

PARTITIONED EXAM TASK FORCE FINAL REPORT

Partitioned Exam Task Force

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November 9, 1990

Partitioned Examination Task Force Report

This report presents the results of our study of examination partitioning.

The report consists of an Executive Summary followed by detailed discussion of our recommendations, discussion of our conclusions and discussion of the tasks we performed.

Enough detail to serve as a reference for subsequent work which may be based on our efforts is reflected in the Appendixes.

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Partitioned Exam Task Force (PETF)
FINAL REPORT
November 9, 1990

EXECUTIVE SUMMARY

PETF deliberations have resulted in four recommendations which would require board action and ten observations which merit board attention. These items are set forth in the executive summary and discussion sections. Other recommendations and observations which are within the authority of standing committees are set out in detailed sections of this report. While the PETF unanimously agrees that broad based partitioning is not feasible at the present time and that some segments of the syllabus should remain unchanged in the foreseeable future, history demonstrates that evolutionary changes are necessary and we believe that controlled changes are possible.

In the course of our work, we have held three meetings, conducted analysis of member comments, prepared, administered and analyzed a student survey, prepared a history of the CAS syllabus, generated various public communications, obtained reactions from the Syllabus and Examination Committees and conducted a host of projects internal to the PETF. Our consensus recommendations are that the CAS board of directors should:

1. Require a systematic study of performance by sub-part prior to every partitioning and syllabus reorganization decision (9 yes/0 no).
2. Charge the VP Administration (CAS office) with collecting and reporting demographic information which may be related to exam performance (9 yes/0 no).
3. Subject to the appropriate study, partition part 4 into 4A (interest and life contingencies) and 4B (credibility theory and loss distributions) (7 yes/2 no).
4. Not partition, at this time, beyond part 4 (9 yes/0 no).

Part 4 lends itself to partitioning because the subject matters are distinct and the minimum competency feature instituted in 1989 has required the Examination Committee to scrutinize sub-part performance. Both prospective partitions have been analyzed in much the same way performance for whole exam units is analyzed. We believe that part 4 grading records and analysis provide the basis for systematic study of part 4 performance by the Examination Committee which will confirm that partitioning

can be done in a controlled manner without material effects on ACAS/FCAS quality or travel time. Further, since part 4A subject matter is distinct from that of part 4B, separate administration of the two will not reduce the comprehension, application, analysis, synthesis or evaluation skills required to pass under the 1990 syllabus. One might expect less recall would be required of candidates attempting only one partition, but question construction can be used to test that by bringing in presumed knowledge from prior exams provided the syllabus specifies prerequisites. Also, memory skills are not all exam specific and should be sufficiently tested in a casualty actuarial context so long as the broad areas which generally define casualty actuaries continue as single, larger exams.

It should be noted that the decision to offer part 4B separately starting in 1992 was a major factor in PETF voting. We did not vote absent awareness of that decision, but it was clear from our discussion that recommendation #3 would have been in jeopardy without it and some members would have felt strongly enough to offer a dissenting report.

Prospects to support similar assertions for other exams are not as good for a variety of reasons. While future changes are inevitable, and some are sure to have partitioning features, no other exam has cleanly divided subject matter and a recent history of passing standards based on sub-parts of a whole exam. Therefore, we see no immediate prospects for partitioning beyond part 4 in a controlled manner which addresses all the additional considerations for implementation itemized by the Education Policy Committee in 1988 and the concerns expressed by members and students since March, 1989. Convictions on this issue are strong and diverse enough that some members advocate making recommendation #4 our #1 recommendation.

The forthcoming part 5 two year transition, which moves exposures, coverages, underwriting, marketing and claim functions to 3B and adds part 5B, finance, as a separate subject, temporarily introduces features to part 5 which are similar to the present part 4. However, transition candidates are unique, finance is new subject matter to the Examination Committee and there are no permanent part 5 minimum standards. Further, the PETF is not aware of any current jurisdictional pressure on part 5, or any other exam, similar to that focussed on part 4 by the Canadian Institute of Actuaries and the Society of Actuaries.

From a longer term perspective, the factors which led us to make recommendations #1, #2 and #4 made us inclined to avoid specific recommendations unique to part 5. However, reaction to the first draft of our report requesting specificity generated report drafting correspondence which clearly documents PETF opposition to partitioning part 5. Four PETF members (including the chairman) offer qualified support for partitioning part 5 when the CAS is better prepared to make a good decision. All other PETF members are apposed to partitioning part 5 in the foreseeable future.

A number of perceptions were formed or reinforced in the course of our deliberations. Upon reflection, most do not seem surprising. However, the significance of each is evolving and needs to be thrust into the conscious thought of CAS management and admissions committees.

1. Travel time is increasing.
2. The body of knowledge reflected in the syllabus is growing.
3. Efficiency of learning materials is increasing, but does not compensate for growth in the body of knowledge.
4. The CAS has very little information to describe and track candidates in terms of overall exam success.
5. The CAS has no data on the demographic characteristics of candidates.
6. Some other professions gather and distribute data on demographic characteristics of their examination candidates.
7. Technical and political demands on the CAS educational system are becoming more complex.
8. Expansion, reorganization and transition partitionings have taken place with regularity over the years.
9. There will be continuing pressure for common areas of study which will be redundant between actuarial and possibly other professions. This is born out by the fact that waiver situations are becoming more frequent.
10. Increasing numbers of candidates strain existing voluntary Examination Committees.

In preparation for future changes, admissions committees should concentrate on understanding how growth in the body of knowledge, efficiency of learning materials, difficulty of exams, preparedness of students, employer study programs and other factors, including the demographic features of our student population, influence exam performance. Substantially more sophisticated information is necessary for our Syllabus and Examination Committees to grapple with increasingly complex demands being placed upon them. Natural evolution has generated exam blue-prints, benchmark questions and statistical analysis of exam results. This needs to continue and should be supplemented by demographic information which can be correlated with exam results and exam exit surveys. Then, travel time and other exam format or administration issues can be dealt with more easily by standing committees without task force attention.

So that CAS public constituencies can understand and accept our examination process, pertinent exam performance summaries and analysis should be made available to members, students, employers, educators and prospective students. Some illustrations of how this would facilitate more informed career planning decisions and better exam progress evaluations are as follows:

- o Students could use exam statistics broken down by study effort, exam load and pre-exam work experience to make study plans.
- o Employers could use exam statistics by type of employer, company study time, monetary incentive, exam load, work experience, undergraduate major, graduate course of study, academic record, type of college or university, and other professional credentials to make recruiting decisions and understand performance.
- o Educators and prospective students could use information regarding courses of study and levels of achievement associated with exam and professional success to provide advice and make career decisions.
- o An individual CAS member's information needs could emanate from any or all of the foregoing perspectives.

In short, we have found that many activities necessary to consider partitioning are also necessary to sustain vitality in our syllabus and examination system. Some of these activities and the related resources currently are inadequate or missing. The detailed sections of this report describe improvement opportunities and outline a process upon which partitioning and travel time management decisions could be based.

DISCUSSION OF RECOMMENDATIONS:

This section describes our discussions of May 31, 1990, when the recommendations were agreed upon and includes some embellishments realized during the drafting of this report. It does not comment on all our projects, nor does it include all the suggestions we have for the Syllabus and Examination Committees. Those are addressed in the Discussion of PETF Tasks section and the appendixes. Points relating to the "additional considerations for implementation" expressed by the Education Policy Committee in its' 1988 White Paper are denoted by (AC1), (AC2), etc..

RECOMMENDATION # 1: REQUIRE A SYSTEMATIC STUDY OF PERFORMANCE BY SUB-PART PRIOR TO EVERY PARTITIONING AND SYLLABUS REORGANIZATION DECISION.

Exams test candidates' professional skills relative to weighted performance standards. For purposes of discussion, a combination of skills and performance standards will be referred to as emphasis.

When a change in emphasis is made, it is accomplished through modifications to:

- o The Syllabus
- o Exam Blueprints
- o Question Construction
- o Performance Standards.

Changes can be controlled in varying degrees depending on what they are and how they are managed. Changes placing new practice areas on the syllabus are less controllable than simple reorganizations or deletions because there is no experience to use as a base. Absent new material, partitioning can be characterized as simple reorganization, so it should be controllable. However, supporting mechanisms must be in place or the control concept has no application.

To control emphasis changes, the admissions committees must be able to compare effort required to pass by similar groups being tested at different times on the same set of skills (AC5). In other words, do a "systematic study" of performance history with respect to the set of skills under consideration.

In a general sense, need for "systematic study" extends to the entire syllabus. Each exam is part of a path leading through associateship to fellowship and minor changes along the way can result in a major change for the process as a whole. Continuing "systematic study" is necessary to ensure that future changes (partitioning or other) will have minimal effect on candidates succeeding under the 1990 syllabus (AC1). Continuing study is also required so that travel time is affected as little as possible by partitioning or other changes (AC2). See Appendix 4.

Questions as to who must do what and when to produce a "systematic study" have different answers depending on circumstances, but the Examination Committee and CAS office would bear most of the burden. The Syllabus Committee and Education Policy Committee would be involved to a lesser extent.

In a partitioning context, the examination committee must isolate and track exam performance at the sub-part level. Records by sub-part should be kept and analyzed for demographic control groups prior to that subpart being administered as a separate unit. For example, part 10 performance on reinsurance for math majors with five years ratemaking experience supported by a company study program who put in 500 study hours should be known so it can be compared to subsequent experience for similar groups of candidates if part 10 reinsurance were to become a separately administered unit or part of another exam.

Further, various skills (recall, comprehension, application, analysis, synthesis and evaluation) are affected in different ways and degrees by partitioning (or combining) exams. For example, less recall is required from candidates attempting only one partition unless there is some change in question construction. To preserve status quo, more presumed knowledge from prior exams or general experience is required. Synthesis would need to be treated in a similar manner. This implies a need for more syllabus precision with regard to prerequisites and sequence of learning.

On the other hand, recall and synthesis skills are not all exam specific and may be sufficiently tested in a casualty actuarial context so long as the broad areas which generally define casualty actuaries continue as single, larger exams. These areas clearly include ratemaking and reserving, but the particulars are a judgement call (see exam competency groups discussion).

Skills, other than recall and synthesis, are more ingrained in specific applications, articles or topic areas. Testing method changes necessary to preserve status quo under partitioning should be less significant for those skills.

Someone must determine that sub-parts being considered for partitioning make sense as cohesive freestanding exam units. Some sub-parts are better prospects than others. For example, most actuaries would agree that life contingencies and credibility theory can be tested separately without losing the cohesive qualities of part 4, but that interest and life contingencies make a logical pair which should remain together. More subtle distinctions, such as would be necessary to separate insurance law from regulation, would require careful attention, probably by the Syllabus Committee.

Periodically, material is added or deleted from the syllabus to meet changing demands for actuarial skills. This generates new practice areas or changes emphasis in existing areas. Absent examination data from other organizations, the only option when new skills are added is to proceed without the demographic analysis described above as has been done in the past.

Analysis of exam performance by units attempted, previous exam performance and pertinent biographical features will need to be a regular part of the Examination Committee routine to ensure that travel time is not being adversely affected (AC2). The SOA has made limited progress in this regard, but their results indicate meaningful information can be obtained via this means. The accounting profession may have done better than either the CAS or SOA.

Members, and particularly students, have expressed concerns that partitioning is just another way to add more to the syllabus and make the exams more difficult. Examples of evidence cited include new syllabus material being added without dropping something old, hours being added to the exams and greater numbers of questions per exam. There should be sufficient Syllabus/Exam Committee coordination (AC3) so that new material or additional questions improve understanding and make exams fairer, rather than materially altering study requirements.

In short, the term "systematic study" contemplates analysis reflecting on:

- o Syllabus Content
- o Quality and Nature of the Candidates
- o Performance Standards (AC5)
- o Exam Construction (length, difficulty, emphasis, style, etc.)
- o Travel Time Effects
- o Confirmation that Parts of Sub-parts under study represent Cohesive Practice Areas

"Systematic study" would require availability of resources such as exam blue-print variance reports from the part chairmen, post exam grading analysis from the Exam Committee, exam exit surveys completed by the candidates and analysis of the foregoing relative to demographic information which should be resident in the CAS office data base.

RECOMMENDATION # 2: CHARGE THE VP ADMINISTRATION (CAS OFFICE) WITH COLLECTING AND REPORTING DEMOGRAPHIC INFORMATION WHICH MAY BE RELATED TO EXAM PERFORMANCE.

Travel time is the dominant issue raised by the concept of smaller examination units and PETP study has demonstrated that travel time has increased over the last ten years or more while the number of separately administered units has increased from eight to twelve (counting 3a, 3B and 3c as separate). There is some evidence the rate of increase has slowed or stopped, but we were not able to confirm that or go beyond speculative explanations of why the historical changes took place. Intensive search for cause and effect relationships demonstrated current information resources do not support basic inquiry.

For example, there is no information which can relate the amount of preparation time invested by successful candidates vs. unsuccessful candidates from one sitting to the next. We have indications from student and member responses to our survey, member letters, SOA analysis and personal experience that some students take a less ambitious approach to the current part 3 than would be the case were it still a single unit. Exam surveys would provide unique informed opinions regarding this issue.

Similarly, there is no information relating academic training or work experience to exam success. Do candidates with ratemaking experience perform better on parts 6 and 9? Do candidates with legal training do better on part 8? Do accounting and MBA backgrounds give an advantage on parts 7 and 10?

Is it possible that innate ability and ambition of individuals attracted to the actuarial profession changes over time? This parameter is more difficult to estimate, but additional insight is likely to be obtained by observing performance indicators such as:

- o SAT scores and GRE Scores
- o CPA, CPCU, or SOA Exam Accomplishments
- o Major Course(s) of Study
- o Type of College or University
- o Level of Degree
- o Grade Point Averages.

Exam surveys would help to obtain opinions regarding clarity, length and fairness of exams. Surveys also could be used to address difficulty, focus on individual sub-parts and make comparisons with prior exams. Of the three to five hundred candidates who write an exam, there are fifty to a hundred people who, at the appointed time, know the material and the recent exams as well or better than anyone else including the Examination Committee. Surveys could distinguish between candidates who used previous exams to practice under exam conditions, those who used them for reference only and those who did not use old exams. Exam preparation effort should be measured in terms of total study time, company study time, study group participation and some measure of pressure from other interests. Survey questions should be exam specific to identify prior training which may give an advantage. Survey content should be determined by the Examination Committee subject to applicable security and privacy constraints.

The Examination Committee should not have access to demographic or survey information with respect to current candidates until after grading is complete, pass marks and applicable minimum competency requirements have been determined, and results have been communicated to the candidates. In other words, candidates should continue to pass or fail solely on the merits of their papers. To maintain student confidence in the security and fairness of the process, surveys may have to be distributed in the form of an enclosure mailed out with results rather than being handed out as candidates leave examination sites.

Information made available to various segments of the public could include:

- o Analysis relating Other Credentials to Exam Results
- o Units Passed vs Units Attempted
- o Employment During Exam Preparation Periods
- o Runoff of students in the system from various exam levels at each examination date. This would explain what happens to students from various points onward. Survey of dropouts may be useful to understand the reasons why they stopped taking exams; all dropouts should not be surveyed as there is little point in asking someone who failed many exams in a row why no further attempts were made.

The data base could be searched for success indicators which should be useful to career counselors in schools and colleges as well as to students, members and employers. These could be conveyed in the form of demographic profiles for new ACAS's and FCAS's by date of last exam for the respective designations. Travel time measured by number of attempts and chronologically could be analyzed for pertinent demographic groups. One might speculate that pertinent groups include employed by an insurance company, employed by a regulator, employed by a consultant, working academics and full time students among others.

The foregoing is not an exhaustive inventory and there may be some types of information which will be inappropriate or difficult to collect, but it appears the CAS needs to substantially upgrade existing student and member data base resources. This includes establishing the capacity to do professional quality surveys and developing software for analysis and reporting purposes. Admissions committees should have an exam management information system with ad hoc reporting features.

In short, the CAS needs to collect data, record it and develop software to support regular information needs pertaining to:

- o Exam Management
- o Syllabus Design
- o Member Services
- o Employer Services (AC4)
- o Public Relations

RECOMMENDATION # 3: SUBJECT TO THE APPROPRIATE STUDY, PARTITION PART 4 INTO 4A (INTEREST AND LIFE CONTINGENCIES) AND 4B (CREDIBILITY THEORY AND LOSS DISTRIBUTIONS).

We began our deliberation of this recommendation by recognizing that the CAS board already has agreed to administer a separate part 4B as an elective for the Society of Actuaries starting in 1992 to satisfy Canadian Institute of Actuaries requirements. We concluded there are only two alternatives:

- o Partition Part 4
- o Offer a Separate 4B Simultaneously with an Unpartitioned Part 4.

We discussed whether exam questions should be different under the simultaneous approach, but concluded there is no justification for that so the issue boiled down to performance measurements. We speculated as to whether or not a 4B pass ratio should be different from a 4b minimum competency standard and, if so, by how much. We discussed the obvious prospect of demand for waivers on Part 4a and 4b when individuals with credit for the SOA interest and life contingencies take and pass 4B. We speculated whether, if partitioning is implemented, pass ratios for the sub-parts should be higher than if the exam continued as a whole.

We debated the considerations contemplated by "systematic study" as that concept can be applied immediately to 4A and 4B. We concluded that all elements are not currently in place, but reasoned that CIA/SOA considerations offset the shortfall.

In the end, the simultaneous exam alternative to partitioning requires more judgment and imposes much more uncertainty and administrative complexity. Recognition of this fact changed some minds and brought our debate to a close. The PETF is not unanimous (7-yes, 2-no) on this recommendation, but members voting no do not feel strongly enough to offer a dissenting report.

RECOMMENDATION # 4: NOT PARTITION, AT THIS TIME, BEYOND PART 4

Our work indicates that CAS educational and testing resources are not sufficiently precise to implement broad based partitioning in a controlled manner. The most apparent evidence is the fact that we can explain only in speculative terms the travel time changes which have taken place over an extended period of years and of which the CAS was largely unaware. Speculation regarding syllabus material, difficulty and length of exams, employer support, student diligence, innate ability of students and the general characteristics of FCAS's does not provide a sound basis for developing a mode of implementation (AC6). If there is to be any further "partitioning" it should be staged so the Syllabus and Examination Committees can do it properly.

Until the CAS can collect and analyze information pertinent to education and testing performance, responsible partitioning of individual exams or syllabus reorganizations is uncertain at best. Given the travel time trend and the growth in our working body of knowledge, it is desirable for the CAS to substitute more factual information and analysis for the intuitive response system which has accommodated changes accumulated since 1914.

We spent a good deal of time discussing the implied warranty that ACAS's and FCAS's have broad based, generally applicable actuarial skills. Frequent comments from members regarding the need to preserve synthesis features on the exams and fear of cheapening the ACAS and FCAS designations further demonstrate the value placed on this warranty. Although the issue was not worked into recommendation form, our consensus was that ratemaking (Part 6) and reserving/accounting (Part 7) should be preserved in much their present form irrespective of how the syllabus might otherwise be rearranged. The synergy argument applies in a similar fashion to advanced ratemaking and individual risk rating (Part 9).

DISCUSSION OF CONCLUSIONS:

A number of perceptions were formed or reinforced in the course of our deliberations. Upon reflection, most do not seem surprising. However, the significance of each is changing and needs to be thrust into the conscious thought of CAS management and admissions committees. Conclusions are set forth in bold type with discussion and reference to appendices where appropriate.

It is clear that travel time is increasing. This is born out by review of CAS office records (Appendix 1) and the student survey (Appendix 2). Why this is happening is not so clear. Member letters and survey responses allude to:

- o Employer Support (monetary incentives, study time, study materials, etc)
- o Job Requirements
- o Family Commitments
- o More Syllabus Material
- o More Hours of Exams
- o More Difficult Examinations
- o Competition on the Partitioned Part Three
- o Candidate Motivation.

However the information necessary to systematically analyze cause and effect is not available and we were not able to answer questions such as:

- o Are there identifiable pockets of more and less successful candidates?
- o Do predominantly data gathering and programming responsibilities prevent an actuarial emphasis in day-to-day work?
- o Does pre-exam academic training of today's candidates compare favorably with candidates of years past?

Most likely, all of these circumstances affect travel time, but the information necessary to separate effects which can be controlled by the CAS from those controlled by employers and candidates themselves is not available. A detailed treatment of the travel time issue is included as Appendix 4.

A cursory review of the syllabus is sufficient to demonstrate the body of knowledge reflected in the syllabus is growing. We compared various points in time during the last twenty years and confirmed that the number of separately administered units increased from eight to twelve, examination hours increased per exam and in total, the number of articles per topic area became greater and the degree of sophistication embedded in syllabus material became greater (Appendix 3). The examined body of knowledge probably has expanded even more because there are more FCAS's (over 100 in 1990 compared to 20 or so in the early 70's) writing questions.

