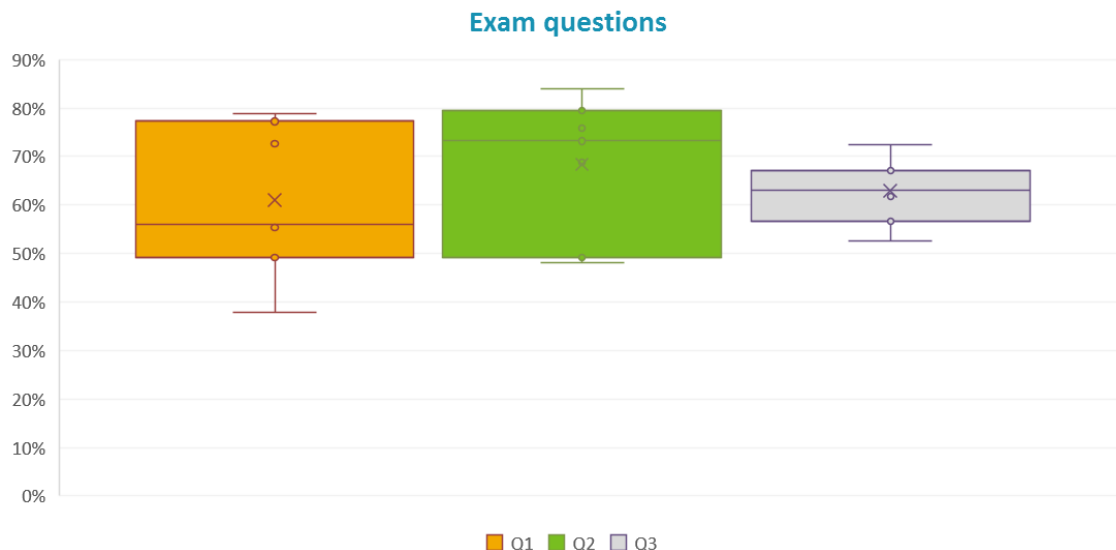
- the results for this semester are in line with the preceding two semesters, noting the very small numbers in all semesters;
- we expect students to pass the assignment and for a high proportion to perform well because of the guidance provided in the rubric and the fact students are not time pressured while working on their submission;
- this proved to be the case, with five students grouped around 80%;
- the lowest mark was 61%, then 78%, 79%, 80%, 2 at 84% and one exceptional result 96%;
- the lowest student (pass) achieved a 4 or 5 on five of the ten elements of the exam, however this was offset by 2 results on four elements;
- the highest performing student with 96% presented a very well-constructed paper with effective visual aids, using clear and concise language that addressed all the questions asked. Notably:
 - this student was one of three to meet all the written communication requirements for a score of 5 (element 10); and
 - the overall submission was presented with appropriate language for a global audience and a structure compatible with a conference presentation; and



- on average, students performed at least at a pass level (3/5) on each element:
 - students performed at their best on explaining the implementation of the scheme, which is understandable given this was a research based question and there were several sources with directly relevant information;
 - the comments for the assessment against the five principles were not always relevant or there was not a clear finding for most of the principles;
 - for the elements requiring evaluation or discussion of risks, the weaker students could have prepared a more rounded discussion and/or reported their own views more clearly to improve their mark;
 - some did not refine and polish their final report as would be expected for a conference paper. Unexplained acronyms, jargon or technical language all detracted, as did inconsistent formatting styles, lack of headings, or overly complex visuals; and
 - all students referenced appropriately.

3.2. Exam

Figure 15 – Marks per exam question



The box and whisker chart explanation is as for Figure 1.

Q1 required advising an employer on the minimum superannuation requirements, MySuper, fund stapling, insurance implications, benefit design and risks in ensuring that their workforce is insured (via super) at all times.



Several students failed to appreciate they were advising the employer on insurance arrangements within super, focusing instead on the trustee, or peripheral issues. Many failed to appreciate that the employer was paying the premiums removing all costs to the employee. Most students determined an insurance design and calculated the associated cover and premiums. However, only the strongest responses grasped that the insurance premiums would likely take contributions over the concessional contributions limit for the older employees, imposing additional taxes on the member. Few grasped that the employer required all employees to be insured, but this would likely not happen due to fund stapling or employee fund choice – these risks for the employer were only identified by a few.