A growing body of knowledge is more than a partitioning issue, but absent more precise controls on the tested materials and grading standards, partitioning could foster inadvertent and undetected changes in exam emphasis. Overemphasis on a large area similar to that on life contingencies from 1980 to 1982 is relatively easy to detect and rectify. Detecting and rectifying under or overemphasis on sub-parts requires more precision.

On the other side of the equation we observe that efficiency of learning materials is increasing, but does not compensate for growth in the body of knowledge. Prominent illustrations of improvements over the last twenty years are the advances in reserving and individual risk rating materials. At one time, the leading edge on reserving was an article by Tom Tarbel, which did little more than define the term IBNR. Clearly, students can learn faster and with less effort in today's environment. Continuing refinements are fostered through the textbook, papers, CLRS, etc.

Along with the refinements come new areas of application as well as new concepts and new techniques for traditional practice areas. Learning efficiencies will not keep up with this knowledge explosion. On the other hand, it is desirable to have as much in the syllabus as available learning tools can accommodate. This presents the Syllabus Committee with the increasingly difficult job of choosing core material from the available body of knowledge.

Review of CAS office records, information required for exam registration and statistics maintained by the examination committees reveals that the CAS has very little information to describe and track candidates in terms of overall exam success. Further, all the information which is captured is not retained and that which is retained is not in a form which can be analyzed together with related information. Except for the fact of passing, virtually all information on parts 1 through 3 is resident only on SOA records. The CAS has only a paper document for each exam registrant which records pass or fail for each exam taken.

In searching for reasons why travel time has changed, we learned the CAS has no data on the demographic characteristics of candidates. What little information that is captured on registration forms and surveys is either lost or in a form which can't be related to individual candidate performance. There is no permanent member number, exam number etc. and there is no data base which records information and makes information available in a tractable form. Expanded biographical data capture is necessary to explore the demographics of our member and student populations.

During our analysis, we obtained documents prepared by the National Association of State Boards of Accountancy which provide demographics behind CPA exam results (Appendix 5). Much of the information is similar to that envisioned by the PETF. This demonstrates the CAS should do more to maintain a competitive understanding of its' members and feeder groups because at least some other professions gather and distribute data on demographic characteristics of their examination candidates.

New areas of application, more people involved in exam preparation and administration, computer grading of short answer questions, demand for casualty actuarial services outside of North America and increasing use of casualty actuarial techniques by non-actuaries indicate technical and political demands on the CAS educational system are becoming more complex. While partitioning may work against simplicity, it does provide flexibility for new situations and transitional periods. Balancing the needs of the CAS with those of the CIA and SOA has become more complex as evidenced by the Canadian part 8, the CIA qualification exam for FCAS's and the move towards more Canadian content throughout the CAS syllabus which will obviate the need for both.

The CAS will be one among many organizations striving to provide learned body services. We should anticipate there will be continuing pressure for common areas of study which will be redundant between actuarial and possibly other professions. This is born out by the fact that waiver situations are becoming more frequent. Waiver requests will take a quantum leap when SOA students who have credit for their theory of interest and life contingencies begin passing part 4B.

Such circumstances are not new to the CAS. Expansion, reorganization and transition partitionings have taken place with regularity over the years (Appendix 3) and it is reasonable to presume this trend will continue.

Partitioning has been considered in various forms (see discussion of the travel time task and Appendix 4), some of which would require more than one annual offering of the same material. While other considerations presently render this a moot point and at the risk of belaboring the obvious, it should be recognized that more offerings would increase demand for exam preparation while increasing numbers of candidates already strain the existing voluntary exam committees. A full or part time education actuary may be necessary at some point in the foreseeable future.

DISCUSSION OF PETF TASKS:

On May 22, 1989, the PETF laid out a plan which involved many tasks. Each was pursued by a subcommittee and all have been completed in the task force context. However, opportunities for improving CAS exam management which have been identified are beyond task force powers of implementation and those are left to the appropriate CAS bodies to accept, reject, modify and implement.

HISTORY OF THE CAS EXAMINATION PROCESS:

It has been said that those who don't study history are doomed to repeat it. CAS examination history has been highlighted in Francis S. Perryman's "The First Twenty-Five Years" presidential address which appeared in PCAS XXVI, Part I and in Dudley M. Pruitt's "The First Fifty Years" which appeared in PCAS LI. More recently, Bill Gillam's analysis of syllabus changes since 1964 was reported in Stanley M. Hughey's "The First Seventy-Five Years" and Dick Snader prepared "CAS Syllabus Milestones, 1960 - 1990, for the PETF (Appendix 3).

Mr. Gillam used the following words (number of times) in a page and a half of double and triple spaced text: expanded (6), included (4), added (3), moved (1), rearranged (1), incorporated (1) and split (1). Mr. Snader, in his more detailed effort, used some of the same words along with a few of his own: partitioned, introduced, began, increased, became, adopted, transition, incorporated, restructured, combined, ended and dropped. The point here is that a general overview of CAS syllabus history will describe mainly expansion and change while a more detailed scrutiny reveals pruning as well.

It is clear the syllabus moves through time in a dynamic fashion which is likely to continue.

DECISION CRITERIA:

The first PETF task was to study the Education Policy Committee White Paper and review the responsibilities of all CAS standing committees which contribute to the admissions process. With that background, all task force members participated in a decision criteria drafting discussion. Decision criteria from the White Paper formed the starting point and was molded into the items and rankings shown on the next page.

Very Important

- o Quality of Education
- o Educational Objectives
- o Type of FCAS Graduate
- o Travel Time to FCAS
- o Positioning CAS vs. Other Career Options

Important

- o Administration of Exams
- o Coordination within CAS
- o CIA Requirements
- o Employer's Viewpoint
- o College and University Programs
- o Coordination with SOA
- o Competency vs. Proficiency

EXAM COMPETENCY GROUPS:

Exam competency groups are sets of actuarial skills which tend to be thought of as one. The concept is somewhat vague and may be perceived differently from one actuary to the next. However, there are practice concentrations such as ratemaking and reserving which are extensively addressed in the syllabus and tend to be the focus for CAS Statements of Principles and ASB Standards of Practice. Further, there is a strong sentiment among the membership to test synthesis skills and preserve the quality implied by associateship and fellowship designations. In fact, syllabus goals and objectives are made up of statements which include phrases such as:

- o "...develop an expert knowledge of.."
- o "...a broad range of techniques.."
- o "...a broad range of relevant and standard actuarial practice.."

PETF deliberation of this item did not produce anything concrete, but there was a recurring theme observed in comments from CAS members that examination features which most uniquely define casualty actuaries should remain whole. Every PETF member believes ratemaking should continue as one exam at the offered competence levels (basic - 3B, principles - 6 and advanced - 9). There was some difference of opinion on whether reserving and accounting could be split, but the consensus was that premium and loss accounting shouldn't be split from reserving and there is no point in isolating expense accounting somewhere else.

Part 8 has features which go together well, but deal with jurisdictional subject matter which is more the invention of political minds than the application of fundamental actuarial concepts and professional principles. It is subject to the same general educational goals and objectives as the other exams, but must be managed with more deference to political authority.

Exam competency group considerations do not appear to impose significant partitioning constraints on parts 4, 5 and 10 because these exams are made up of distinct sub-parts.

SYLLABUS CONSIDERATIONS:

Syllabus partitioning issues include items such as exam blue-prints, skills distributions, exam standards, growth in the body of knowledge, reasonable travel time, and the efficiency of educational materials.

Exam blue-prints provide the Syllabus Committee's recommended point distribution by subject for an examination. They are guidelines provided to the Examination Committee.

Skills distributions are embedded in blue-prints. They provide guidelines on how the Syllabus Committee intends the Examination Committee to construct questions. This may be an area where the CAS needs professional educators to provide clarity and consistency.

Examination standards are the Examination Committee's interpretation of the Syllabus Committee's intent. These are not complete until the Examination Committee has finalized grading guides on an exam by exam basis. Some variation from one sitting to the next is unavoidable, but inadvertent change should be kept to a minimum.

Our examination system must deal with a growing body of knowledge. We are breaking through the point where contemporary knowledge can no longer be tested. Ten or twenty years ago, a good set of examinations could accommodate all or most of the CAS body of knowledge. At the present time, an effective combination of efficient study materials, syllabus arrangements and exam construction can cover just about everything. However, the stress is beginning to show, and we may soon pass from that circumstance to an era when more is known than can be digested by the individuals who are able and interested in functioning as professional actuaries.

Some areas of the syllabus will grow faster than others. Eventually, different syllabus and exam approaches may be necessary for areas likely to experience more growth. Managing this dynamic will require a process to test growth in the body of knowledge vs. efficiency of available learning materials.

Part of deciding what is a reasonable body of knowledge for the syllabus is related to travel time. Reasonable travel time is that which interested professionals are willing to invest in obtaining skills and credentials. If the time required exceeds that threshold, the system will cease to be used. Since there is some finite (but unknown) limit to what people can learn in a given amount of time, reasonable travel time must, in part, be dictated by the size of our tested body of knowledge. Discussions with the Syllabus Committee indicate balancing the size of the syllabus with efficiency of learning materials is a difficult, time consuming, and subjective task.

New areas of practice and a growing body of knowledge have implications for specialty qualifications and continuing education, but these are beyond the scope of the PETF and were not deliberated.

PARTITIONED EXAM BLUEPRINTS:

A detailed plan for implementation should provide for blueprints specifically developed for any and all new partitions. Given our findings in other areas, this task was not treated with intensity.

GRADING STANDARDS/MINIMUM COMPETENCY:

Partitioning provides mandatory minimum competency features for each separate unit. It gives credit for good performance and allows less punting on material which has not been mastered. It also means that lower standards are necessary on individual partitions to guarantee the same minimum competency over the entire syllabus that exists with larger exam units. A more detailed discussion is included in Appendix 4.

ALTERNATIVE CREDIT:

Smaller units resulting from partitioning would yield closer correlation with offerings of other organizations which provide educational tools and means to obtain various kinds of credentials. Inevitably, that would generate more situations where individuals could reasonably expect to be granted alternative credit.

MEMBERSHIP INPUT:

Over 100 responses to Kevin Ryan's March 14, 1989, letter to members presenting the Education Policy Committee's White Paper and asking for comments were received. They raised key issues relating to exam taking, FCAS quality, employer concerns, the CAS and exam administration. A number of ideas and suggestions were offered along with the questions and critiques.

Travel time is the dominant exam-taking issue, but other concerns were identified as well. The travel route to fellowship is at least somewhat unique to each individual. Advantages and disadvantages were identified for taking smaller steps or having the flexibility to take different routes. Stress associated with exam taking and competitive dynamics of small units vs. large units are a concern to many. There is a variety of opinion as to how partitioning may effect motivation. Some are concerned that a large number of units will be a demotivating factor. On the other hand, a smaller, but significant segment of the population believes smaller units may facilitate progress currently constrained by job and other circumstances. Some members believe partitioning would improve clarity and focus of the exams.

Members are very concerned that quality of the FCAS designation be preserved. Some members are concerned that partitioning would allow marginal performers to slip through the system. Others are concerned that smaller units would place less emphasis on the discipline and time management skills necessary to successfully prepare for the current exams. Many members are concerned that smaller units would make it difficult to test synthesis skills.

There is a diversity of opinion regarding memory capacity. Some are concerned that insufficient memory requirements will credential individuals who cannot function well in a competitive business environment, while others criticize the exams for requiring too much rote memory. Generally, members believe the current system to be of high quality and stress that changes (partitioning or other) should be done in a way that preserves quality.

Many members are concerned with the recruiting leverage provided by the examination process relative to MBA, CPCU, CPA and other professional tracks. There is also concern that changes may complicate employers' career programs with regard to study time, exam compensation, record keeping, etc.

Beyond the entry-level stage, members want to maintain effective positioning relative to the Society of Actuaries and the Canadian Institute of Actuaries. International relations will be an increasing concern as political, economic and trade barriers continue to come down.

CAS administrative constraints are a prominent concern as well. There is a limited supply of volunteers to write exams, grade exams, and otherwise support the educational system.

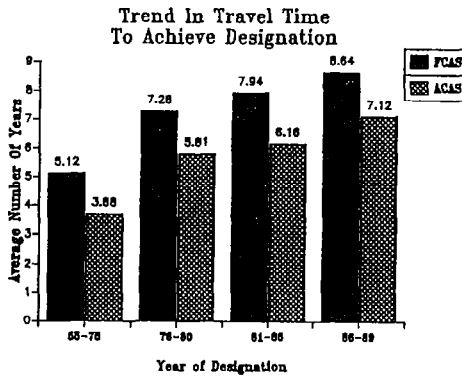
Members suggestions regarding the examination process included the following:

- o Test synthesis by drawing on numerous syllabus areas
- o Give exams more often
- o Use minimum standards on more exams
- o Provide electives
- o Offer nation specific exams
- o Eliminate essay questions

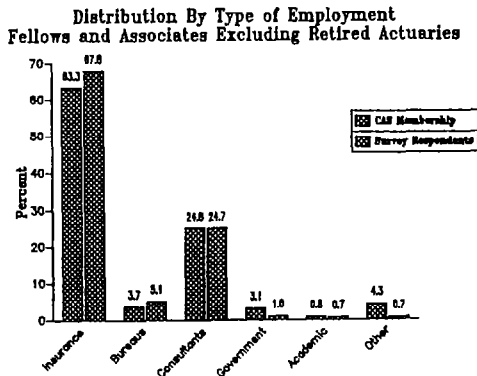
Appendix 6 provides a summary and illustrative samples of the responses.

STUDENT AND MEMBER SURVEY RESULTS:

Surveys mailed to 4,242 individuals generated 704 responses. Associates were most responsive (21%) with the fellows (18%) not far behind. 10% of the students responded. 20% of the overall response was returned by individuals who were not mailed a survey. 50% of the responding fellows received their fellowship between 1985 and 1989. The typical respondent has an undergraduate math degree, works for an insurance company and has 5.6 exams passed. A copy of the survey and summary exhibits are included in Appendix 2



The distribution of respondents by type of employment for fellows and associates excluding individuals who have retired tracks well with the demographics reported in the CAS 1989 Yearbook:



More descriptions of the respondents as a whole are shown in Appendix 2, pages 4 through 10 (A2P4-A2P10).

Generally speaking, respondents were averse to the idea of partitioning. Many feel strongly that it will increase travel time and that the quality of education and actuaries will not be enhanced. Support for the current structure appears to be consistent across designation levels, but fellows appear more conservative than other respondents (See A2P18, A2P34, A2P35, A2P25 and A2P26).

Survey responses were separated between those reporting no more than two attempts on any exam and all others. Interestingly, both groups generally prefer the CAS maintain the current exam structure and not partition parts 5 through 10 (See A2P28 - A2P32).

Motivation was tested by asking respondents whether they would achieve fellowship more quickly as well as whether they could achieve fellowship more quickly if exams were partitioned (A2P22). There was a marked difference in the amplitude of responses although both queries drew negative feedback. A more neutral, but somewhat indicative response along similar lines was drawn from students who have experience with the partitioned part 3 by asking them if they would have followed a more aggressive study program of the exam had not been partitioned (A2P23).

Attitudes toward exams were explored by asking about the effect on career appeal given complete partitioning vs. selective partitioning and no exams vs. the current structure. Respondents favor exams over no exams, but fewer units over more units (A2P24).

Some demographic exploration was done via the survey. We found that 31% of the respondents who have advanced degrees are fellows and that 20% of the respondents who do not have advanced degrees are fellows (A2P11a). We found that respondents with advanced degrees took fewer attempts to pass the earlier and later exams, but about the same or more attempts to pass exams in the middle of the syllabus (A2P15a&b).

Given the sample size and consistency of responses, these observations have a measure of credibility for the time during which the responses were made. Respondents have conveyed a clear sentiment which is adverse to the general idea of partitioning. On the other hand they embraced the concept of an examination system while allowing that specific features influence the energy level expended while pursuing exams and affect the attractiveness of the profession.

Beyond the immediate conclusions which might be drawn from this survey, analysis of the responses, including the limited demographic information which was captured, hints at information possibilities which could provide understanding of pass ratios, travel time and other examination performance trends.

EMPLOYER AND RECRUITING CONSIDERATIONS:

Partitioning would make it easier for life actuaries, academics and non-actuaries to gain CAS accreditation. This could make it easier for employers of actuaries to develop staff, including specialists. While this may be an advantage to employers, it could change the complexion of the CAS.

Since most academically trained actuaries have a life background, CAS employer interests are best served by keeping the early examinations common for as long as possible. This allows students coming out of school with limited specialty awareness to make career choices without losing the career leverage of credentials obtained in academia. The new part 3B may run counter to this CAS employer interest.

Employers might realize the following advantages from partitioning:

- o More associates may achieve fellowship because they are able to pass exams in smaller units more easily.
- o More actuaries could satisfy requirements in Canada, the USA and outside North America, thus increasing their value to the company.
- o Better matching of study with work.
- o More specific education of students.

On the other hand, employers might suffer from the effects of:

- o Travel time increases
- o Drop-outs from student programs
- o Complex administration
- o Marginal performers with credentials (this would be the exception, rather than the rule)
- o Reduction in synthesis, management, memory, etc.. skills of students succeeding under partitioning.

Respondents to Kevin Ryan's letter with the title of Assistant Vice President and higher were highly negative on partitioning (23 to 2). While these are personal opinions rather than official company positions, they probably are a fair representation of 1989 management attitudes.

Generally speaking, partitioning or other changes which produce better actuaries at lower cost are good for employers. Anything else is neutral or a problem so the key to productive change is being able to understand, choose, control and explain the associated effects.

A tangential observation made during completion of this task was that most academic machinery now in place is geared to life, but experience in Canada (LaValle) demonstrates changes can be affected through commitments of money and staff.

CAS DATA BASE:

The Education Policy Committee White Paper strongly suggests "...results under a system of partitioned examinations must be carefully controlled so as not to materially affect travel time.." To address this issue, we needed to observe travel time experience and proceeded to collect and compile statistics from the CAS office in a PC data base. Observations and conclusions which emerged regarding the data available for our use proved to be as significant as the empirical results.

Findings:

1. Available Data

Very little information is available to describe and track candidates in terms of overall exam success. Information currently maintained (and which was used for PETF analysis) consists of handwritten sheets for each candidate which document exam registration and whether they passed, failed or did not write. A sample CAS office record is included in Appendix 1.

2. Travel Time Trend

We obtained approximately 500 manual records from the CAS office representing all candidates who became Fellows from 1979 to 1988 and transferred them to a PC data base for analysis.

The results (Appendix 1) demonstrate travel time has increased. This conclusion was reached by comparing the average number of years required to complete the exams for those candidates who became fellows between 1979 and 1988 with that of 1984 through 1988 fellows.

	CAS Exams Passed	Number of Candidates	Travel Time in Years
1979-88 Fellows	6	100	4.6
	7	139	5.7
	8	80	8.3
	9	101	8.0
	10	80	8.1
1984-88 Fellows	6	84	4.8
	7	101	5.7
	8	30	10.1
	9	30	10.4
	10	23	10.7

These observations show longer travel times than the survey responses which indicated travel time had increased from 7.9 years to 8.6 years during roughly the same period, but the trend is consistent. The difference in absolute values could mean only motivated individuals responded to the survey and therefore represent a group more likely to do well on exams. It also could mean that relying on memory to fill out a survey isn't the most accurate means to capture historical information or that questions asking for date of first exam, date of associateship and date of fellowship were ambiguous and misinterpreted. The difference was judged to be nuance and not material for task force purposes.

Analysis of travel time experience by individual year of designation indicates increases may have diminished or that growth generated effects have been digested (see Christopher Diamantoukos analysis in Appendix 1.) We did not draw conclusions other than that these types of diagnostics should be a regular part of CAS exam management information.

With respect to why travel time has increased, a probable reason is that total examination hours required for fellowship increased from 33 hours in 1979 to 37 hours in 1987. Other possible explanations include:

- o Expanded Body of Knowledge Covered by the Syllabus
- o Changed Examination Standards
- o Increased Skill Level of Some Candidates leading to Higher Pass Marks.
- o More Marginal Candidates Taking Exams.

The first two items should be analyzed by the Syllabus and Examination Committees, respectively. The other two are addressed below.

3. CAS Demographics

Currently, the CAS does not have demographic information resources which would provide candidate characteristics by degree of examination success. Consequently, we were unable to ascertain whether the student "mix" has been changing. If we had access to information that could indicate how time specific candidate populations are different, some speculation could be removed from the hypothesis offered above.

Further, we believe this lack of information and our inability to explain the apparent change in travel time to ourselves puts the CAS and its stakeholders at a competitive disadvantage relative to other career options. We did not do exhaustive research on demographic information resources of other professions, but did obtain (Appendix 5) an example of reports on CPA candidates published by the National Association of State Board of Accountancy.

Data Base Recommendations:

1. The CAS should institute and maintain a data base which makes it possible to track candidates in terms of overall examination performance. Items which would need to be compiled should include (among others):

- o Exam(s) taken at each sitting
- o Passes and Fails at each sitting
- o Casual vs. serious attempts at each examination

Data should be compiled both retrospectively and prospectively. It may be useful to conduct a survey where historical data is not available in the CAS office.