Q2 required advising a trustee of a small accumulation fund on the retirement income covenant, two income product options and the associated risks of each.

Strong answers explicitly mentioned the covenant's three objectives for members, and then linked the later answers back to these objectives. Weaker answers discussed the accumulation phase and the risks relating to building sufficient balance, rather than the retirement phase related risks for the member (e.g. longevity, inflation and credit (issuer)). Objectives were discussed but not all students could articulate a single specific measurable objective of an aspect that was under the trustee's influence. Explanations to support objectives were weak or missing. Research suggestions gave no consideration to the fund information provided and several did not identify the need for thorough assessment of existing membership profile and needs. Most answers correctly suggested researching annuity providers. Some students confused member and trustee risks.

Q3 required advising a trustee of a very large industry fund on the investment strategy to support a new 'default' account based pension product; the application, benefits and limitations of asset liability modelling; and the additional risks of introducing an ABP to the existing unit pricing.

While a recommendation for an age based cohort approach was most common, a single portfolio approach was also acceptable, however only a few provided sensible reasoning for their recommendation. Weaker respondents also confused asset liability modelling with asset liability management or did not define what they were talking about at all. Explanations of modelling limitations and benefits for the trustee were weak. Scenario answers were expected to address the specific risks arising for the trustee due to the new product, such as liquidity management, that could be modelled. A few students proposed risks for the trustee that were relevant and justifiable; others talked to member investment risks which were not relevant.



Assessment Committee Report

Semester 1 2022

As in previous exams, stronger students applied their knowledge to the particular situation given in the question, identified the key issues, stated the links to the situation, and provided several relevant points in their discussions that supported their findings. Weaker students made errors of fact or did not identify the key issues or did not discuss them adequately, leading to missing or incorrect conclusions or recommendations.

END



DAA: DATA ANALYTICS APPLICATIONS

1. Summary

1.1. Course Overview

Data Analytics Applications is an elective Fellowship Applications (Module 3) subject. It was introduced in Semester 2, 2021. It builds on the data analytics techniques introduced in the Data Analytics Principles subject (in the Actuary program) and offers an alternative path to Fellowship than the more traditional Life Insurance, Retirement and General Insurance pathways. Before studying this subject, students must be familiar with the Data Analytics Principles syllabus, have a basic understanding of Python, and have studied a Module 1 and Module 2 Fellowship subject.

The aim of the subject is to teach students how to apply a range of data analytics skills, such as neural networks, natural language processing, unsupervised learning, and optimisation techniques, together with their professional judgement, to solve a variety of complex and challenging business problems. The business problems used as examples in this subject are drawn from a wide range of industries.

1.2. Assessment

Assessment for this subject is comprised of the following parts:

- assignment (50% weighting); and
- exam (50% weighting).

Assessment of this subject is split across the following skill levels:

- simple application (20%): demonstration of a detailed knowledge and understanding of the topic;
- application (50%): demonstration of an ability to apply the principles underlying the topic within a given context; and
- higher-order (30%): demonstration of an ability to perform deeper analysis and assessment of situations, including forming judgements, considering different points of view, comparing, and contrasting situations, suggesting possible solutions and actions, and making recommendations.

The following table shows the combined skill level coverage across the assignment and exam this semester.



Assessment Committee Report

Semester 1 2022

Table 1 - Coverage of skill levels in assessments this semester

Skill level	Assignment	Exam	Combined assessments	Target coverage
Simple Application	10%	30%	20%	20%
Application	55%	43%	49%	50%
Higher Order	35%	28%	31%	30%
Total	100%	100%	100%	100%

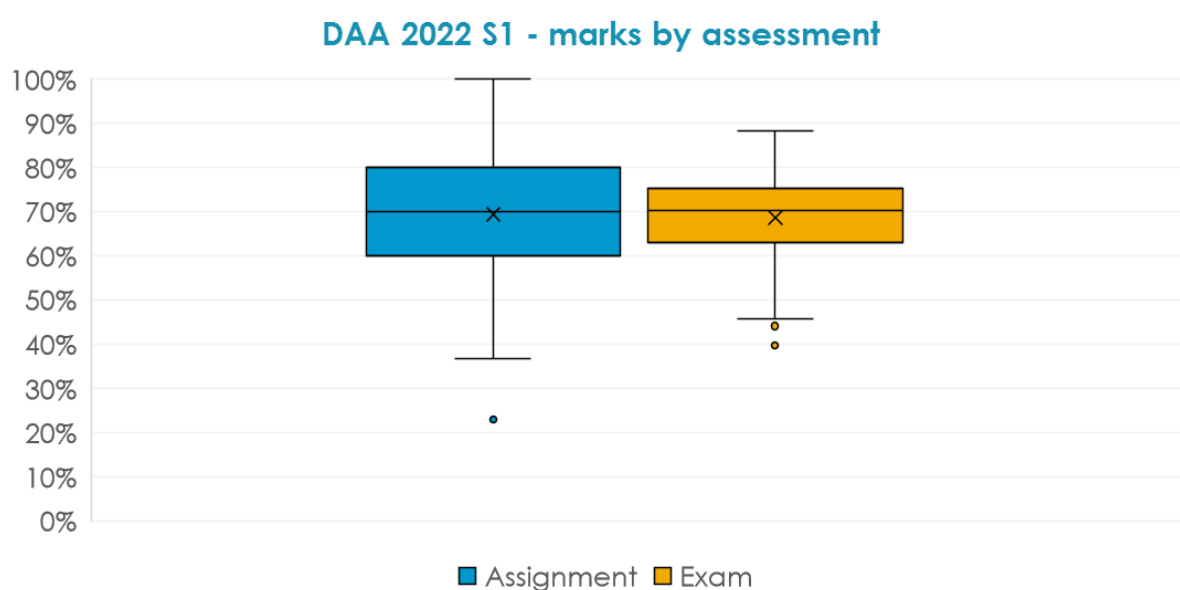
Table demonstrates that the coverage of skill levels of the combined assessments was very close to the target coverage.

1.3. Pass Rates

Table 2 – Subject results

Assessment	Attempted	Passed	Pass rate
Assignment	91	68	75%
Exam	90	73	81%
Total	90	73	81%