2. The Syllabus Committee should be asked to review the body of knowledge covered by the syllabus to determine if it has expanded leading to increases in travel time.

3. The CAS Examination Committee should be asked to monitor examination standards over time with respect to both question difficulty and grading. Pre-exam blue-print analysis should be required of the part chairman and exam exit surveys should be obtained from students. This may be an area where the CAS requires assistance from professional educators to interpret results effectively.

Regardless of the approach used, the CAS office should be in a position to maintain a system for recording and compiling results of such studies.

4. The CAS should gather data to be used for understanding demographic characteristics of candidate performance. Results could be used to monitor changes in the student "mix" over time and should be distributed to current members and students as well as potential students and educators.

Examples of data that should be gathered would include (among others):

- o Educational Background
- o Academic Record
- o SAT scores
- o Employment History

5. The CAS should increase its capacity to do professional quality surveys.

TRAVEL TIME:

Andre Veilleux and Chris Diamantoukos were a task for within a task force in their analysis of partitioning in conjunction with syllabus and examination features which can be used to control travel time and the nature of fellows emerging from the system. Their work, which is reported in full as Appendix 4, identifies a number of tools which can be used to implement change:

- o Pass ratios
- o Syllabus content
- o Examination length (number of questions and hours)
- o Type of question (short answer vs. essay)
- o Type of test (open vs. closed book)
- o Passing standards (expect better performance on critical material)
- o Frequency of offering exams
- o Separation of examination units (for example, offer 3B only in February and August while continuing to offer 3a and 3c in May and November)

Three partitioning alternatives to stand alone units were examined using combinations of these tools. It is possible to construct others, but most of the relevant issues probably are revealed by exercising these abstractions. For clarity, "examination unit" refers to an individual examination that is a partition of an "examination group". An "examination group" corresponds to a part in the 1990 syllabus. "Minimum competency" means good enough to get by so long as proficiency is demonstrated by other means. "Minimum proficiency" means professional performance has been demonstrated, a higher standard than minimum competency.

Method A.

- 1) Overall passing score on exam group or,
- 2) Minimum competency on all exam units with minimum proficiency on exam unit(s) for which credit is received.

Method B.

- 1) Minimum proficiency on the exam unit or,
- 2) Minimum competency on all exam units with overall passing score on exam group.

Method C.

Minimum competency on exam units and an overall passing score which varies by the number of exam units taken.

With respect to quality control, we suggest examination units be subject to partitioned performance analysis, including travel time sensitivity calculations, for some period of time before final partitioning decisions are made.

Finally, measures of travel time can be somewhat ambiguous and it is preferable to use number of attempts over other procedures such as chronological distance from first attempt to last. Also, time to associatship and fellowship should be measured to the date the last exam passed was written, not the date results came out or the first meeting which follows.



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CORPORATE ACTUARIAL DEPARTMENT

RICHARD H. SNADER
VICE PRESIDENT-CORPORATE ACTUARY

September 6, 1989

TO: Members of the CAS Partitioned Exam Task Force
FROM: Richard H. Snader, Vice President-Corporate Actuary
RE: Examination Statistics

The program error described in my 8/22/89 letter has been corrected and the reports recompiled. The reports are arranged in packets as described in my 8/14/89 letter.

Packet #1 - FCAS, 1979-88 in numerical order
Packet #2 - FCAS, 1979-88 sorted by number of CAS administered exams taken
Packet #3 - FCAS, 1984-88 in numerical order
Packet #4 - FCAS, 1984-88 sorted by number of CAS administered exams taken

Statistics contained in the packets can be summarized as follows:

Packet #2	No. Recorded Exams	No. of Candidates	Average Travel Time
	6	100	4.6 years
	7	139	5.7
	8	80	8.3
	9	101	8.0
	10	80	8.1

Packet #4	No. Recorded Exams	No. of Candidates	Average Travel Time
	6	84	4.8 years
	7	101	5.7
	8	30	10.1
	9	30	10.4
	10	23	10.7

It appears as if we are getting a false indication from those individuals in packet #4 who took 8 or more CAS administered exams. We appear to be selecting individuals who started long ago but completed their exams only recently. The more typical experience of the recent FCAS would be to take only 6 or 7 CAS administered exams. Those taking 6 CAS exams would most likely have taken Part 4 when it was jointly administered with the SOA and the Joint Board.

Yours truly,

A handwritten signature in dark ink, appearing to read "Dick", is written below the typed name.

RHS:dmb
Attachments

CC: Gus Krause
Michael Toothman
Education and Testing Methods Task Force

RESULTS ---- Casualty Actuarial Exams

Appendix 1

	All Exams	

Total Attempts	6,239	
# Candidates taking more than one Exam	170	
Success Rate	55.5%	
Success Vs # of Attempts	350 out of	631
Total # Multiple Exam Settings	313	
# Candidates	500	
Exams Not Taken	187	
# Candidates Repeating an Exam	442	
# Repeat Exams	2,287	
Total # Exams	6,239	

SUMMARY

Casualty Actuarial Exams

	Exam #	Exam #	Exam #	Exam #	Exam #	Exam #	Exam #	Exam #	Exam #	Exam #	Exam #	Exams	
	1	2	3	4	5	6	7	8	9	10		Total	4 Thru 10
	-----											Exams	Only
Total Pass	161	216	253	355	463	477	500	498	499	500		3,922	3,292
Total Fail	26	47	55	214	225	228	363	345	454	360		2,317	2,189
Total Exams	187	263	308	569	688	705	863	843	953	860		6,239	5,481
Passing Ratio	86.1%	82.1%	82.1%	62.4%	67.3%	67.7%	57.9%	59.1%	52.4%	58.1%		62.9%	60.1%
Average Attempts	1.2	1.2	1.2	1.6	1.5	1.5	1.7	1.7	1.9	1.7		1.6	1.7
Exams Not Taken:													
Total Skipped	4	7	9	14	25	19	13	26	34	36		187	167

	Exam #	Exam #	Exam #	Exam #	Exam #	Exam #	Exam #	Exam #	Exam #	Exam #	Exam #
	1	2	3	4	5	6	7	8	9	10	

# Passing 1st Time	148	185	209	207	295	291	258	281	242	274	
# Passing 2nd Time	9	22	34	110	124	154	163	134	146	142	
# Passing 3rd Time	2	7	8	28	37	27	53	53	65	53	
# Passing 4th Time		2	2	8	6	5	20	21	23	22	
# Passing 5th Time		2		1	1		3	5	15	4	
# Passing 6th Time							2	2	4	2	
# Passing 7th Time								2	2	2	
# Passing 8th Time				1						1	
# Passing 9th Time											
# Passing 10th Time											1
# Passing 11th Time											
# Passing 12th Time										1	
# Passing 13th Time							1				

RESULTS ---- Casualty Actuarial Exams Exams
4 Thru 10
Only

Appendix 1

Total Attempts	5,481
# Candidates taking more than one Exam	170
Success Rate	1
Success Vs # of Attempts	350 out of 631
Total # Multiple Exam Sitzings	313
# Candidates	500
Exams Not Taken	167
# Candidates Repeating an Exam	441
# Repeat Exams	2,168
Total # Exams	5,481

SUMMARY

Casualty Actuarial Exams

	Exam # 4	Exam # 5	Exam # 6	Exam # 7	Exam # 8	Exam # 9	Exam # 10	Exams 4 Thru 10 Only
Total Pass	355	463	477	500	498	499	500	3,292
Total Fail	214	225	228	363	345	454	360	2,189
Total Exams	569	688	705	863	843	953	860	5,481
Passing Ratio	62.4%	67.3%	67.7%	57.9%	59.1%	52.4%	58.1%	60.1%
Average Attempts	1.6	1.5	1.5	1.7	1.7	1.9	1.7	1.7
Exams Not Taken: Total Skipped	14	25	19	13	26	34	36	167

	Exam # 4	Exam # 5	Exam # 6	Exam # 7	Exam # 8	Exam # 9	Exam # 10
# Passing 1st Time	207	295	291	258	281	242	274
# Passing 2nd Time	110	124	154	163	134	146	142
# Passing 3rd Time	28	37	27	53	53	65	53
# Passing 4th Time	8	6	5	20	21	23	22
# Passing 5th Time	1	1		3	5	15	4
# Passing 6th Time				2	2	4	2
# Passing 7th Time					2	2	2
# Passing 8th Time		1					1
# Passing 9th Time							
# Passing 10th Time							1
# Passing 11th Time							
# Passing 12th Time						1	
# Passing 13th Time				1			

Casualty Actuarial Exams

#	Not Taken	#	#	Candidate	Completion	# Multiple Exams			Exam	#	Exam	#	Exam	#	Exam	#	Exam	#	Exam	#
						Taken	Passed	Failed												
Six Exams																				
		5	6	8.0	1	Nov-88								1	2	4	2	1	1	
		3	6	4.0	2	Nov-82								2	2	2	1	1	1	
		2	6	3.5	18	May-85								2	1	1	1	1	2	
		1	6	4.0	26	May-86								1	2	1	1	1	1	
	2	3	6	3.5	29	May-84	2	2	2					1	1	1	3	1	2	
		4	6	4.5	31	Nov-85								1	2	2	1	2	2	
		3	6	4.0	33	Nov-84								1	1	2	1	2	2	
		3	6	4.5	43	May-87	1	1	1					2	1	1	2	1	2	
			6	2.5	46	May-83								1	1	1	1	1	1	
	1	2	6	4.0	48	May-84								1	2	1	2	1	1	
		4	6	5.0	49	Nov-85								2	2	2	1	2	1	
		6	6	8.0	57	May-87						1		2	1	2	2	2	3	
		7	6	7.0	60	May-88	1	1	1					3	1	2	4	1	2	
			6	2.5	63	May-83								1	1	1	1	1	1	
			6	2.5	64	May-85								1	1	1	1	1	1	
		4	6	4.0	67	Nov-86	1	1	1					1	1	2	1	3	2	
		4	6	4.5	69	May-87								1	2	2	1	2	2	
		9	6	7.0	70	Nov-88								2	2	3	1	3	4	
			6	2.5	73	Nov-83								1	1	1	1	1	1	
		2	6	4.5	94	Nov-86								1	1	2	1	2	1	
		5	6	5.5	104	May-87								1	2	2	2	2	2	
		2	6	3.5	110	May-85								2	2	1	1	1	1	
		2	6	4.5	111	May-85								1	1	1	2	2	1	
			6	2.5	120	May-83								1	1	1	1	1	1	
		3	6	4.5	123	May-85								1	1	2	2	2	1	
		3	6	4.5	125	May-87								2	2	1	1	1	2	
	1	3	6	4.5	126	May-81	1	1	1					1	2	1	2	1	2	
			6	3.0	127	May-85								1	1	1	1	1	1	
		5	6	5.0	130	Nov-87	1	1	1					1	1	2	2	3	2	
		2	6	4.0	131	Nov-86								1	1	2	1	2	1	
		3	6	4.0	150	Nov-84								1	2	3	1	1	1	
		4	6	5.0	156	May-87								1	2	2	3	1	1	
	11	6	8.0	157	Nov-88									3	2	3	2	3	4	
		9	6	9.5	177	Nov-82	1	2				2		2	2	2	6	1		
		2	6	4.5	180	Nov-85								1	1	1	1	3	1	
		2	6	4.0	183	May-86	1	2						1	2	1	2	1	1	
		4	6	4.5	184	May-85								2	1	1	2	2	2	
		3	6	4.0	185	Nov-84								1	2	1	1	3	1	
		4	6	4.5	187	May-85								1	2	3	1	1	2	
		2	6	4.5	190	Nov-85								1	1	3	1	1	1	
			6	3.5	192	May-85								1	1	1	1	1	1	
		1	6	3.5	205	Nov-86								1	1	2	1	1	1	
		3	6	4.5	206	May-85								1	1	1	2	2	2	
		1	6	3.5	208	May-86						1			1	1	1	1	2	
		6	6	7.5	209	Nov-86								1	1	1	4	2	2	
		3	6	3.5	210	Nov-84	1	1	1					1	2	2	1	2	1	
		1	6	3.5	211	May-86								1	1	1	1	1	2	
			6	2.5	222	May-82								1	1	1	1	1	1	
			6	2.5	224	Nov-83								1	1	1	1	1	1	

Casualty Actuarial Exams

Not Taken	# Failed	# Passed	# Years	Candidate #	Completion Date	# Multiple Exams			Exam #											
						Taken	Passed	Failed	1	2	3	4	5	6	7	8	9	10		
		7	6	6.5	226	Nov-87									3	3	2	1	2	2
		3	6	5.0	234	May-86									1	1	2	3	1	1
		1	6	3.0	238	Nov-83									2	1	1	1	1	1
		3	6	5.5	245	May-87									2	3	1	1	1	1
		7	6	6.0	246	Nov-87									2	2	3	2	2	2
		6	6	6.0	263	May-88									3	3	1	3	1	1
		3	6	4.0	264	Nov-85									2	2	2	1	1	1
		1	6	3.0	266	Nov-85									1	1	2	1	1	1
			6	2.5	272	May-83									1	1	1	1	1	1
		3	6	4.5	273	May-86									1	1	1	2	1	3
		5	6	4.5	288	May-85	1		2						1	3	2	1	2	2
		2	6	4.5	293	May-86									1	2	1	2	1	1
			6	2.5	296	Nov-84									1	1	1	1	1	1
1	1	6	6	3.5	301	May-84									2	1	1	1	1	1
3	2	6	6	5.0	313	May-84									1	2	1	1	2	1
		4	6	5.0	315	Nov-86									2	2	2	1	2	1
3	4	6	6	5.5	317	May-79						2			1	1	1	3	2	
2	2	6	6	5.5	321	May-88									1	1	2	1	2	1
1	2	6	6	3.5	328	May-84	1	1	1						1	1	1	1	2	2
			6	2.5	333	May-86									1	1	1	1	1	1
		3	6	4.5	338	Nov-85									1	2	2	1	2	1
		1	6	3.5	346	May-85									1	1	1	2	1	1
			6	2.5	347	May-86									1	1	1	1	1	1
		1	6	3.0	353	Nov-84									2	1	1	1	1	1
			6	2.5	354	May-84									1	1	1	1	1	1
		5	6	5.0	358	May-87									3	3	1	2	1	1
		6	6	5.5	362	Nov-87									2	2	3	1	1	3
5		6	6	5.5	364	May-84									1	1	1	1	1	1
		6	6	6.5	366	May-88									1	2	3	2	2	2
		4	6	5.5	378	Nov-86	1	1	1						1	1	2	2	3	1
		2	6	3.5	384	May-86									2	1	1	2	1	1
		6	6	5.5	396	Nov-87									3	2	1	2	2	2
		3	6	4.5	399	Nov-86									1	2	2	1	2	1
			6	2.5	400	Nov-83									1	1	1	1	1	1
		12	6	9.5	403	Nov-87							2	4	2	2	4	3	1	
		11	6	9.0	418	May-87							2	3	2	2	2	3	3	
		1	6	3.5	420	May-83									1	2	1	1	1	1
		2	6	3.5	421	May-85									1	1	1	1	2	2
		1	6	3.0	429	Nov-84									1	1	1	1	2	1
		8	6	6.5	436	May-86									1	2	3	4	3	1
1	1	6	6	3.5	438	May-84									1	2	1	1	1	1
		8	6	7.0	439	May-88									4	2	1	3	1	3
		9	6	9.0	443	Nov-87									3	2	3	2	3	2
		8	6	6.5	451	May-88									2	3	2	2	3	2
		7	6	7.5	465	Nov-88									1	2	3	1	3	3
		1	6	3.5	467	May-82									1	1	1	2	1	1
		5	6	6.0	470	May-86									1	2	2	3	1	2
		5	6	5.0	476	Nov-85									1	2	2	2	3	1
		2	6	4.0	477	Nov-84									2	1	1	1	2	1
		6	6	3.5	484	May-82	4	4	4						3	2	2	2	1	2

Casualty Actuarial Exams

#	Not Taken	# Failed	# Passed	# Years	Candidate #	Completion Date	# Multiple Exams			Exam #										
							Taken	Passed	Failed	1	2	3	4	5	6	7	8	9	10	
		5	6	6.0	491	May-88								1	1	3	2	2	2	
	20	331	600	4.6	100		17	18	16	1			10	142	151	163	152	164	148	
Seven Exams																				
	1	13	7	4.0	3	Nov-86								1	1	2	1	1	1	
	5	7	7	10.0	5	May-79	6	2	10	1	2	2	2	1	1	3	3	5		
		5	7	5.0	6	Nov-85								1	1	4	1	2	2	
		5	7	5.5	7	May-88								1	1	2	3	3	1	
			7	3.0	10	May-87								1	1	1	1	1	1	
			7	3.5	12	May-80								1	1	1	1	1	1	
	2	5	7	7.5	15	May-81						1	2	2	1	3	1	2		
	2	2	7	5.0	19	May-84						1	1	2	1	2	1	1		
		7	7	8.5	28	May-87	1	1	1	1			3	2	1	3	2	2		
		3	7	4.0	34	Nov-84	1	2					1	2	1	2	2	1	1	
		1	7	4.5	38	May-88							2	1	1	1	1	1	1	
			7	3.0	40	Nov-83							1	1	1	1	1	1	1	
	4	1	7	5.5	44	May-84				1				1	2	1	1	1	1	
		1	7	3.0	45	May-88	1	1	1				1	1	1	1	2	1	1	
			7	3.0	47	Nov-83							1	1	1	1	1	1	1	
	10	11	7	13.0	52	May-84	1	1	1				2	3	3	1	2	4	3	
	1	10	7	8.5	53	May-84							2	1	1	1	1	7	4	
		5	7	6.0	54	Nov-87							1	1	2	2	2	3	1	
		7	7	6.5	59	May-85	1	2					1	1	1	1	2	4	3	
		1	7	3.0	65	Nov-84							1	2	1	1	1	1	1	
			7	3.0	68	May-82							1	1	1	1	1	1	1	
			7	3.5	72	May-85							1	1	1	1	1	1	1	
		2	7	4.5	80	May-83							1	1	1	1	1	2	2	
			7	3.0	82	Nov-85							1	1	1	1	1	1	1	
		1	7	3.5	83	May-82							1	1	1	2	1	1	1	
		1	7	5.5	85	Nov-83				1				1	1	1	1	2	1	
			7	3.0	87	May-87							1	1	1	1	1	1	1	
		1	7	3.5	90	May-88							1	1	1	2	1	1	1	
	11	7	7	8.5	92	May-80	3	3	3				1	3	3	2	3	3	3	
			7	3.0	93	May-88							1	1	1	1	1	1	1	
		1	7	3.5	95	May-88							1	1	1	2	1	1	1	
		3	7	5.5	100	May-80							1	3	1	1	1	1	2	
		3	7	5.0	105	May-87							1	1	1	1	2	2	2	
		6	7	6.5	106	Nov-88							2	2	1	2	1	3	2	
		7	7	10.0	107	May-88							3	1	1	4	3	1	1	
	2	6	7	9.0	109	May-80							1	1	2	2	2	1	2	
		1	7	4.5	112	May-87							1	2	1	1	1	1	1	
		9	7	9.5	121	May-86	2	1	3				3	2	1	1	4	1	4	
	2	7	7	8.5	128	Nov-86							1	1	3	2	1	2	3	
		3	7	4.5	140	May-88							1	1	1	3	1	1	2	
			7	3.0	141	May-80							1	1	1	1	1	1	1	
		7	7	5.5	145	May-87	4	3	5				1	2	4	2	3	1	1	
			7	4.5	161	May-83							1	1	1	1	1	1	1	
		4	7	6.5	163	May-88							1	3	2	2	1	1	1	
		7	7	6.5	168	May-85	2	2	2				1	2	3	4	2	1	1	