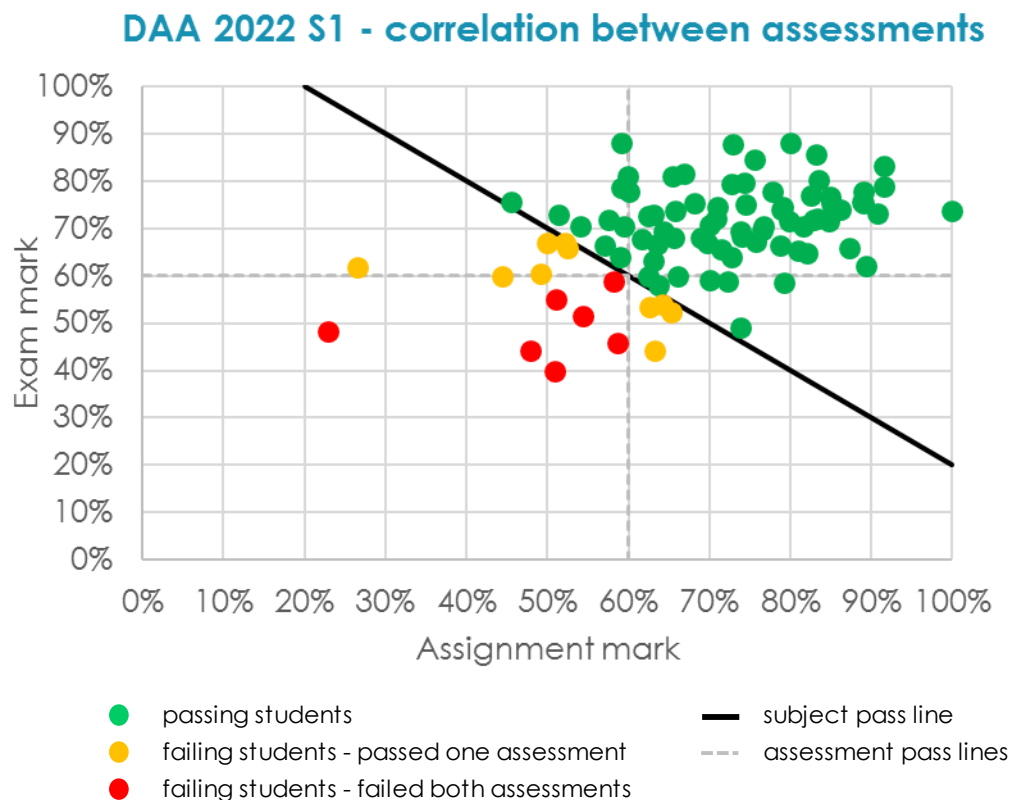
Figure 16 – Marks per assessment





Students performed slightly better on the exam (pass rate 81%) compared to the assignment (pass rate 75%). As shown in Figure 17, there was high correlation between students' assignment and exam results.

Figure 17 - Correlation between assignment and exam results



2. Assessment

2.1. Assignment

This semester's assignment required students to try to predict book sales volumes for a small book publisher, using a dataset sourced from Goodreads. The dataset contained both numerical features (such as date published, number of pages, number of reviews) and text features (such as author, title, description).

The main purpose of the assignment was to assess students' ability to:

- consider the business environment in which a problem is to be solved;
- apply data analytics techniques to solve a business problem; and
- communicate the outcomes of their analysis to business stakeholders.

The specific skills that were being developed and assessed in the assignment were the ability to:



- select appropriate techniques for acquiring domain knowledge;
- evaluate how well data describes business activity;
- develop and evaluate solutions to a classification problem using GLMs, tree-based models, ensembling and neural networks;
- perform k-means and hierarchical clustering;
- evaluate a clustering algorithm using internal, external, and manual validation;
- apply each step in the natural language processing pipeline to solve a business problem; and
- implement strategies for gaining stakeholder support for data analytics projects.

The learning objectives assessed in this semester's assignment are shown below.

Table 3 – Assignment learning objectives

Question	Syllabus learning objective	Module	Total marks	SA	A	H
1	1.1.2.	2	15		15	
2	1.4.3.	4	10	10		
3	2.3.4.	7	13		13	
4	2.2.6	6	7		7	
5a	2.1.3.	5	10		10	
5b	2.1.3.	5	15			15
5c	2.1.3.	5	10			10
6	2.1.3.	5	10		10	
7	3.1.4.	9	10			10
Total			100	10	55	35
% Total			100%	10%	55%	35%

SA – simple application, A – application, H – higher order

2.2. Exam

There were four questions delivered via an on-line three hour invigilated exam. During the exam, students had access to the subject modules and other learning materials, as well as their own notes.

Each question was divided into sub questions that were framed using Bloom's taxonomy. Students had been coached during tutorials to recognise the command verb in each question and structure their answer accordingly.



Students were not required to perform any Python coding in the exam. The ability to apply data analytics techniques using Python was assessed during the assignment.

The main purpose of the exam was to assess students' ability to:

- demonstrate a correct understanding of subject knowledge;
- analyse information provided about a situation and appropriately incorporate that information with their technical knowledge to generate a suitable response; and
- recommend viable solutions to given problems.

This semester's questions were built around the following contexts:

- Question 1: using NLP and clustering to improve workplace safety outcomes;
- Question 2: optimising book sales for a small book publisher;
- Question 3: analysing ethical issues related to contact tracing applications; and
- Question 4: building an injury risk scoring model for a national basketball team.

The specific skills that were being developed and assessed in the exam were the ability to:

- outline the Australian security and privacy laws and regulations that apply to data analytics work;
- evaluate various ethical perspectives that influence data-driven decision-making;
- examine an ethical framework that drives a strong data ethics culture;
- explain the benefits and challenges of real-time data flows;
- explain what a neural network is;
- develop and evaluate solutions to a range of classification problems using GLMs, tree-based models, ensembling and neural networks;
- explain how clustering techniques can be used to gain business insight;
- evaluate a clustering algorithm using internal, external, and manual validation;
- explain what natural language processing models do;
- outline the four key tasks of natural language processing;
- explain how optimisation algorithms can be used to make decisions when resources are constrained; and
- explain the need to monitor a model's deployment over time.



The learning objectives assessed in this semester's exam are shown below.