Casualty Actuarial Exams

#	Not Taken	#	#	Candidate	Completion	#	# Multiple Exams			# Exams									
							Failed	Passed	Failed	1	2	3	4	5	6	7	8	9	10
#	Failed	Passed	Years	#	Date	Taken	Passed	Failed	1	2	3	4	5	6	7	8	9	10	
		7	3.0	172	May-88								1	1	1	1	1	1	
	3	7	5.0	173	May-88								2	1	1	2	1	2	
	2	7	4.0	175	Nov-86								2	1	1	2	1	1	
	6	7	7.5	176	May-88								1	2	2	2	2	2	
	4	7	5.0	178	May-88								3	2	1	2	1	1	
	3	7	4.5	181	May-82	2	2	2					1	1	1	1	3	1	
	1	7	4.0	189	May-88								2	1	1	1	1	1	
	1	7	6.5	193	May-79	1	2						1	1	1	1	2	1	
1	5	7	6.0	196	May-84								2	1	2	2	2	1	
	2	7	2.5	197	May-80	3	4	2					1	1	2	1	2	1	
	2	7	4.5	203	May-86								1	1	1	2	2	1	
	4	7	7.5	215	May-86	1	1	1	1					1	1	2	1	2	
5	7	7	9.0	217	May-84					1			2	1	2	1	1	4	
2	4	7	9.5	218	Nov-82						2	1	1			2	2	3	
		7	3.5	221	May-87								1	1	1	1	1	1	
	8	7	8.5	223	Nov-81							2	1		2	4	1	2	
		7	3.0	227	May-88								1	1	1	1	1	1	
	6	7	7.0	229	Nov-87								1	3	1	4	2	1	
1	9	7	7.5	230	Nov-86	1	2						2	3	2	1	1	3	
	1	7	3.5	235	Nov-86								1	1	1	2	1	1	
	4	7	6.5	239	May-82							1	1	1	2	1	2	1	
	4	7	5.5	242	May-86								2	1	2	2	1	2	
	4	7	5.0	243	May-88	1	2						1	2	2	1	2	1	
4	9	7	10.0	244	May-84	1		2					1	1	3	1	2	4	
		7	3.0	248	May-88								1	1	1	1	1	1	
	1	7	3.5	252	Nov-81								1	1	1	1	1	2	
	4	7	4.5	259	May-81								2	1	2	1	1	2	
	2	7	5.0	261	May-83								1	1	1	1	3	1	
	1	7	3.5	267	May-86								1	1	1	1	2	1	
		7	6.0	275	May-84					1				1	1	1	1	1	
	1	7	4.0	281	May-81	2	4						1	1	1	1	2	1	
	6	7	5.0	282	Nov-87	3	3	3					1	2	2	3	1	2	
		7	5.5	283	Nov-83					1				1	1	1	1	1	
	10	7	8.5	284	May-86								1	4	2	1	5	3	
	5	7	7.0	285	Nov-85						1			1	2	2	1	3	
1	4	7	9.5	287	Nov-88								1	2	1	2	1	3	
	2	7	4.5	291	May-86								2	2	1	1	1	1	
	4	7	6.5	299	May-85						1			1	1	3	2	1	
	1	7	3.5	300	May-86								1	1	2	1	1	1	
		7	3.0	307	May-88								1	1	1	1	1	1	
1	1	7	4.0	309	May-82	1	2						1	1	1	1	2	1	
	1	7	3.5	310	May-87								1	2	1	1	1	1	
	13	7	9.5	312	Nov-85	2	2	2					1	1	3	1	1	8	
	3	7	5.0	322	May-88								2	1	2	2	1	1	
	4	7	5.5	325	May-88								1	1	2	1	3	2	
		7	3.0	335	May-79								1	1	1	1	1	1	
3	2	7	5.5	336	May-84						1			2	1	1	1	2	
1	9	7	12.5	337	Nov-84	1	1	1				1	2	3		2	1	3	
	7	7	7.0	339	Nov-88							1	1	1	2	3	2	3	
	2	7	4.0	345	Nov-80								1	1	1	2	1	2	

Casualty Actuarial Exams

Not Taken	#	#	#	Candidate	Completion	# Multiple Exams			#	#	#	#	#	#	#	#	#	#	#						
						Taken	Passed	Failed																	
		3	7	4.5	349	May-88						1	1	1	2	2	2	1							
		2	7	4.0	352	May-82						1	1	1	2	1	1	2							
		10	7	13.5	360	May-87						1	2		1	4	3	2	4						
		1	7	4.0	363	May-81						1	1	2	1	1	1	1	1						
		2	7	4.5	369	May-87						1	1	2	1	2	1	1	1						
		10	7	9.5	371	May-82	1	1	1			1	2	2	1	3	3	3	2						
		2	7	4.0	373	May-88						1	1	1	2	1	1	2							
		6	7	9.5	376	May-88					1		2	3	1	2	2	2							
1		5	7	8.5	387	May-88						1	2	2	2	2	1	2							
2		2	7	6.0	389	May-84						1	2	1	1	2	1	1							
		1	7	8.0	394	May-86					1		1	1	1	1	1	2							
		6	7	6.5	395	May-85						1	2	1	1	2	3	3							
		2	7	4.5	398	May-87						2	1	1	1	2	1	1							
			7	3.0	406	May-87						1	1	1	1	1	1	1							
		4	7	5.0	408	Nov-87						2	1	1	2	1	2	2							
		6	7	7.0	411	May-80						1	2	1	1	1	2	2	3						
		2	7	6.5	412	Nov-88						1	1	2	2	1	1	1							
		2	7	4.5	415	May-87						1	1	1	2	2	1	1							
		7	7	5.5	417	Nov-85	2	1	3			1	3	1	4	2	1	2							
		4	7	6.0	422	May-87						3	2	2	1	1	1	1							
			7	4.5	423	May-83						1		1	1	1	1	1							
			7	3.0	431	May-86						1	1	1	1	1	1	1							
			7	3.0	437	Nov-85						1	1	1	1	1	1	1							
		2	7	5.0	441	May-88						1	2	1	1	1	1	2							
1		8	7	8.0	445	Nov-79	4	3	5			2	2	2	1	3		4	1						
		5	7	5.5	447	May-88						2	3	1	1	1	1	3							
		3	7	4.5	448	May-87						1	1	2	1	1	2	2							
		1	7	4.0	452	Nov-87						1	1	1	2	1	1	1							
		2	7	4.5	453	Nov-87						1	2	1	2	1	1	1							
1			7	3.5	454	May-84						1	1	1	1	1	1	1							
		3	7	5.0	455	May-88						3	1	1	1	1	2	1							
		4	7	7.5	459	May-88						3	1	1	2	1	2	1							
		4	7	10.5	460	May-87					1		2	1	1	3	2	1							
		1	7	3.5	461	May-87						1	2	1	1	1	1	1							
		9	7	9.0	475	Nov-81						1	2	1	1	2	3	3							
		4	7	2.5	479	May-87	5	6	4			2	1	1	2	1	2	2							
1		4	7	5.0	480	May-84	1	1	1			1	2	2	2	1	1	2							
		5	7	9.5	481	May-88						1		1	2	2	3	2	1						
		1	7	5.5	485	Nov-88						1	1	1	1	1	2	1							
		7	7	10.5	486	May-87						1		2	2	3	3	1	2						
		2	7	4.0	495	May-82						1	2	2	1	1	1	1							
		1	7	3.0	496	May-82						1	1	2	1	1	1	1							
3		9	7	16.0	497	Nov-82	1	1	1			2	4		2	1	2	2	2						
		2	7	4.0	499	May-87						1	2	2	1	1	1	1							
		52	484	973	5.7	139						56	58	54	14	14	23	162	189	183	217	211	223	221	
		Eight Exams																							
		7	8	8.5	8	May-86						1		2	1	3	2	2	3	1					
		6	8	9.5	11	May-87						1		4	2	1	3	1	1	1					

Casualty Actuarial Exam

Not Taken	#	#	#	Candidate #	Completion Date	# Multiple Exams			# Exams											
						Taken	Passed	Failed	1	2	3	4	5	6	7	8	9	10		
		3	8	6.0	17	Nov-79					1	1	1			2	2	1	2	1
		9	8	9.0	21	May-82					2	1	1	1	1	2	1	2	3	4
		7	8	13.0	25	Nov-81					2	1	1	1	1	3	1	4	1	
1		5	8	8.0	37	Nov-84				1			1	1	1	2	3	3	1	
		1	8	4.5	39	May-83						1	1	1	1	1	2	1	1	1
2		11	8	8.5	50	May-80	3	1	5		2	3	2	1		1	4	2	4	
		1	8	4.0	66	Nov-82						1	1	1	1	2	1	1	1	1
2		5	8	7.0	75	May-84					1		2	1	1	1	1	3	3	
		3	8	12.0	76	May-86				1	1				1	1	2	1	2	2
		3	8	5.0	78	Nov-81						1	1	1	1	1	1	1	3	2
		7	8	7.5	81	May-80					1	1	2	2		2	2	2	3	
		4	8	9.0	98	Nov-85				1	1				1	1	4	1	1	2
		8	8	8.0	108	May-85						1	2	3	1	2	2	2	3	
1		1	8	3.5	116	May-81	1	2			1	1	1	1	1	1	1	1	1	1
		5	8	6.5	118	Nov-79					1	1	2			1	1	1	4	2
3		7	8	13.0	129	Nov-86						2	4		2	1	1	3	2	
		1	8	4.5	132	May-82						1	1	1	1	1	1	1	1	2
		24	8	15.5	137	Nov-88	4	5	3		1	1	1	1		3	3		12	10
		7	8	9.5	138	May-88					1			1	2	2	3	1	3	
1		10	8	9.5	146	Nov-82					1	2	2	1	1	2	1	5	3	
		6	8	7.0	147	May-83						1	1	1	1	2	3	3	2	
		1	8	4.0	162	Nov-82						1	1	1	1	2	1	1	1	1
1		4	8	6.0	164	Nov-82					1	1	1	1	1	3	1	2	1	
		12	8	9.5	169	May-82	1	1	1		2	2	2		2	2	2	4	4	
		5	8	11.0	170	Nov-88				1	1				2	1	2	1	2	3
		3	8	7.0	171	May-85						1	2	1	1	3	1	1	1	1
1		22	8	17.0	174	Nov-86	6	1	11		1	2	4	1	1	2	13	1	4	1
		7	8	8.0	179	May-85						1	1	1	2	1	3	4	2	
		7	8	8.0	198	Nov-81					1	1	1	1	1	2	3	4	1	
		5	8	6.0	207	May-82						1	2	1	1	2	2	2	2	2
		2	8	8.0	231	May-86				1	1				1	1	1	2	2	
		2	8	5.0	237	Nov-81						1	2	1	1	1	1	2	1	
		8	8	10.0	247	May-83						1	1		2	2	3	2	3	
		8	8	8.0	249	May-83	1	2				1	2	2	1	1	4	3	2	
		2	8	4.5	250	May-82						1	1	1	1	2	1	1	2	
10		8	12.0	255	Nov-86					1		2	5	2	2	2	2	2	2	
11		8	11.5	260	Nov-80					1	1	2	2	2	1	3	1	4	2	
		3	8	4.5	270	Nov-80	2	3	1			1	1	1	1	3	1	2	1	
		2	8	7.0	279	Nov-82				1			1	2	1	2	1	1	1	1
		7	8	7.5	280	May-86	1	1	1		1		1	2	2	2	4	2	1	
5		15	8	12.5	289	May-83	3		6		2		2	8	3	3	2	1	1	1
		5	8	6.5	294	May-82						1	1	2	1	1	4	2	1	
		8	8	7.5	298	May-79	1	1	1		1	2	2	2	2	2	2	2	1	
		2	8	8.0	304	May-79	1	2			1		1	1	1	1	2	1	2	
		7	8	11.0	311	Nov-87					1		1		3	2	3	2	1	
		6	8	10.0	314	May-88						1		1	3	1	2	2	2	2
14		8	9.5	327	May-82	4	3	5			1	2	3	2	1	3	6	3	1	
			8	6.5	331	May-82						1	1	1	1	1	1	1	1	1
		15	8	11.0	340	Nov-82	2	1	3		1	2	2	3	1	5	3	3	3	
8		7	8	10.0	341	May-84	2	1	3		1		2	1	3	1	4	1	2	

Casualty Actuarial Exams

#	Not Taken	# Failed	# Passed	Candidate Years	Candidate #	Completion Date	# Multiple Exams			Exam 1	Exam 2	Exam 3	Exam 4	Exam 5	Exam 6	Exam 7	Exam 8	Exam 9	Exam 10
							Taken	Passed	Failed										
		6	8	7.5	343	Nov-81				1	1	1			2	2	1	3	3
		10	8	8.5	348	Nov-86	1		2			1	2	3	1	3	1	3	4
		2	8	6.5	350	Nov-83				1	1			1	2	2	1	1	1
		6	8	8.0	355	May-82						2	1	2	1	1	2	2	3
1		2	8	5.0	356	May-82						1	1	1	1	1	1	2	2
1		17	8	16.5	359	Nov-86	1	1	1	1		3	2	1	2	6	1	3	6
			8	4.0	379	May-81						1	1	1	1	1	1	1	1
		9	8	10.5	380	Nov-88						1	2	2	1	2	2	6	1
		11	8	12.0	381	Nov-80				1		1	2	2	3	4	2	1	3
		4	8	9.0	382	May-87				1		2	1	2	1	2	2	2	1
1		8	8	6.5	385	May-82	3	2	4			1	1	2	2	1	4	2	3
		3	8	7.5	388	May-79				1	1			1	2	2	1	1	2
		7	8	12.0	402	May-87				1	1			3	1	1	4	2	2
		2	8	8.5	414	May-86				1	1			1	1	2	2	2	1
1		5	8	6.0	424	May-79	1	1	1	1	1	1	1	1	1	1	4	1	2
		6	8	9.5	425	May-87	2	3	1	1	1			1	1	3	3	1	3
3		3	8	6.5	426	May-84						1	2	1	1	2	1	2	1
1		3	8	11.5	430	Nov-82					1	1	1	1	1	1	1	3	1
		12	8	10.0	458	May-82	1	1	1	1	1	2	2	4	5	1	1	3	
		4	8	5.5	462	May-82	1	1	1	1		1	3	2	1	2	1	1	1
		8	8	10.0	466	Nov-87					1	1		2	1	3	2	3	3
		8	8	7.0	468	May-82	1	1	1	1		1	2	3	3	2	1	2	2
		14	8	9.5	472	May-81	5	4	7			2	2	2	4	1	4	1	6
		3	8	6.5	483	Nov-80					1	1	1		1	1	1	3	2
		5	8	6.0	489	Nov-83	1	2				1	1	1	2	2	1	3	2
		10	8	11.5	493	May-88	1	1	1	1	1		1	1	2	3	3	2	4
			8	5.0	494	Nov-82				1	1			1	1	1	1	1	1
		4	8	5.0	498	Nov-82	1	2				1	1	1	1	2	2	3	1
33	513	640	8.3	80			51	43	60	27	47	74	110	110	116	168	149	184	168
Wide Exams																			
		10	9	12.5	4	May-83	1	2		1	1	2	1	2	2	1	1	4	4
		2	9	11.5	13	May-86				1	1	1		1	1	1	1	2	2
		4	9	10.5	22	Nov-85					1	1	1	1	1	3	2	2	1
1		1	9	5.5	23	Nov-79					1	1	1	1	1	2	1	1	1
		4	9	7.0	24	May-83	1	1	1	1		1	2	2	1	2	2	1	1
		4	9	8.0	36	May-79	1	3		1	1	1	1	1	3	4	1		
2		3	9	6.5	42	May-84					1	1	1	2	1	1	2	2	1
		3	9	5.5	51	May-83					1	1	1	2	1	2	2	1	1
		2	9	6.5	61	May-83					1	1	1	1	2	2	1	1	1
			9	5.0	62	May-81				1		1	1	1	1	1	1	1	1
		7	9	8.0	74	May-81	3	4	2	1	1		2	1	2	1	3	2	3
3		17	9	13.5	77	Nov-84	5	3	7	1	2	3	3	2	1	4	3	5	2
		13	9	9.5	91	May-81					3	3	4	1	3	2	1	3	2
		9	9	10.5	96	May-81	1		2	1	1	2	2	1		2	5		4
			9	4.0	103	May-81	1	2			1	1	1	1	1	1	1	1	1
		9	9	15.5	113	May-88	1	2		1	1	2	2		2	5	1	1	3
		2	9	3.5	114	Nov-79	3	5	1		1	1	1	1	1	2	1	1	2
		3	9	9.0	115	Nov-83				1		1	1	1	2	1	1	2	2

Casualty Actuarial Exams

Not Taken	# Failed	# Passed	# Years	Candidate #	Completion Date	# Multiple Exams			# Exams												
						Taken	Passed	Failed	1	2	3	4	5	6	7	8	9	10			
		5	9	7.5	117	May-82					1	1	1	2	1	1	3	2	2		
		13	9	12.0	133	Nov-86					1	2	3	1	1	3	1	7	3		
1		10	9	9.0	134	May-82	3	2	4		2	2	4	2	2	1	3	1	2		
		4	9	8.5	136	Nov-84					1	1	1	2	1	1	1	4	1		
		1	9	5.0	139	May-82					1	1	1	1	1	1	1	1	2		
1		19	9	16.5	144	May-87				1	1	1	3	2		3	6	6	5		
		1	9	4.5	148	May-79					1	1	1	2	1	1	1	1	1		
		7	9	8.5	149	May-86					1	1	2	2	2	1	1	2	4		
		1	9	6.5	151	May-82					1	1	1	2	1	1	1	1	1		
		8	9	8.0	152	Nov-84	2		4	1		1	2	2	2	3	2	2	2		
1		6	9	8.5	153	May-80					2	2	2	2	2	2	1	1	1		
3		5	9	8.0	154	May-84					1	1	2	2	1	1	1	2	3		
		3	9	6.5	158	May-82	1	2			1	1	1	1	1	2	3	1	1		
1		1	9	4.0	159	Nov-79	2	4			1	1	1	1	1	1	1	1	2		
		9	9	10.0	160	May-87	2	1	3		1	1	1	2	2	2	5	2	2		
		8	9	7.0	165	May-79	3	4	2		1	1	2	2	1	2	1	3	4		
		5	9	9.5	182	Nov-81				1	2	1		2		3	2	1	2		
		9	9	10.5	186	May-87				1	1	1	1	1	2	2	3	3	3		
		2	9	7.0	191	May-82				1	1	1	1	2	1	1	1	1	2		
			9	4.5	194	May-81					1	1	1	1	1	1	1	1	1		
1		3	9	6.0	199	May-79	2	4		1	1	1	1	1	2	2	2	2	1		
			9	4.0	201	May-80					1	1	1	1	1	1	1	1	1		
1		23	9	10.5	212	May-81	11	7	15	1	3	3	2	3		6	3	4	7		
1		5	9	7.0	219	Nov-81	1	1	1		1	1	2	1	2	2	1	2	2		
		1	9	7.0	225	May-85	1	2		1	1		1	1	2	1	1	1	1		
		1	9	5.5	232	May-79					1	1	1	1	1	1	1	1	2		
		2	9	4.5	233	May-81	1	2			1	1	1	1	1	1	2	2	1		
		6	9	8.0	236	Nov-83					1	1	2	1	1	1	1	5	2		
		9	9	11.5	240	May-86	1	2			1	1	2	4	2	1	4	2	1		
10		9	9	9.5	241	Nov-83					1	1	2		1	4	2	5	3		
		3	9	6.5	251	May-81	1	1	1	1	1		1	2	2	1	1	2	1		
		6	9	6.5	253	Nov-79	1	1	1	1	1	1	1	1	2	3	1	3	2		
		3	9	7.0	256	Nov-80				1	1	1	1		1	1	1	4	1		
		2	9	3.5	262	May-79	3	5	1		1	1	1	1	1	2	2	1	1		
		1	9	4.5	265	May-81				1	1	1	1	1	2	1	1	1	1		
11		9	7.5	271	Nov-81	5	4	6	1		1		2	3	2	1	4	1	4	2	
		6	9	6.5	276	May-80	1	1	1	1		1	2	2	1	3	1	1	2	2	
		3	9	5.0	286	May-81	1	2			1	1	2	1	1	1	1	2	2		
1		4	9	6.0	290	May-80	1	2		1	1	1	2		2	1	1	2	2		
		6	9	4.0	292	May-79	5	5	6		1	1	1	1	1	2	3	2	2	2	
1		7	9	7.5	295	May-80	2	1	3	1	3	2	2	1	1	2	2	1	1		
1		9	9	9.5	305	May-80				1	2	2	2		2	2	1	2	4		
1		13	9	12.5	308	Nov-80	3	4	2	2	1	2	1	2	3	2	1	5	3		
		4	9	11.0	318	May-80				1	1	1	1		2	2	2	1	2		
10		9	9	12.5	320	Nov-88				1	1	1		2	3	1	2	6	2		
		1	9	6.0	324	May-83					1	1	1	2	1	1	1	1	1	1	
		5	9	7.5	326	May-83	1	2		1	1	1		1	3	2	2	2	1		
3		6	9	11.0	329	Nov-85	1	2		1	1		2	2	2	1	2	2	2		
1		11	9	14.5	330	May-87	1	2		1	1	1	2		2	2	4	4	3		
1		4	9	7.5	334	May-85					1	1	2	1	2	1	2	2	2	1	