Table 4 – Exam learning objectives

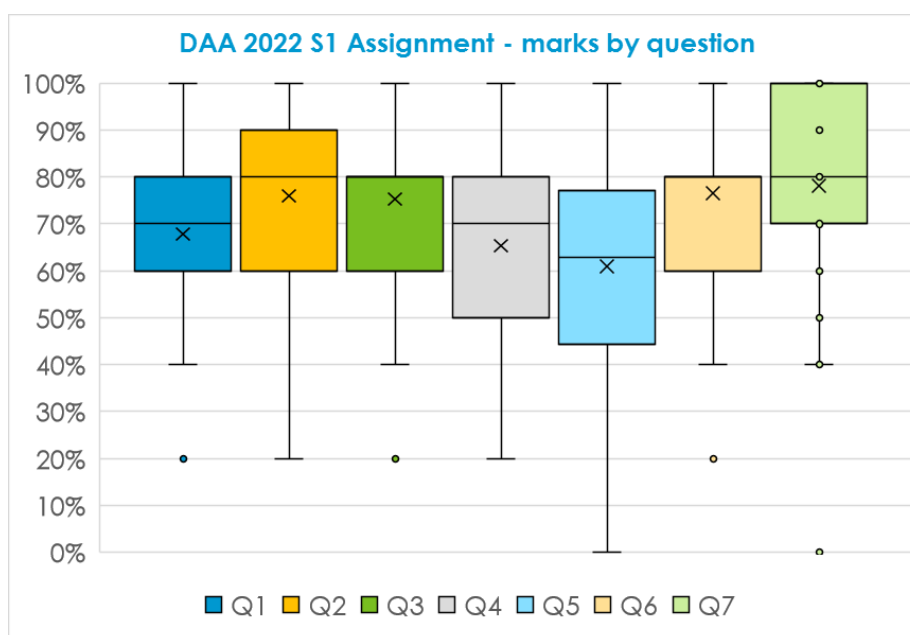
Question	Syllabus Learning Objective	Module	Total Marks	SA	A	H
1a	2.3.1	7	4	4		
1b	2.3.2	7	6		6	
1c	2.2.4	6	4		4	
1d	2.2.8	6	2			2
1e	1.2.3	3	4		4	
2a	2.4.1	8	5	5		
2b	2.4.1	8	4	4		
2c	2.4.1	8	2	2		
2d	2.4.1	8	3	3		
2e	3.1.7	9	6		6	
3a	1.3.2	3	16			16
3b	1.3.1	3	4			4
4a	2.1.1	5	6		6	
4b	1.4.8	4	6	6		
4c	2.1.3	5	4		4	
4d	2.1.3	5	4		4	
Total			80	24	34	22
% Total			100%	30%	43%	28%

SA – simple application, A – application, H – higher order

3. Results by assessment component

3.1. Assignment

Figure 18 – Marks per assignment question





Students performed best in Question 7, in which they presented the conclusions from their analysis to the book publisher. Question 5 had the greatest spread of answers. In this question, students had to construct and evaluate a classification model to predict book sales.

The best assignment answers:

- had good structure in their writing, code, and presentations, making it easy for markers to see that they had met the relevant rubric criteria;
- provided clear explanations of the relevance of each book publishing characteristic to the analysis being undertaken;
- recognised that some of the data was less developed (i.e. books had been published more recently) than other books, and made a suitable adjustment for this;
- interpreted the output from each step of their code and linked this interpretation back to the aim of predicting book sales and to relevant external research from Question 1;
- explained each modelling step being undertaken, why it was being performed, and what it meant in the context of predicting book sales;
- took steps to reduce overfitting such as optimising the number of epochs and hyperparameter optimisation;
- identified a broad range of key limitations in their modelling and explained the steps that could be taken to overcome these limitations; and
- presented their Executive Summary using non-technical language suitable for the publisher and focussing on their conclusions and recommended next steps, rather than the detail of their modelling.