Casualty Actuarial Exams

Not Taken	#	#	#	Candidate Years	Completion #	Completion Date	# Multiple Exams			# Exams										
							Taken	Passed	Failed	1	2	3	4	5	6	7	8	9	10	
	2	8	9	9.0	342	May-84				1			1	1	2	2	4	2	1	3
		2	9	6.5	344	May-83					1		1	1	2	1	2	1	1	1
	2	11	9	6.5	351	Nov-79	4	2	6	1	2	1	3	2	2	4	1	1	1	3
	5	13	9	12.0	367	May-84	2	3	1	1	1	1	3	2		2	4	5	3	
		8	9	9.5	368	Nov-85					1		1	2	2	1	4	2	2	2
		7	9	8.5	370	May-86				1			1	2	2	1	2	3	3	
	2	5	9	9.0	377	May-81	2	3	1		1	1	2	2	2	2	1	1	2	
		3	9	4.5	383	May-79	3	4	2			1	1	1	1	1	2	2	2	
		6	9	6.5	386	Nov-79	1	2			2	1	2	1	1	1	1	3	3	
		5	9	7.5	390	Nov-80				1	1	1	1			2	4	1	2	
		4	9	6.0	391	Nov-84	1	2			1	1	1	1	1	2	2	1	3	
	1	8	9	6.0	392	May-80	5	4	7	1	1	2	1		3	2	3	2	2	
		9	9	8.0	393	Nov-79	1		2		3	3	3	2	2	2	1	1	1	
		10	9	10.0	401	May-83				1	1	1	1	1	2	2	2	3	5	
		3	9	9.0	404	May-81	2	4			1	1	1	2	1	1	2	1	2	
		13	9	12.0	416	May-83				3	1	1	2		1	3	1	3	7	
	1	14	9	11.5	427	Nov-84					2	1	2	3	2	2	5	4	2	
		10	9	9.5	433	May-84					1	1	1	1	1	3	5	4	2	
	1	5	9	9.0	444	May-82	1	2		1	1	1		1	3	1	2	3	1	
		10	9	11.5	449	May-87				1	1	1	1	2	2	3	3	3	2	
	1	9	9	11.5	456	May-87	1	1	1	1	1		1	3	1	1	4	5	1	
	4	6	9	8.5	457	May-84	1	1	1		1	1	2	2	2	1	2	2	2	
			9	4.5	463	May-81					1	1	1	1	1	1	1	1	1	
		3	9	6.5	464	May-79				1	1	1	1	1	2	1	1	2	2	
		1	9	5.0	469	Nov-83					1	1	1	1	2	1	1	1	1	
		1	9	5.5	473	May-82					1	1	1	1	1	1	2	1	1	
		9	9	11.0	474	Nov-82	1	1	1	1	1	1	2	3	1	2	2	4	1	
		5	9	7.5	478	May-82					1	1	1	1	1	2	3	2	2	
		2	9	4.0	487	Nov-82	2	3	1	1	1		1	1	1	1	1	2	2	
	11	9	12.0	490	Nov-86						1	1	3	3	2	3	2	4	1	
		1	9	4.0	492	Nov-80	1	2			1	1	1	1	1	2	1	1	1	
		7	9	7.0	500	May-80	2	1	3		1	1	3	1	1	2	3	2	2	
		6	9	7.5	501	May-83	2	1	3		1	2	2	1	2	1	1	1	4	
44	600	909	8.0	101			107	122	95	49	107	117	152	135	148	188	187	224	202	

Ten Exams

	1	10	12.5	9	Nov-87					1	1	1	1	1	1	1	1	2	1
		8	10	8.5	14	Nov-86	1	2		1	1	1	2	1	4	1	1	5	1
	1	1	10	5.5	16	May-82	1	2		1	1	1	1	1	1	1	2	1	
	1	8	10	7.5	20	May-79	2	2	2	2	3	1	4	1	1	1	2	2	1
		2	10	5.0	27	May-80	1	2		1	1	1	1	1	1	2	1	1	2
	1	3	10	7.5	30	May-83				1	1	1	1	1	1	1	1	2	3
		6	10	8.5	32	Nov-84	1	2		1	1	1	1	2	2	2	2	3	1
		4	10	8.5	35	May-83				1	1	1	2	2	1	1	3	1	1
	14	10	12.0	41	Nov-82	3	2	4		5	2	1	4	4		2	2	3	1
	1		10	4.0	55	May-79	3	6		1	1	1	1	1	1	1	1	1	1
		1	10	6.0	56	Nov-80				1	1	1	1	1	1	2	1	1	1
		6	10	10.0	58	May-82				1	1	2	3	3	1	1	1	2	1
	1	4	10	10.0	71	Nov-87				1	1	1	1	2	1	3	2	1	1

Casualty Actuarial Exams

#	Not Taken	#	#	#	Candidate #	Completion Date	# Multiple Exams			Exams									
							Taken	Passed	Failed	1	2	3	4	5	6	7	8	9	10
							Six Exams												
		5	6	8.0	1	Nov-88								1	2	4	2	1	1
		3	6	4.0	2	Nov-82								2	2	2	1	1	1
		2	6	3.5	18	May-85								2	1	1	1	1	2
		1	6	4.0	26	May-86								1	2	1	1	1	1
	2	3	6	3.5	29	May-84	2	2	2					1	1	1	3	1	2
		4	6	4.5	31	Nov-85								1	2	2	1	2	2
		3	6	4.0	33	Nov-84								1	1	2	1	2	2
		3	6	4.5	43	May-87	1	1	1					2	1	1	2	1	2
			6	2.5	46	May-83								1	1	1	1	1	1
	1	2	6	4.0	48	May-84								1	2	1	2	1	1
		4	6	5.0	49	Nov-85								2	2	2	1	2	1
		6	6	8.0	57	May-87							1	1	1	2	2	2	3
		7	6	7.0	60	May-88	1	1	1					3	1	2	4	1	2
			6	2.5	63	May-83								1	1	1	1	1	1
			6	2.5	64	May-85								1	1	1	1	1	1
		4	6	4.0	67	Nov-86	1	1	1					1	1	2	1	3	2
		4	6	4.5	69	May-87								1	2	2	1	2	2
		9	6	7.0	70	Nov-88								2	2	3	1	3	4
			6	2.5	73	Nov-83								1	1	1	1	1	1
		2	6	4.5	94	Nov-86								1	1	2	1	2	1
		5	6	5.5	104	May-87								1	2	2	2	2	2
		2	6	3.5	110	May-85								2	2	1	1	1	1
		2	6	4.5	111	May-85								1	1	1	2	2	1
			6	2.5	120	May-83								1	1	1	1	1	1
		3	6	4.5	123	May-85								1	1	2	2	2	1
		3	6	4.5	125	May-87								2	2	1	1	1	2
	1	3	6	4.5	126	May-81	1	1	1					1	2	1	2	1	2
			6	3.0	127	May-85								1	1	1	1	1	1
		5	6	5.0	130	Nov-87	1	1	1					1	1	2	2	3	2
		2	6	4.0	131	Nov-86								1	1	2	1	2	1
		3	6	4.0	150	Nov-84								1	2	3	1	1	1
		4	6	5.0	156	May-87								1	2	2	3	1	1
	11	6	8.0	157	Nov-88									3	2	3	2	3	4
		9	6	9.5	177	Nov-82	1	2					2	2		2	2	6	1
		2	6	4.5	180	Nov-85								1	1	1	1	3	1
		2	6	4.0	183	May-86	1	2						1	2	1	2	1	1
		4	6	4.5	184	May-85								2	1	1	2	2	2
		3	6	4.0	185	Nov-84								1	2	1	1	3	1
		4	6	4.5	187	May-85								1	2	3	1	1	2
		2	6	4.5	190	Nov-85								1	1	3	1	1	1
			6	3.5	192	May-85								1	1	1	1	1	1
		1	6	3.5	205	Nov-86								1	1	2	1	1	1
		3	6	4.5	206	May-85								1	1	1	2	2	2
		1	6	3.5	208	May-86								1	1	1	1	1	2
		6	6	7.5	209	Nov-86								1	1	4	2	2	1
		3	6	3.5	210	Nov-84	1	1	1					1	2	2	1	2	1
	1	6	3.5	211	May-86									1	1	1	1	1	2
			6	2.5	222	May-82								1	1	1	1	1	1
			6	2.5	224	Nov-83								1	1	1	1	1	1

Casualty Actuarial Exams

Not Taken	#	#	#	Candidate #	Completion Date	# Multiple Exams			Exam #	Exam #	Exam #	Exam #	Exam #	Exam #	Exam #	Exam #	Exam #
						Taken	Passed	Failed									
6		10	7.5	407	May-84				1	1	1	1	1	1	1	1	1
	7	10	11.5	409	May-85				1	1	1	2	3	1	2	4	1
	7	10	8.5	410	May-84	2	4		1	1	1	2	2	2	1	1	3
	4	10	7.5	413	May-85				1	1	1	1	2	2	1	2	2
	1	10	5.0	419	May-81	2	4		1	1	1	1	1	2	1	1	1
	6	10	7.0	428	May-82	1	1	1	1	1	1	2	1	1	2	1	4
	2	10	6.0	432	May-80				1	1	1	2	1	1	1	2	1
	3	10	6.0	434	May-79	1		2	2	2	1	2		1	1	1	2
	4	10	8.5	435	Nov-83	1	2		1	1	1	3	1	1	1	1	2
	3	10	9.0	440	Nov-82	1	2		1	1	1	1	1	1	3	1	2
	3	10	10.0	442	May-80				1	1	1	2	1	1	2	2	1
	9	10	12.0	450	May-86				1	1	1	1	2	2	3	3	2
		10	6.5	471	Nov-79	1	2		1	1	1	1	1	1	1	1	1
	4	10	7.0	482	May-82	2	4		1	1	1	1	1	1	1	4	2
1	3	10	7.5	488	May-79				1	2	1	2	1	1	1	1	2
38	389	800	8.1	80		82	109	56	96	95	94	135	112	107	127	144	158

1600 Arch Street
Philadelphia, PA 19103
(215) 523-4000

Appendix 1



September 26, 1989

RECEIVED

Richard H. Snader
Vice President—Corporate Actuary
United States Fidelity and Guaranty Company
P. O. Box 1138
Baltimore, Maryland 21203

OCT 05 1989
CORPORATE ACTUARIAL
DEPARTMENT

RE: Examination Statistics

Dear Dick:

I have reviewed the revised Examination Statistics that were attached to your letter of September 6th and created a different analysis of empirical Travel Times. My focus was on the number of examination sittings beyond Part 3 required to obtain Fellowship. This seemed to be the basic agreed upon definition formulated at the PETF meeting this past May 22nd. The analysis is attached and hopefully I have not made any mechanical errors.

The final column represents an estimate of the number of sittings sought for. As indicated, it is the sum of the average sittings per candidate/Fellow past Part 4 plus the average number of sittings for Part 4 per candidate only for those candidates that passed Part 4 of the CAS administered examination as indicated in your packet #3.

My reaction to the "trend" is that Travel Time has not changed materially over the past few years. Based on your comment on the "false indication" caused by individuals who started long ago, it may also be the case that a final steady-state candidate population has not been obtained. That is to say, there is an "age mix" bias that exists over time that may be causing some of the trends that we are witnessing.

Upon further reflection, I came to the conclusion that the lack of a strong trend in Travel Time as measured by examination sittings is to be expected. This is a direct result of some stability in the passing ratio, i.e. the conventional 40% passing ratio that has been referred to elsewhere and observed over time. Hence, if the probability of passing examinations has not changed much over time, then, all other things being equal, the expected number of sittings to pass the examinations (Travel Time) will also remain about the same.

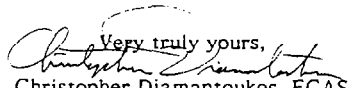
This further lead me to consider how Travel Time might be measured under a partitioned system and compared to today's Travel Time. I considered the simple example where an examination part is partitioned into two examination units. If each exam unit sitting is equivalent to one-half of an examination part sitting (a fairly reasonable assumption to allow the comparison of Travel Time) and passing ratios by exam unit are independent of each other and remain unchanged from that of the examination part, then Travel Time will remain unchanged. One can calculate the expected number of sittings based on units or parts several ways and always come up with "no change".

This realization was a bit unnerving. I realized that there must be cases that undergo increases in Travel Time while others show decreases. For example, some candidates that pass the examination part in one sitting will require at least 1 1/2 sittings when two units are substituted. Some candidates that fail to pass the examination part the first time will however pass one of the exam units and some of these candidates will continue on to pass the complementary exam unit where they would not pass the examination part today.

There is one important facet of this analysis that cannot be overlooked that may make the before and after comparisons less valid. The "no change" conclusion holds true if we are indeed speaking of the same population of candidates. For example, the comparison is not technically correct if some candidates never finally pass the examination part but proceed to pass the two equivalent examination units after partitioning.

Furthermore, those candidates that do pass the two units rather than the single part will have exhibited a passing grade in each unit: it is no longer possible to "average out" subject areas of an examination part and pass it in the aggregate. This forces a greater knowledge of the syllabus for successful candidates.

There are further situations that can be considered but the bottom line is that theoretical projections must be tempered by the importance attached to the various groups of CAS candidates. There will be both positive and negative dislocations and it will be up to the PETF to decide which results are more important than others in reaching its final recommendations. The Consideration that addresses today's successful candidates is an example of a more important area to reflect upon.

Very truly yours,

Christopher Diamantoukos, FCAS

CD/dc

cc: Partitioned Examination Task Force

Appendix 1

	<u>All Exams</u>	<u>Parts 1-3</u>	<u>Part 4</u>	<u>Excluding Parts 1-3</u>	<u>Excluding Parts 1-4</u>	<u>Travel Time Including Part 4</u>
84 Fellows						
Passed	402	54	34	348	314	
Failed	254					
Sittings	656	69	55	587	532	
Candidates	53					
Avg. Travel	12.38		1.62	11.08	10.04	11.66
85 Fellows						
Passed	340	37	22	303	281	
Failed	217					
Sittings	557	43	34	514	480	
Candidates	47					
Avg. Travel	11.85		1.55	10.94	10.21	11.76
86 Fellows						
Passed	421	53	32	368	336	
Failed	287					
Sittings	708	61	54	647	593	
Candidates	57					
Avg. Travel	12.42		1.69	11.35	10.40	12.09
87 Fellows						
Passed	410	39	37	371	334	
Failed	298					
Sittings	708	39	53	669	616	
Candidates	57					
Avg. Travel	12.42		1.43	11.74	10.81	12.24
88 Fellows						
Passed	378	19	39	359	320	
Failed	267					
Sittings	645	20	56	625	569	
Candidates	54					
Avg. Travel	11.94		1.44	11.57	10.54	11.98

Appendix 1

	A	B	A1	B1		
6	33	16	46	3	49	49
6	27	24	40	11	51	51
7	27	19	34	12	46	46
7	31	19	41	9	50	50
7	28	16	36	8	44	44
8	28	16	36	8	44	44
8	15	37	27	25	52	52
8	8	20	15	13	28	28
9	10	8	11	7	18	18
9	22	28	37	13	50	50
9	11	22	15	18	33	33
10	5	8	9	4	13	13

	A	B	A1	B1	Total
6	60	40	86	14	100
7	86	54	111	29	140
8	51	73	78	46	124
9	43	58	63	38	101
10	5	8	9	4	13
Total	245	233	347	131	478

	A	B	A1	B1	Total
6	60.0%	40.0%	86.0%	14.0%	100.0%
7	61.4%	38.6%	79.3%	20.7%	100.0%
8	41.1%	58.9%	62.9%	37.1%	100.0%
9	42.6%	57.4%	62.4%	37.6%	100.0%
10	38.5%	61.5%	69.2%	30.8%	100.0%
Total	51.3%	48.7%	72.6%	27.4%	100.0%

If you have read the CAS "white paper", please answer the following. If not, skip to Question 4.

1. In the CAS "white paper", the concept of smaller exam units was set forth. Do you agree that future actuaries will be better served with respect to the considerations listed below if partitioned units replace the current exam structure?

	1	2	3	4	5
	Strongly				Strongly
	Agree				Disagree
a. Obtaining the knowledge and skills that are basic to the actuarial profession.	[]	[]	[]	[]	[]
b. Defining the educational achievements required for membership in the CAS.	[]	[]	[]	[]	[]
c. Providing a means of measuring educational achievements.	[]	[]	[]	[]	[]
d. Positioning of the actuarial profession relative to other career options.	[]	[]	[]	[]	[]

2. Please indicate whether you agree or disagree with the following points:

	1	2	3	4	5
	Strongly				Strongly
	Agree				Disagree
a. Testing practical applications is more important than testing conceptual understanding.	[]	[]	[]	[]	[]
b. Associates should be encouraged to attain their FCAS designation.	[]	[]	[]	[]	[]

2. (continued)

- c. The current exam structure would serve students better if each exam were offered once a year with sittings in February, May, August and November. [] [] [] [] []
- d. A partitioned exam structure would serve students better than the current system of May and November exams if each partition were offered once a year with sittings in February, May, August and November. [] [] [] [] []
- e. If the exams are partitioned, it is desirable to have the option of taking full parts or partitioned subsets. [] [] [] [] []

3. Please indicate whether you agree or disagree with the following points:

- | | 1 | 2 | 3 | 4 | 5 |
|---|----------|-----|-----|-----|----------|
| | Strongly | | | | Strongly |
| | Agree | | | | Disagree |
| a. The CAS should maintain the current structure of exam administration. | [] | [] | [] | [] | [] |
| b. The CAS should partition all of parts 5-10. | [] | [] | [] | [] | [] |
| c. If partitioning is done, at least some of the current exams should be left intact. | [] | [] | [] | [] | [] |
| d. Students <u>would</u> achieve fellowship more quickly if exams were partitioned. | [] | [] | [] | [] | [] |
| e. Students <u>could</u> achieve fellowship more quickly if exams were partitioned. | [] | [] | [] | [] | [] |

4. If you have taken the partitioned Part 3 (Course 120, Course 130 or Course 135), please indicate whether you agree or disagree with the following statements:

	1	2	3	4	5
	Strongly Agree				Strongly Disagree
a. Partitioning of Part 3 helped me to complete it more quickly.	[]	[]	[]	[]	[]
b. Partitioning of Part 3 helped me to learn the material better.	[]	[]	[]	[]	[]
c. I would have followed a more aggressive Part 3 study program if it had not been partitioned.	[]	[]	[]	[]	[]

5. Please indicate whether you agree or disagree with the following statements:

	1	2	3	4	5
	Strongly Agree				Strongly Disagree
a. Partitioning of the CAS exams would be beneficial to students.	[]	[]	[]	[]	[]
b. The existence of <u>completely</u> partitioned exams will encourage me to continue pursuing an actuarial career.	[]	[]	[]	[]	[]
c. The existence of <u>selectively</u> partitioned exams will encourage me to continue pursuing an actuarial career.	[]	[]	[]	[]	[]
d. The present exam structure encourages me to continue pursuing an actuarial career.	[]	[]	[]	[]	[]
e. Absence of an exam qualification feature would make the actuarial profession less attractive.	[]	[]	[]	[]	[]

5. (continued)

f. More students would [] [] [] [] []
 achieve Associateship
 if exams were partitioned.

g. More students would [] [] [] [] []
 achieve Fellowship if
 exams were partitioned.

6. Please indicate the number of times you have taken each exam:

<u>Partitioned Exams</u>	<u>Non Partitioned Exams</u>
_____ Course 120	_____ CAS Part 1
_____ Course 130	_____ CAS Part 2
_____ Course 135	_____ CAS Part 3
	_____ CAS Part 4
	_____ CAS Part 5
	_____ CAS Part 6
	_____ CAS Part 7
	_____ CAS Part 8
	_____ CAS Part 9
	_____ CAS Part 10

7. Which exams have you passed? (Please check all that apply)

<u>Partitioned Exams</u>	<u>Non Partitioned Exams</u>
_____ Course 120	_____ CAS Part 1
_____ Course 130	_____ CAS Part 2
_____ Course 135	_____ CAS Part 3
	_____ CAS Part 4
	_____ CAS Part 5
	_____ CAS Part 6
	_____ CAS Part 7
	_____ CAS Part 8
	_____ CAS Part 9
	_____ CAS Part 10

8. In which year did you pass your first exam? 19 _____

9. If ACAS, year of associateship? 19 _____

10. If FCAS, year of fellowship? 19 _____

11. Which of the following most closely describes your employment status?

[] Insurance Company
 [] Consulting Firm
 [] Regulatory Agency
 [] Bureau or Association
 [] Other (Please specify) _____

12. Please indicate your highest level of education: (Check the one which is most appropriate)
- Less Than a Bachelor's Degree (BA or BS)
 - Bachelor's Degree (BA or BS)
 - Bachelor's Degree Plus Some Graduate Work
 - Master's Degree
 - Working on an advanced degree beyond Master's
 - Other Advanced Degree (Please specify)_____
13. If you have a Bachelor's or higher college degree, please indicate the area(s) of each of your degrees: (Check all that apply)
- Mathematics
 - Statistics
 - Computer Science
 - Economics/Finance
 - Other (Please specify)_____
14. If you would like to provide us with any other comments about partitioning of CAS exams, please do so in the space provided below or include a separate letter with your response.

THANK YOU FOR HELPING US WITH THIS SURVEY

PLEASE MAIL THE COMPLETED QUESTIONNAIRE TO THE

CAS PARTITIONED EXAM TASK-FORCE
 C/O CASUALTY ACTUARIAL SOCIETY
 ONE PENN PLAZA
 250 WEST 34TH STREET
 NEW YORK, NEW YORK 10119

CAS
Partitioned Exam Survey
Results
December 1989

OUTLINE

- Response Rate
- Distribution of Respondents
- Travel Time
- Responses to Survey Questions
- Comments
- Summary

2

RESPONSE RATE

- 16.6% Overall Response Rate.
- Response Rate by Designation Group:

<u>Group</u>	<u>Surveys Mailed</u>	<u>Number Of Responses</u>	<u>Response Rate</u>
Fellows	923	164	17.8%
Associates	619	132	21.3
CAS Students	2700	267	9.9
Other Students	0	141	-
Total	4242	704	16.6%

- 20% of the surveys were sent in by people who were not mailed a survey.
- 50% of the Fellows responding received their fellowship between 1985 and 1989. (81)

3

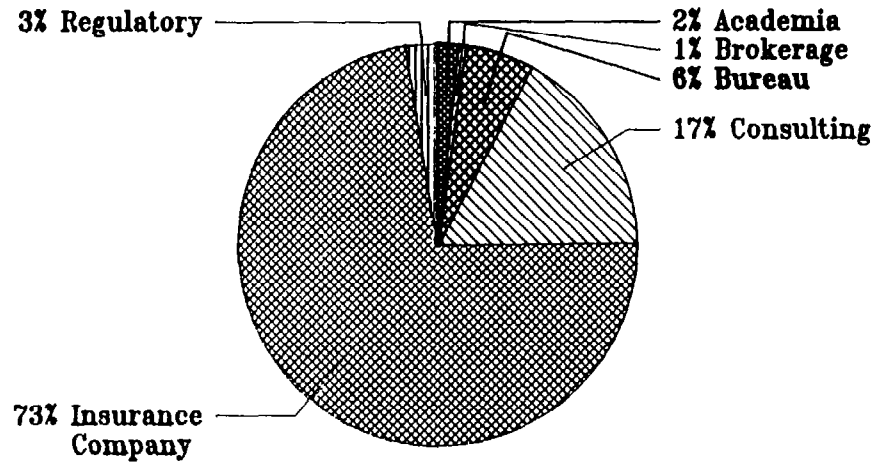
DISTRIBUTION OF RESPONDENTS

- **By Type of Employment, All Respondents Combined.**
- **By Type of Employment, FCAS/ACAS population compared to Credentialed Respondents.**
- **By Designation Level.**
- **By Partitioned vs. Nonpartitioned Part 3, Students Only.**
- **By Number of Exams Passed.**
- **Typical Respondent.**
- **Group 'A'* vs Group 'B'**

*** A Group 'A' respondent is someone who took no more than 2 attempts to pass any exam.**

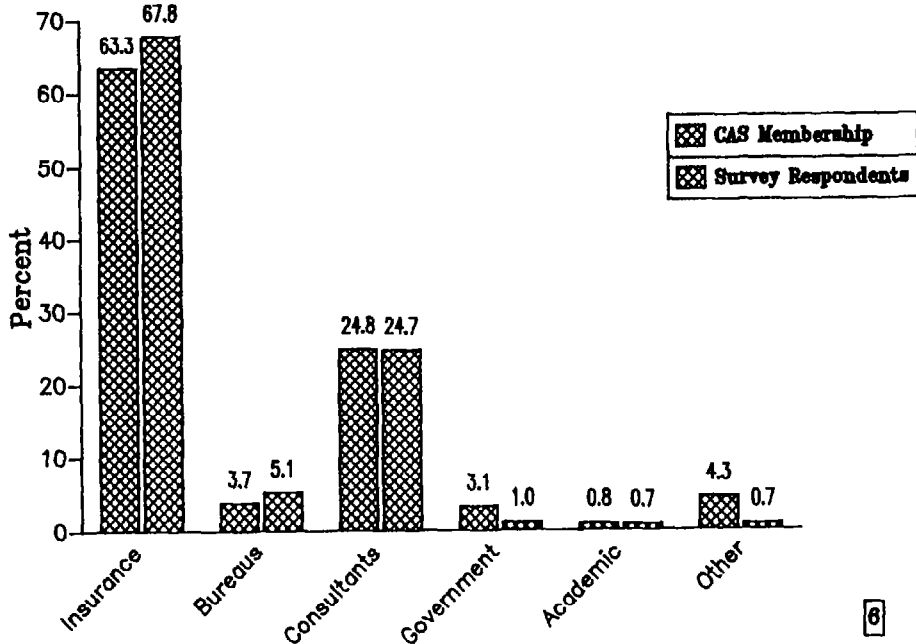
4

Distribution By Type Of Employment All Respondents Combined



306

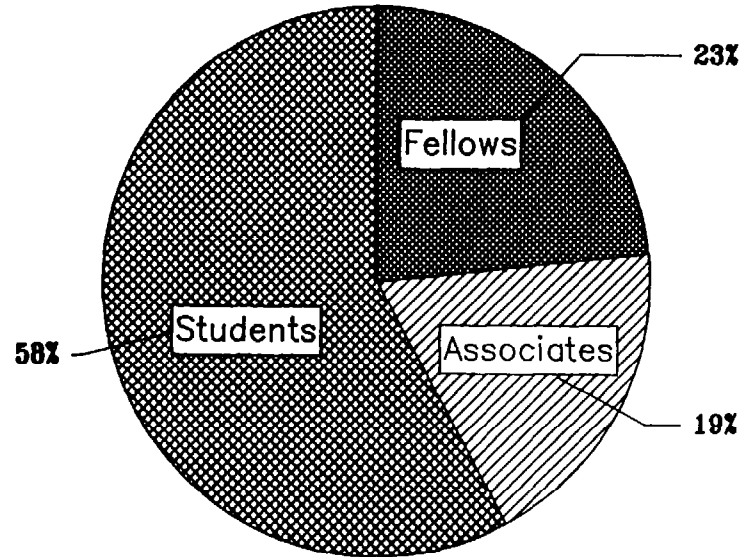
Distribution By Type of Employment Fellows and Associates Excluding Retired Actuaries



307

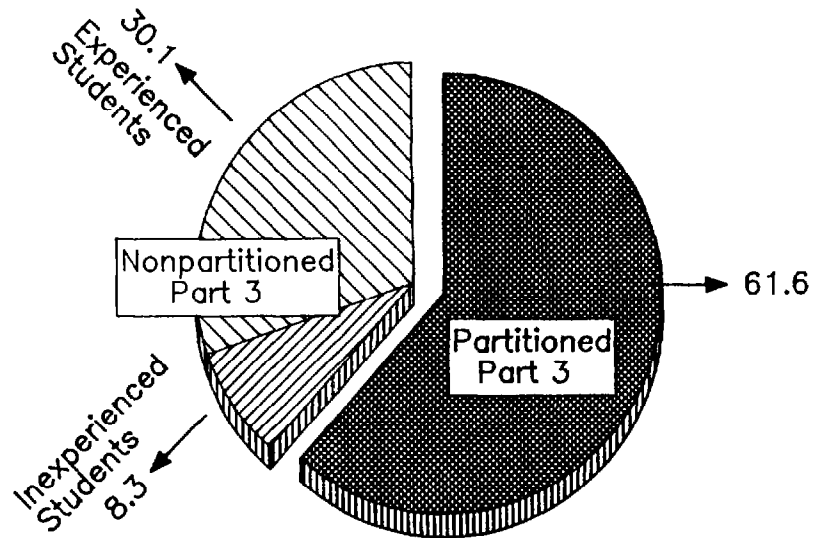
6

Distribution By Designation Level



308

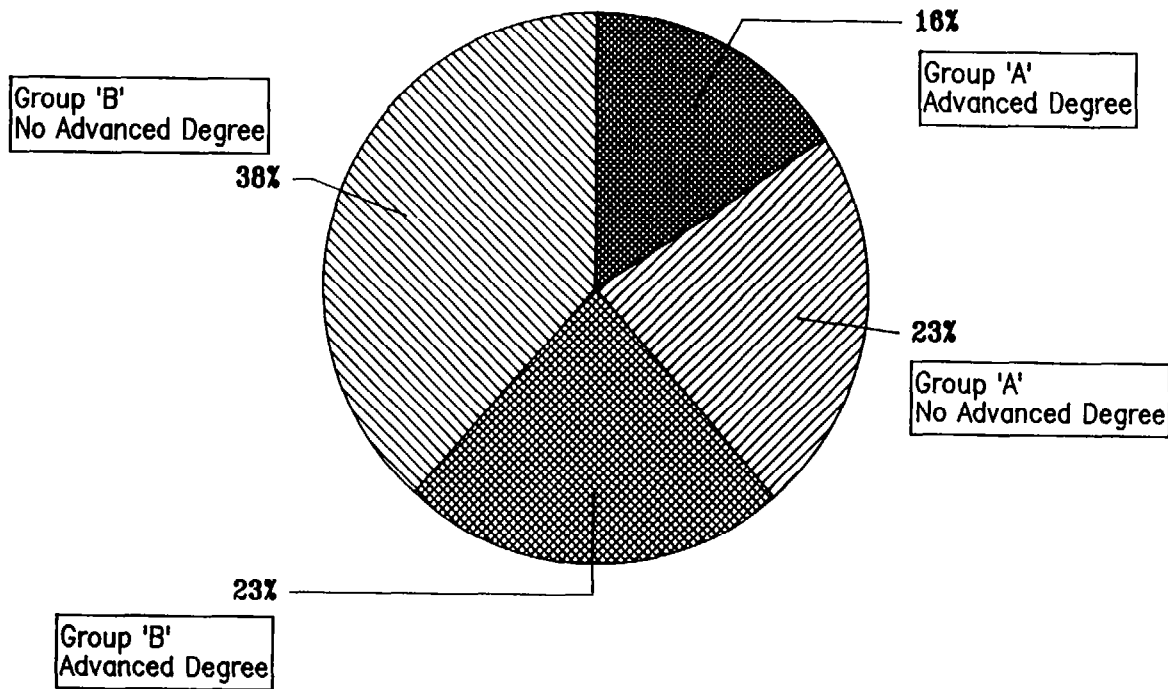
Distribution Of Students



Note: Only six Associates and no Fellows have taken part 3 as a partitioned exam.

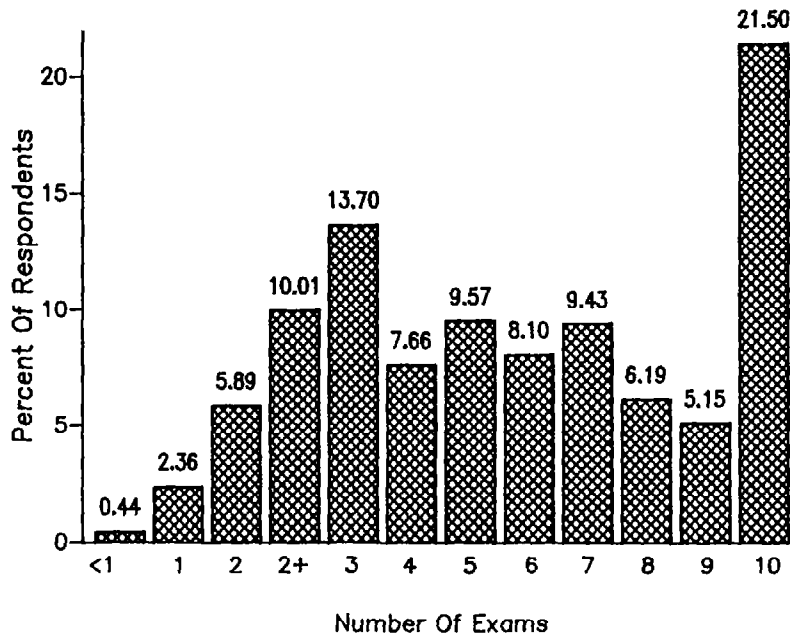
Distribution Of Credentialed Actuaries By Education Levels and Travel Rate

310



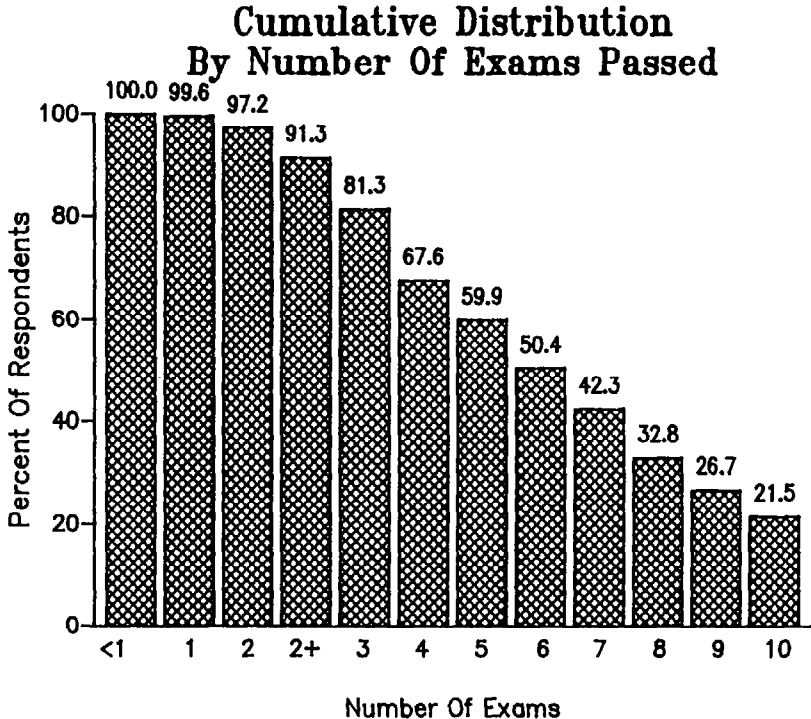
8a

Absolute Distribution By Number Of Exams Passed



9

312

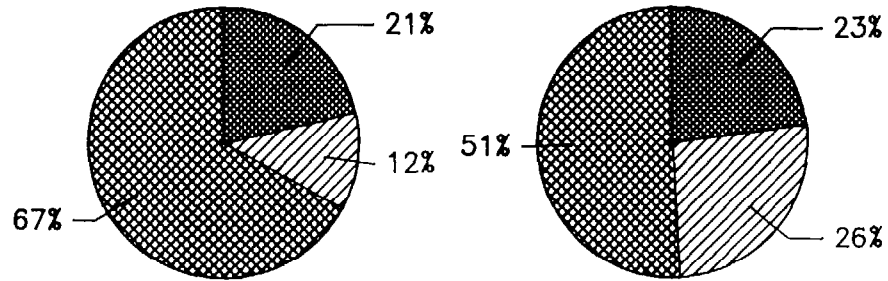


9a

Profile Of The "Typical" Respondent

- 84.0% Have Math or Actuarial Degrees
- 67.4% Do Not Have Advanced Degrees
- 73.0% Work for an Insurance Company
- 5.6 Average Exams Passed

Distribution Of Group 'A' And Group 'B' By Designation Level

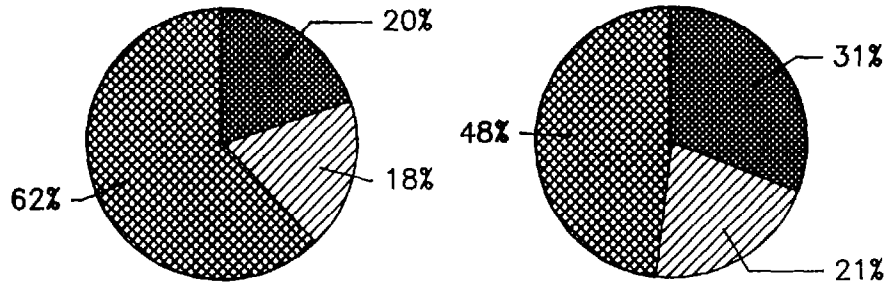


Group 'A'

Group 'B'

314

Distribution Of Academic Degrees By Designation Level



No Advanced Degree

Advanced Degree

11a

315

Percent of Group 'A' and Group 'B'

	Group 'A'	Group 'B'
Fellows (81-85)	50.0	50.0
Fellows (86-89)	40.6	59.4
Associates (86-89)*	29.0	71.0

* Associates of 86-89 are the Fellows of 90-95

Note: Numbers in Parentheses are Years of Designation

TRAVEL TIME

- * **Average Number of Attempts to Pass Exams.**

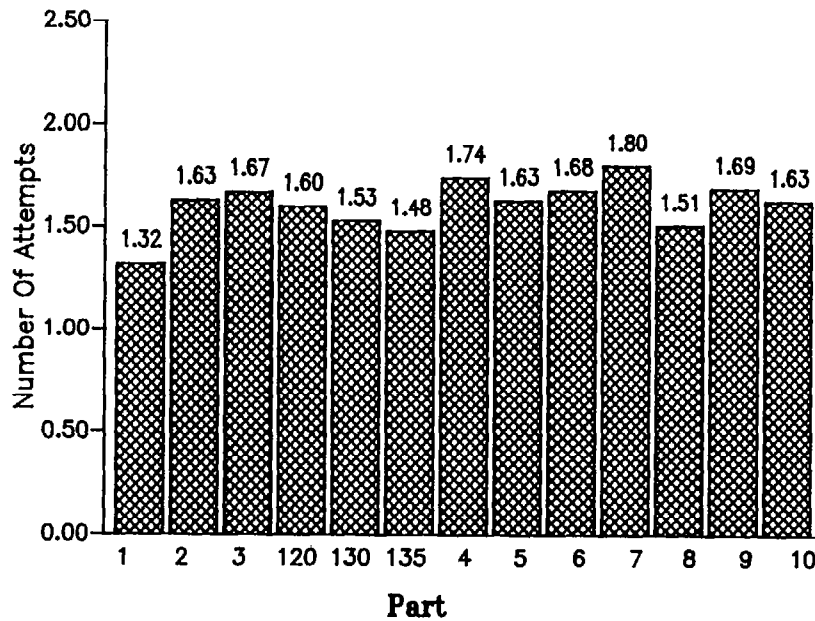
**All Respondents Combined
Group 'A' vs Group 'B'**

- * **Percent Passing Exams on First Attempt.**
- * **Trend in Travel Time to Achieve Designation.**

317

13

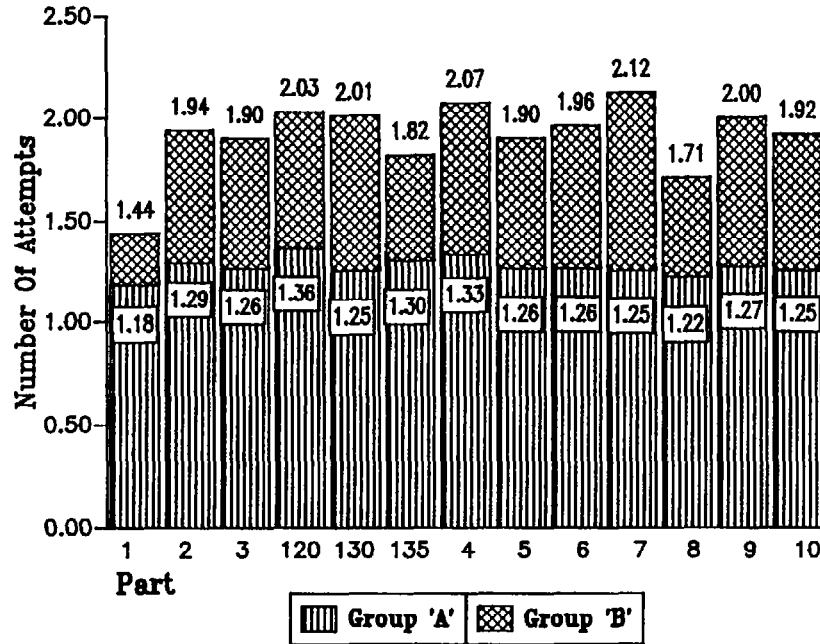
Average Number of Attempts to Pass Each Exam All Respondents Combined



818

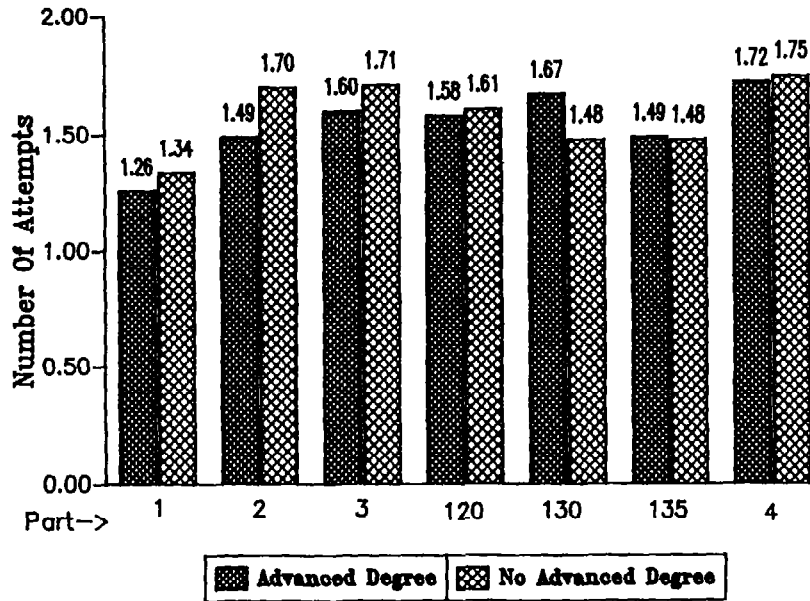
319

Average Number Of Attempts To Pass Exams
Group 'A' vs Group 'B'