In contrast, the weakest assignment answers:

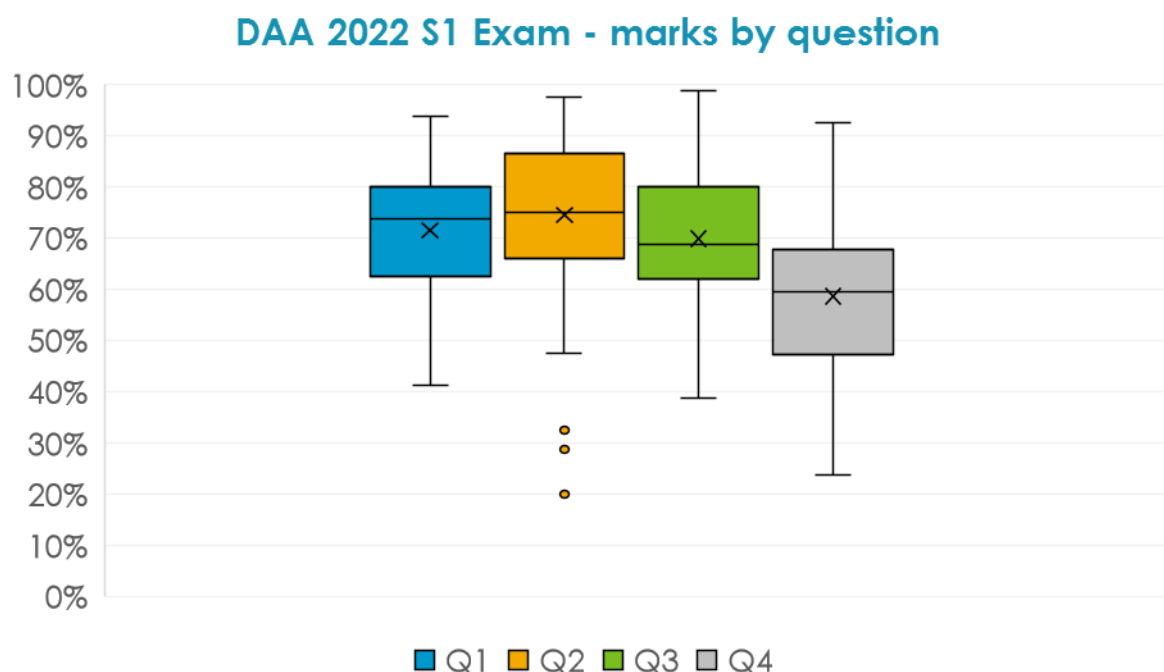
- did not link their domain research to the analysis to be conducted;
- lacked structure in their writing and/or Jupyter notebooks and did not write their answers clearly;
- commented within code cells of their notebooks, rather than in separate text cells above and below their code, making it hard for markers to follow their analysis;
- failed to discuss the usefulness for their later analysis of each feature within their exploratory data analysis;
- mechanically applied NLP, clustering, and classification techniques without discussing each step being undertaken and therefore without demonstrating a good understanding of the modelling they were undertaking or the problem context;
- had issues in their output (such as class imbalance, feature or response leakage, or clusters that didn't make sense) but failed to identify these issues;



- focussed too much on training set metrics rather than validation or test set metrics when choosing a model or evaluating their final model;
- identified generic modelling limitations rather than those tied to this problem context; and
- provided a step-through discussion of each assignment question in their presentations, rather than presenting in an engaging way for the publisher.

3.2. Exam

Figure 19 – Marks per exam question



Students performed best in Question 2, which focussed on optimising book sales for a small book publisher, and weakest in Question 4, which required students to explore the use of neural networks for predicting sporting injuries.

Students who performed well in the exam:

- answered the specific question that was asked, rather than only reacting to a single word or two in the question;
- showed understanding of both the concepts and their specific application within the question context;
- used appropriate language, such as in Question 1 when addressing the head of the insurer's workplace safety division and in Question 4 when addressing the head of the basketball team's strength and conditioning program;



- had excellent written communication skills, with succinct answers that addressed the key points in the question; and
- paid attention to the command verb used in each question and answered accordingly, such as by providing only a brief description for an 'outline' question and a much fuller discussion for a 'consider' question.

Features of weaker exam answers were as follows:

- bookwork-type answers were copied straight from the subject materials and did not demonstrate an ability to apply the concepts to the exam question contexts;
- answers were repetitive, with the same points being made multiple times but disguised as different points using slightly different examples;
- answers were either too brief, failing to demonstrate the student's understanding of the concept, or more detailed than required for the command verb used and marks available, taking away valuable exam time for answering other questions; and
- answers used technical language when it was implied that the audience was non-technical.