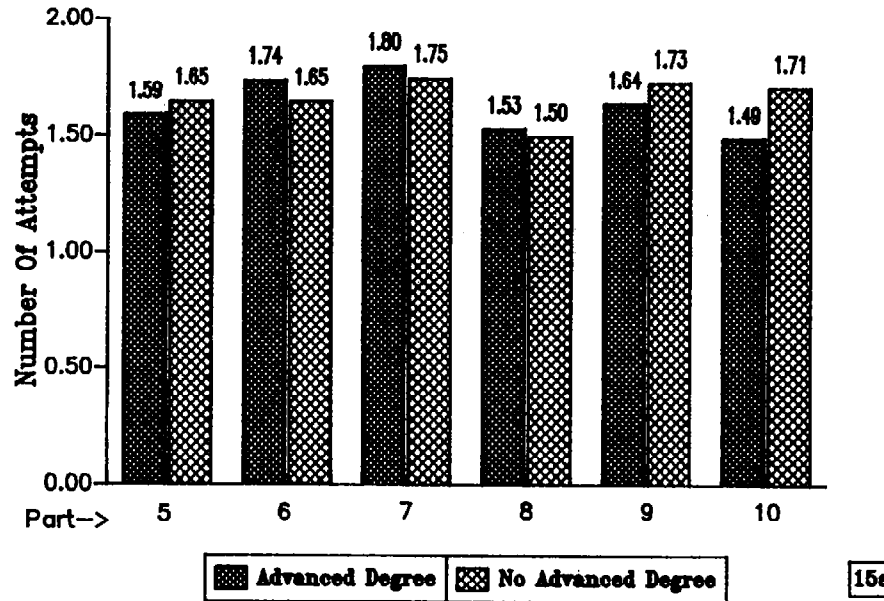
15

**Average Number Of Attempts To Pass Exams
Advanced Degrees vs No Advanced Degrees
- Early Exams -**



320

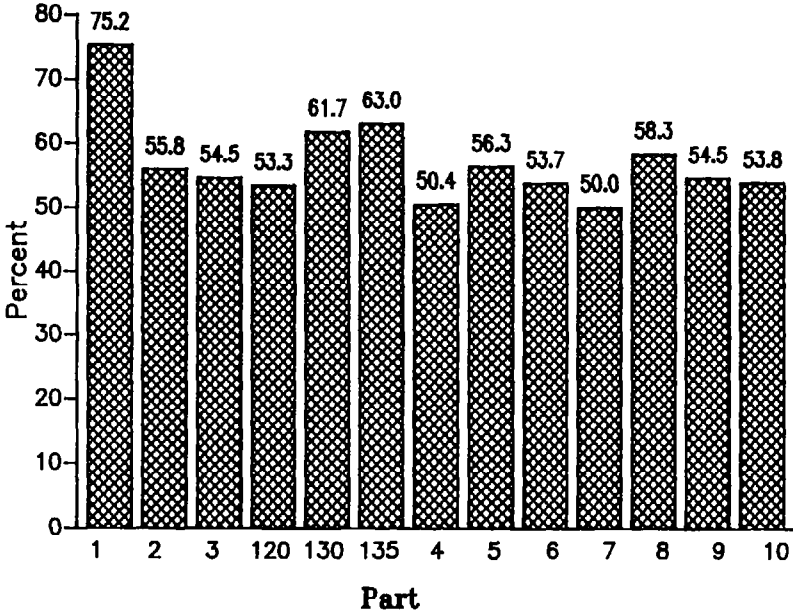
**Average Number Of Attempts To Pass Exams
Advanced Degrees vs No Advanced Degrees
- Later Exams -**



321

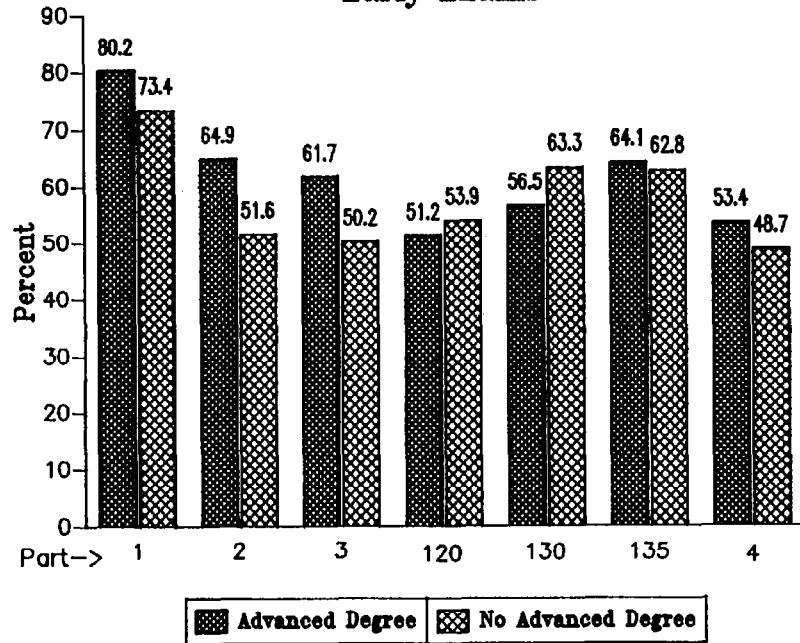
15a

Percent Passing Exams On First Attempt



322

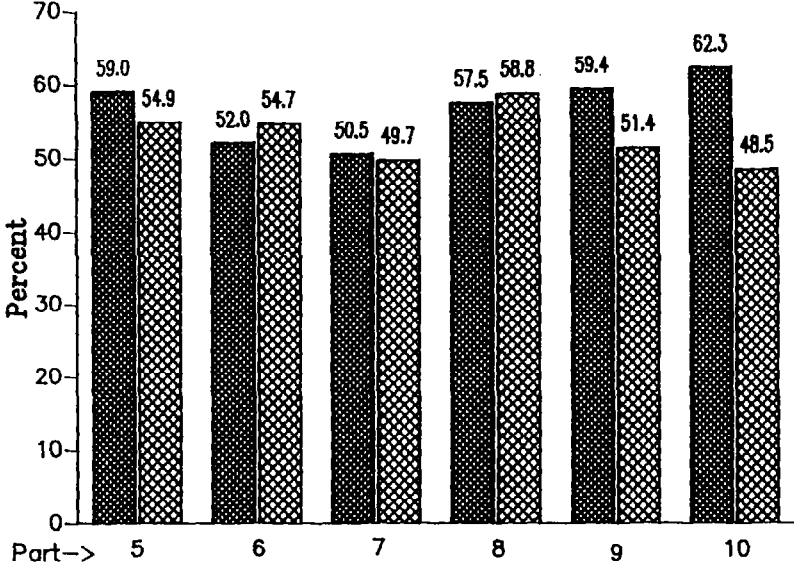
**Percent Passing Exams On First Attempt
Advanced Degrees vs No Advanced Degrees
- Early Exams -**



323

16a

Percent Passing Exams On First Attempt Advanced Degrees vs No Advanced Degrees - Later Exams -

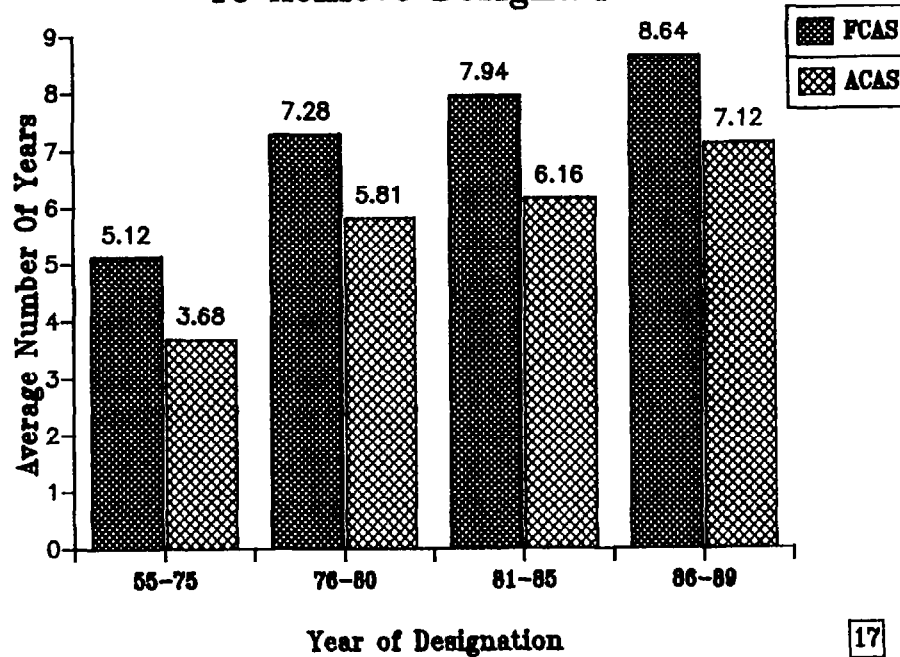


Advanced Degree No Advanced Degree

16a

324

Trend In Travel Time To Achieve Designation



325

SUMMARY OF RESPONSES ALL RESPONDENTS COMBINED

- Respondents support maintaining current structure, and are against partitioning Parts 5 - 10.
- Generally, respondents are consistent in their responses regardless of designation level and experience with partitioning Part 3.
- Partitioning will make the Actuarial Profession less attractive relative to Other Career Fields.
- Travel Time will be increased if exams are partitioned - supported by experience with partitioned Part 3.
- Partitioning will discourage students from pursuing the Actuarial Profession.
- Students should be encouraged to achieve FCAS, but fewer would if exams are partitioned.

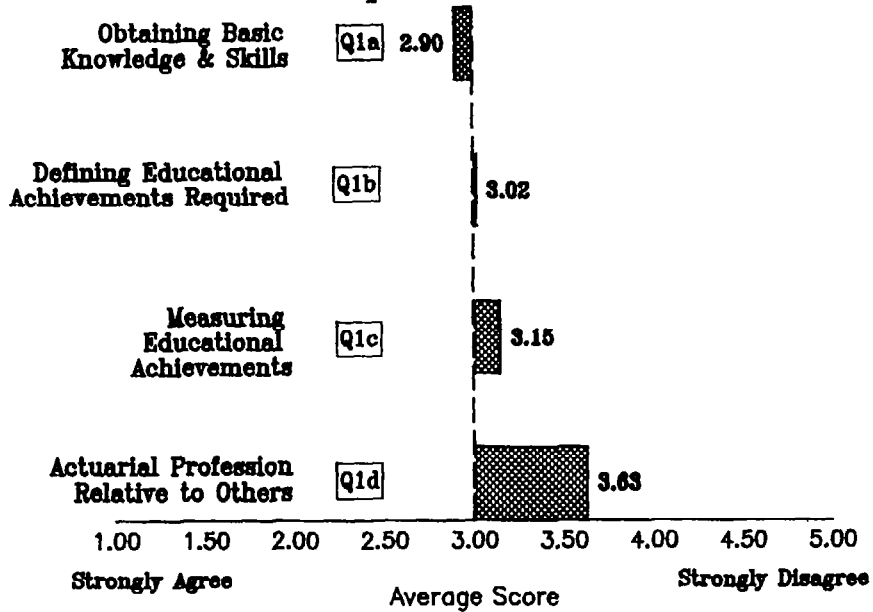
RESPONSES TO SURVEY QUESTIONS

- All Respondents Combined.
- Key Questions by Designation Level.
- Key Questions by Group 'A'
and Group 'B'.

327

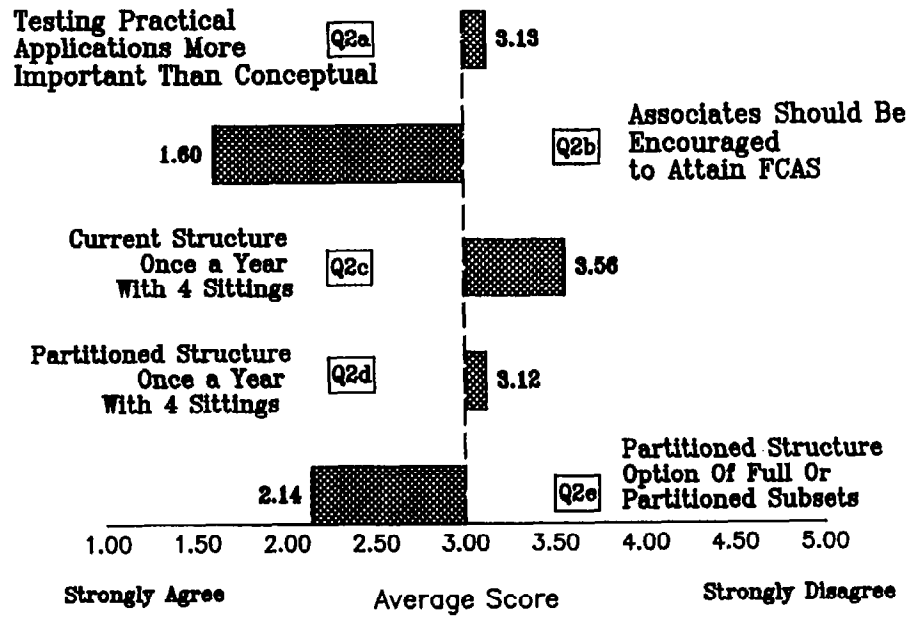
19

Question No.1 Better Served By Partitioning All Respondents Combined



328

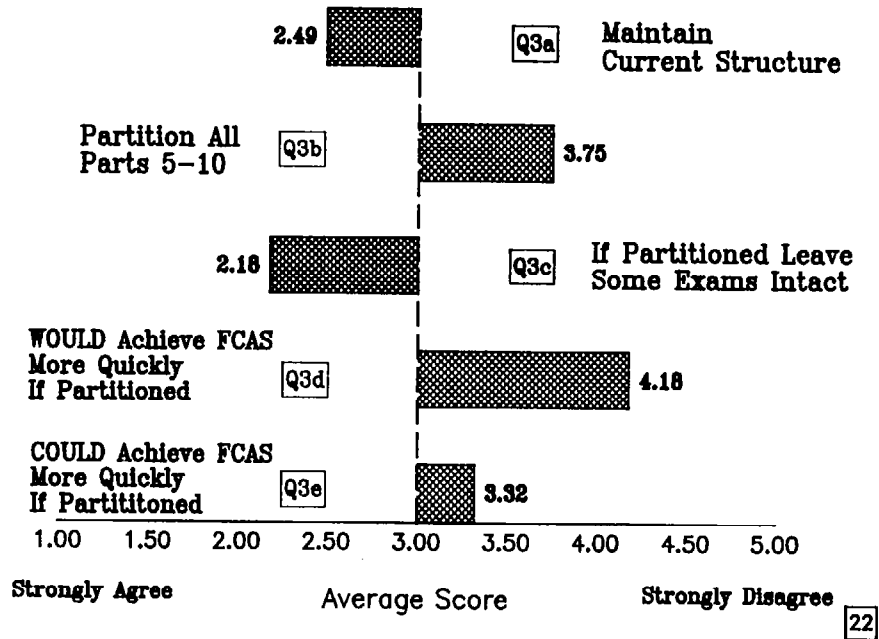
Question No. 2 All Respondents Combined



329

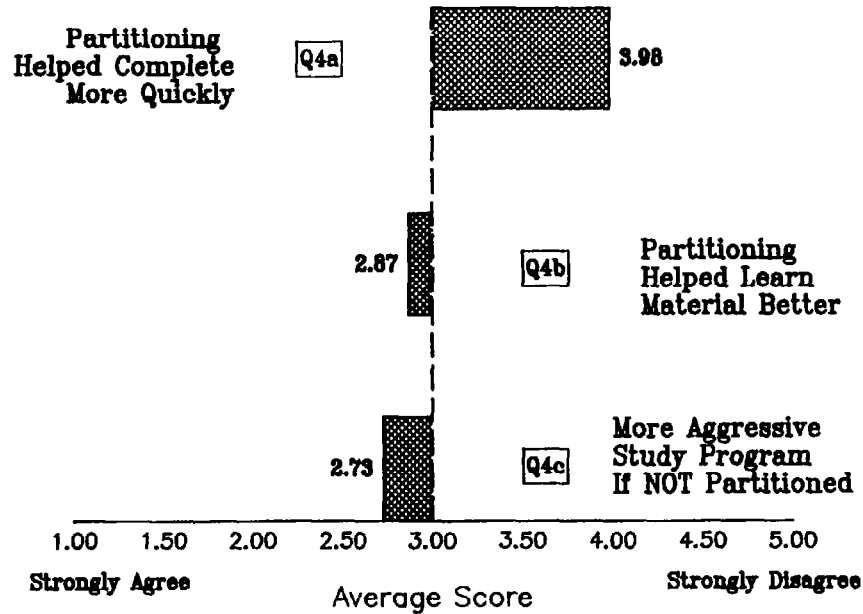
21

Question No. 3 All Respondents Combined



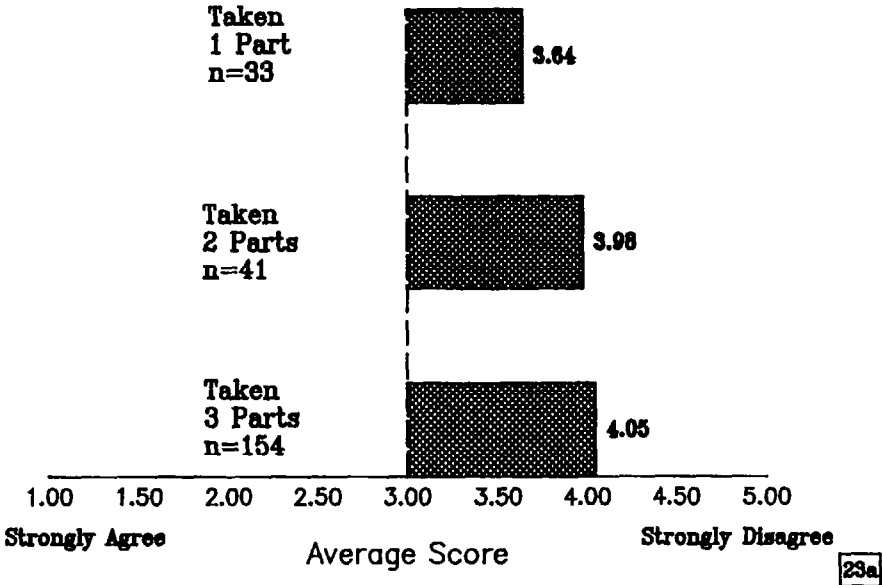
330

Question No. 4 Partitioned Part 3 Students



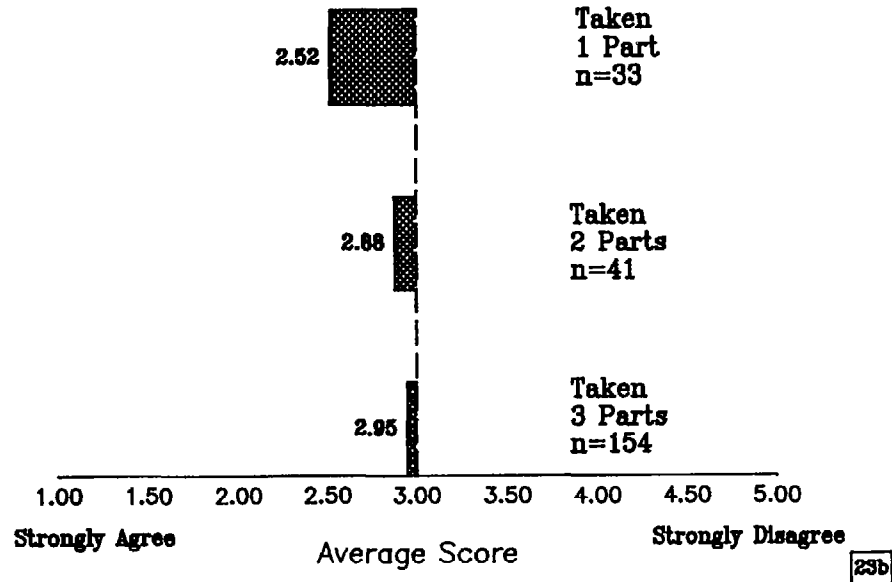
331

Question No. 4A
Partitioned Part 3 Students
Partitioned Helped Complete More Quickly