END



COURSE 10 COMMERCIAL ACTUARIAL PRACTICE

1. Summary

1.1. Course Overview

The Commercial Actuarial Practice (CAP) Course is designed to teach students to apply actuarial skills across a range of traditional and non-traditional areas by “contextualizing” actuarial solutions or approaches in the wider commercial environment.

The two assessment tasks are:

- A take-home Post-Course Assignment (“Assignment”) on one of the 4 non-traditional topics: Banking, Health, Data Analytics or Environment-Social-Governance (ESG). It is worth 20% of the final mark. Approximately one-quarter of the students were randomly allocated to each topic, except that students were not allocated a topic they had not attended at their Residential course or a topic they had been allocated in a recent semester.
- An 8-hour Case Study Exam (“Exam”) worth 80% of the final mark, under exam conditions with the use of a computer (open book, but no internet access). The candidates had to choose 1 question from the 5 mainstream topics - Life Insurance, General Insurance, Investment, Global Retirement Income Systems (GRIS) or Enterprise Risk Management (ERM), perform all the necessary analysis and prepare a substantial written report.

An overall pass requires a total mark of at least 50%, without necessarily passing the Exam.

1.2. Pass Rates

14 candidates completed the course. Of these, it is proposed that 7 be awarded a pass, representing **a pass rate of 50%**. This pass rate is similar to those experienced in recent years for repeat candidates.

Table 1 – Recent Course Experience

Semester	Sat	Passed	Pass rate%
Semester 1 of 2022	14	7	50%
Semester 2 of 2021	47	27	57
Semester 1 of 2021	73	40	55
Semester 2 of 2020	102	63	62



Semester	Sat	Passed	Pass rate%
Semester 1 of 2020		Deferred due to covid	
Semester 2 of 2019	101	56	55
Semester 1 of 2019	92	42	46
Semester 2 of 2018	88	47	53
Semester 1 of 2018	80	43	54
Semester 2 of 2017	95	58	61
Semester 1 of 2017	90	37	41

2. Post Course Assignment Results

2.1. Structure

No assignments were set this semester, but in order to give credit for past efforts, each candidate was allocated the average of their assignment marks in prior semesters, subject to a minimum of 50%. An additional "bonus" of 5% was given to the 12 (out of 14) candidates who satisfactorily completed the "compulsory pre-work" that was set for the Introduction tutorial this semester.

2.2. Results

The assignment marks ranged from 55% to 86%, with an average of 65%.

The 2 candidates who did not gain the 5% bonus were clear failures overall, and would not have been borderline even if they had earned the additional 5%.

Two candidates passed overall thanks to good assignment marks, despite being slightly below pass standard on the exam. This is something we see in most semesters.

3. Standardisation of Exam marks

3.1. The need for standardization

In order to ensure that candidates are not unfairly advantaged or disadvantaged by their choice of Exam topic, we have again considered "standardization" of marks across the 4 Exam topics. We seek a common "pass standard" across the different Exam topics. The main means of standardization is to have David Service mark at least the borderline exam papers from each topic.



In the past, David's input was augmented by considering the average assignment marks earned by the candidates attempting each exam topic, as an indicator of the relative total strength of each topic's group of candidates. The number of candidates this semester is too small to make this a valid approach, so it has not been done. However, in order to boost the comparability across topics, David has marked all papers this semester.

4. Exam Results

4.1. ERM

The ERM Exam required candidates to report to the Board Risk Committee of a financial services organisation regarding controls and actions the company should implement to prevent recurrences of past operational problems.

Five candidates chose this topic, of whom three passed. There was a good range of marks but no dreadful attempts.

4.2. General Insurance

The GI exam required candidates to recommend changes to an insurer's budget and capital management in the light of a large increase in recession-driven fraudulent claims.

This question was not well answered, with candidates not understanding the impact of IBNR or recommending retrospective changes to reinsurance. 1 of the 5 candidates passed and another was borderline on the exam but passed overall.

4.3. Investment

This case required candidates to design a scholarship payout formula and investment strategy for a university to use so that a large bequest would have a very high probability of lasting forever.

As described below neither answer was strong, but one had enough good aspects so that a good assignment mark gave it an overall pass.



4.4. Life Insurance

The Life case required the candidate to give advice to the chief actuary regarding life and disability insurances for customers with an “Afterpay” style consumer loan. Premium rates, underwriting and investment strategies had to be recommended.

END