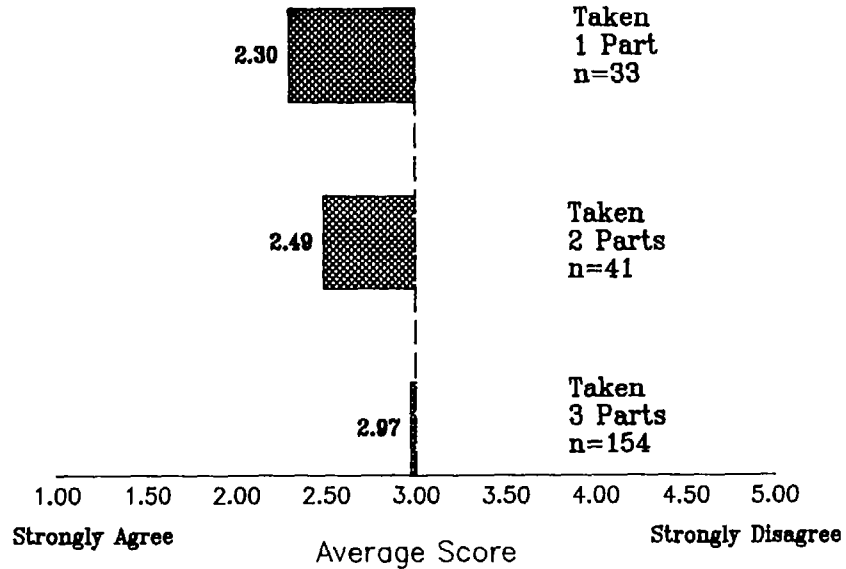
332

Question No. 4B Partitioned Part 3 Students Partitioned Helped Learn Material Better



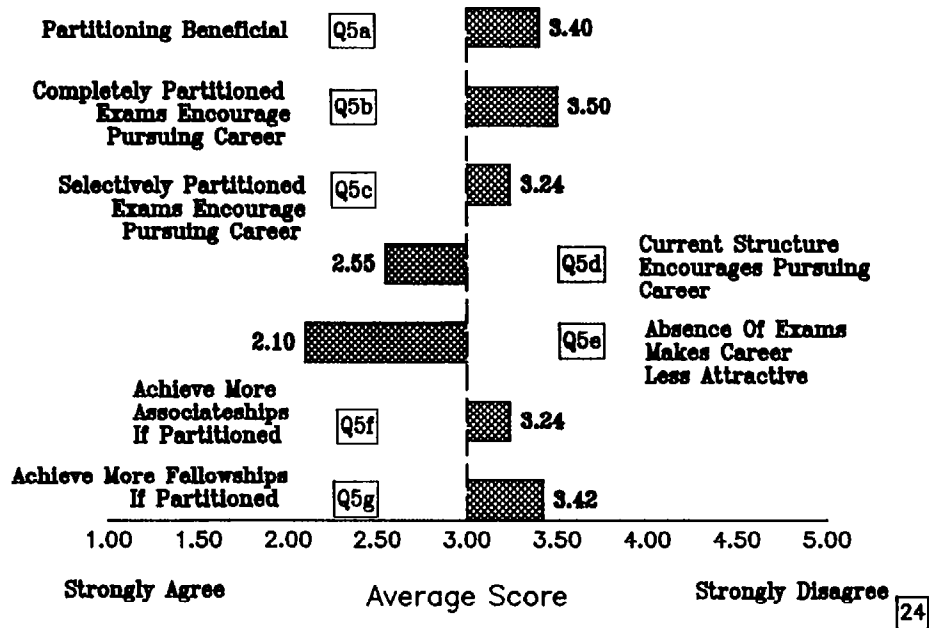
333

Question No. 4C
Partitioned Part 3 Students
More Aggressive Study Program If Not Partitioned



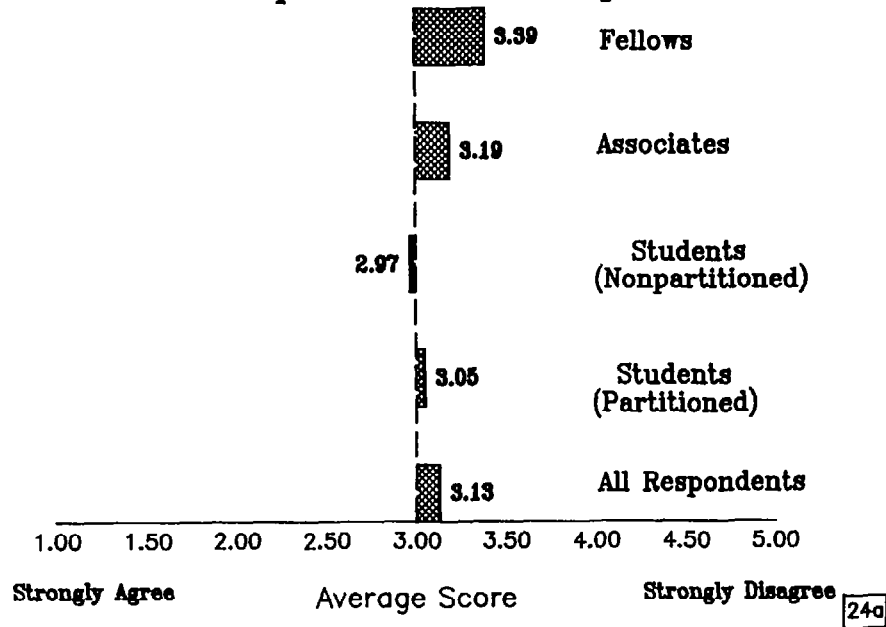
334

Question No. 5 All Respondents Combined



335

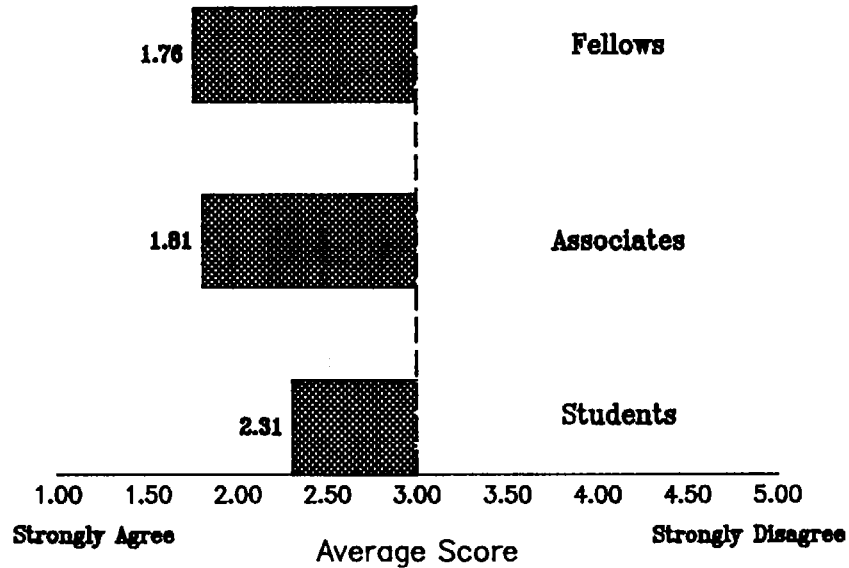
**Question No. 2a
Testing Practical Applications
More Important Than Conceptual**



336

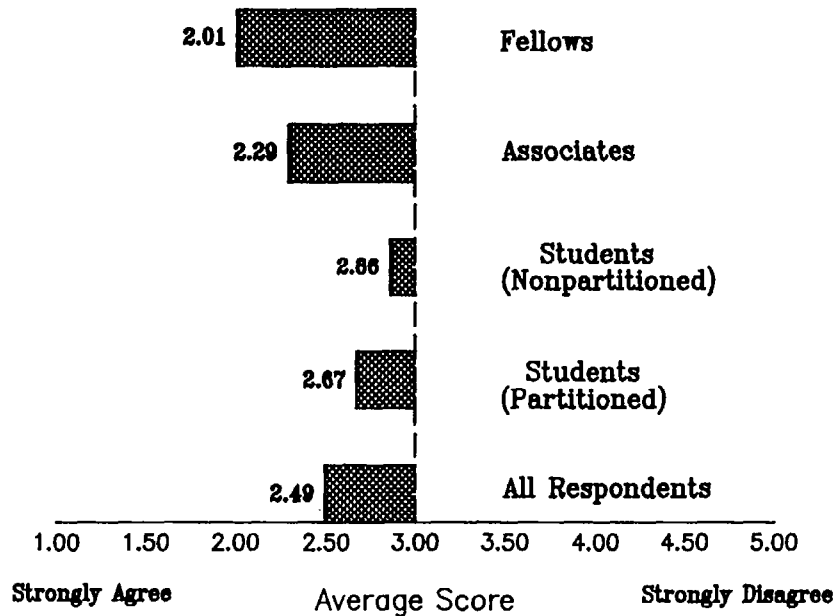
24a

Question No. 5e Absence of Exams Makes Career Less Attractive



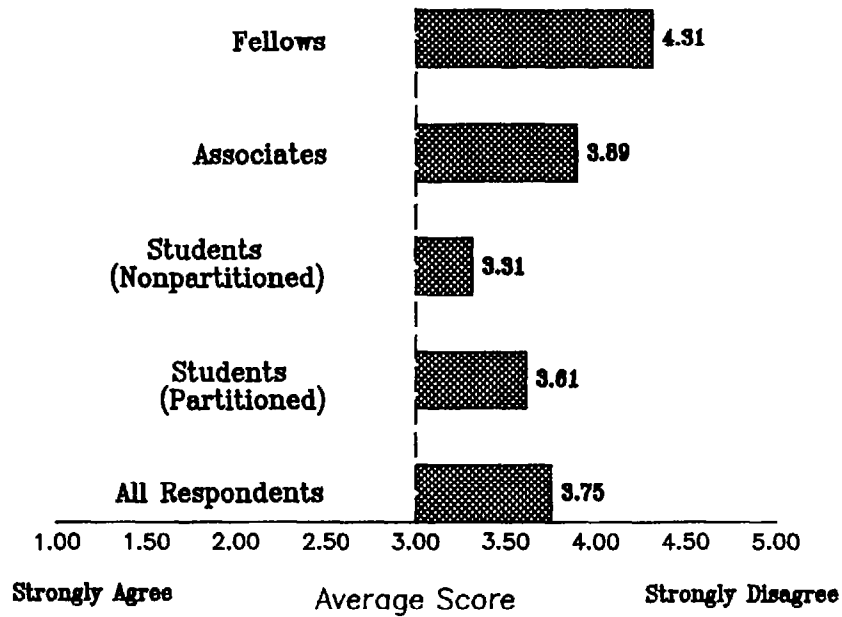
337

Question No. 3a Maintain Current Exam Structure



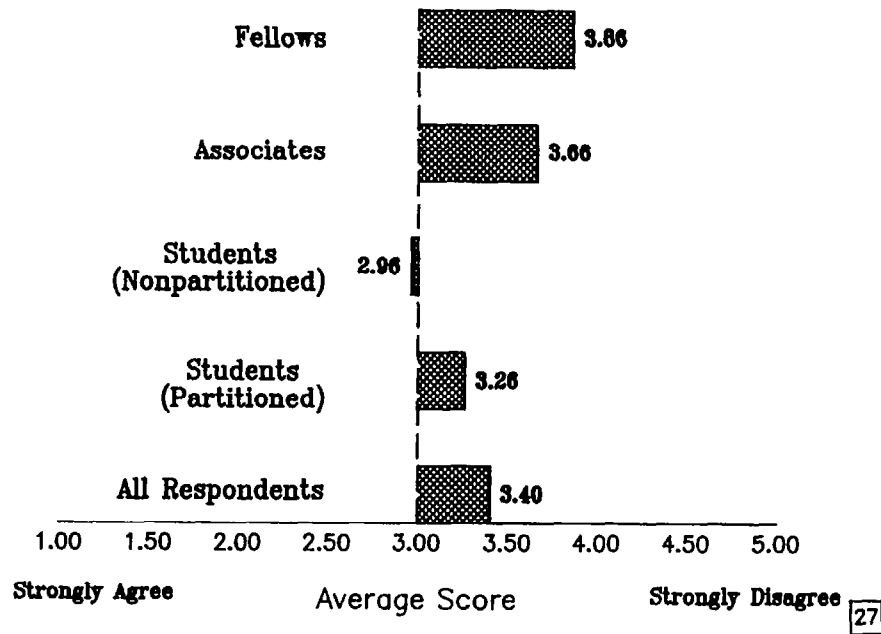
338

Question No. 3b Partition All Of Parts 5-10



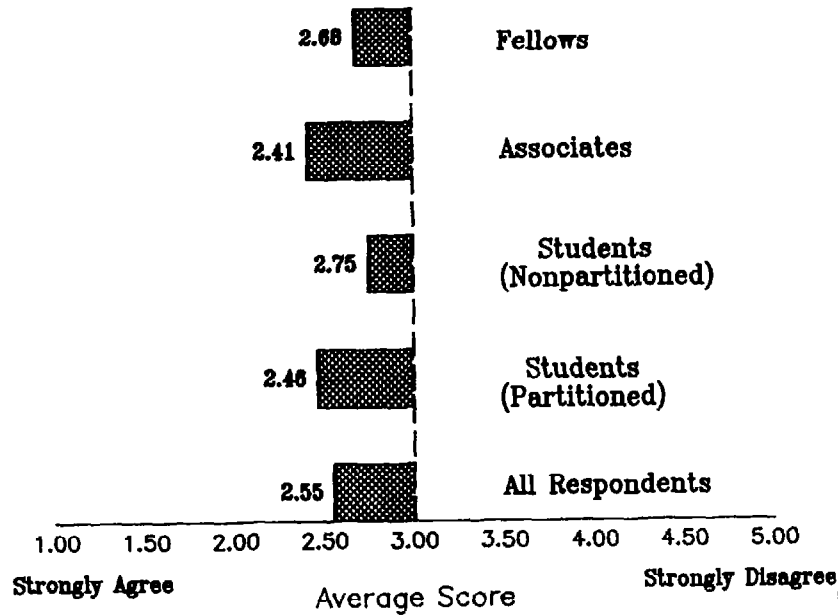
339

Question No. 5a Partitioning of Exams Beneficial To Students



340

Question No. 5d Present Exam Structure Encourages Pursuing Career



27b

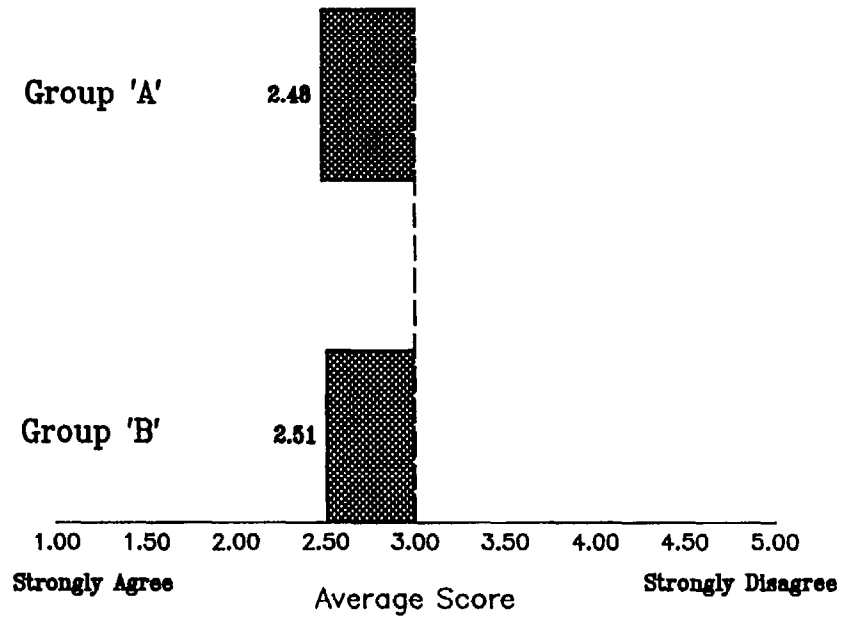
341

SUMMARY OF RESPONSES Group 'A' vs Group 'B'

Group 'A' and Group 'B' concur on their opinions regarding the exam structure.

- The CAS should maintain current structure.
- The CAS should not partition all of Parts 5 - 10.

Question No. 3a Maintain Current Structure



343

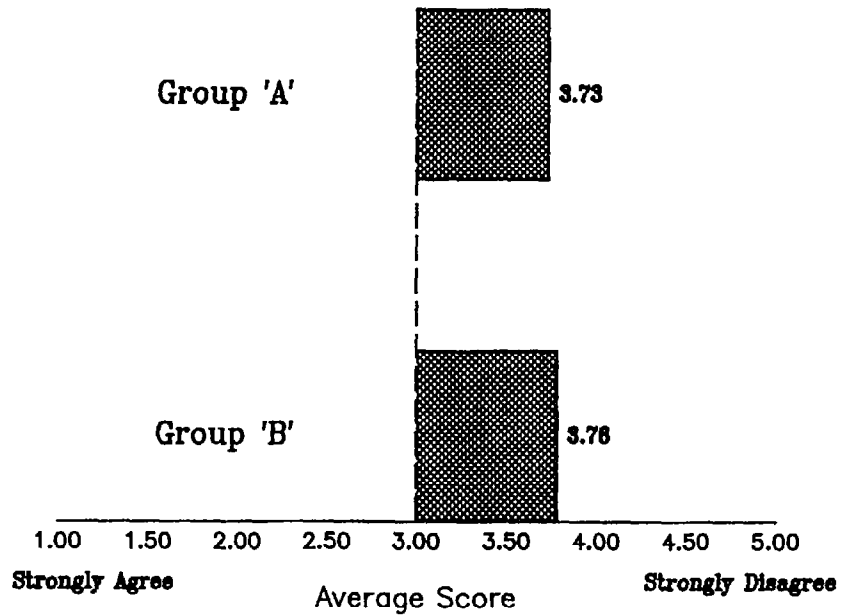
**Question No. 3a
Maintain Current Structure**

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Grp A Nbr	101	74	47	55	30
Prot	32.9 %	24.1%	15.3%	17.9%	9.8 %
Grp B Nbr	103	76	61	61	28
Prot	31.3 %	23.1%	18.5%	18.5%	8.5 %

344

20a

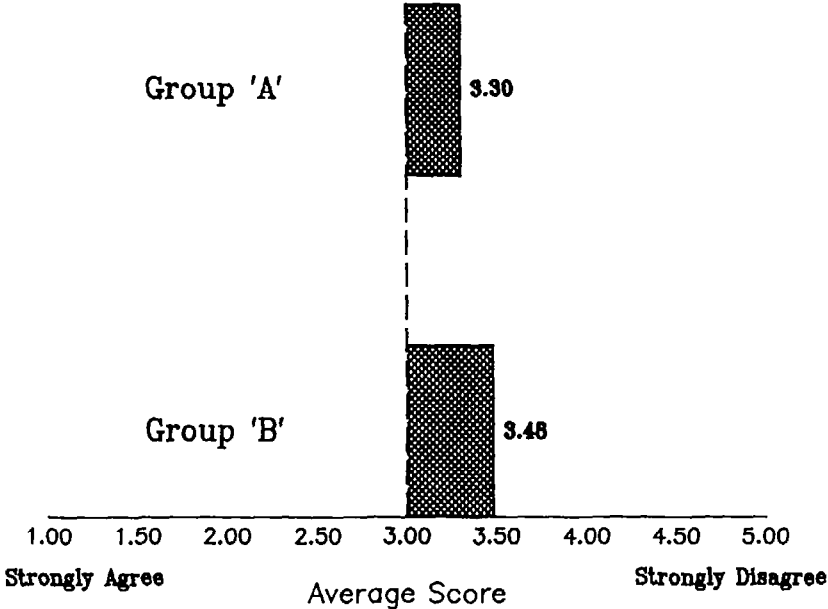
Question No. 3b Partition All Parts 5-10



345

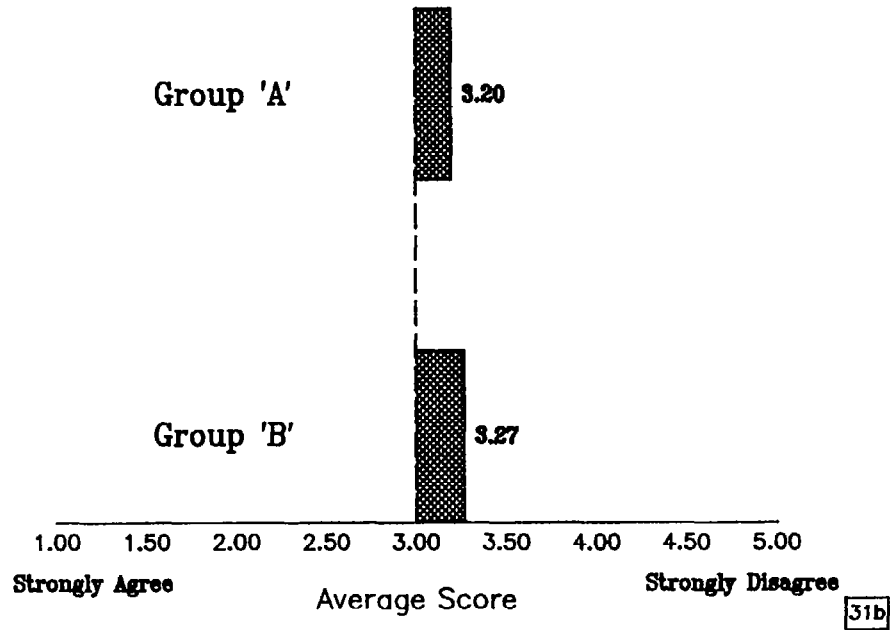
30

Question No. 5a
Partition Of Exams Beneficial



346

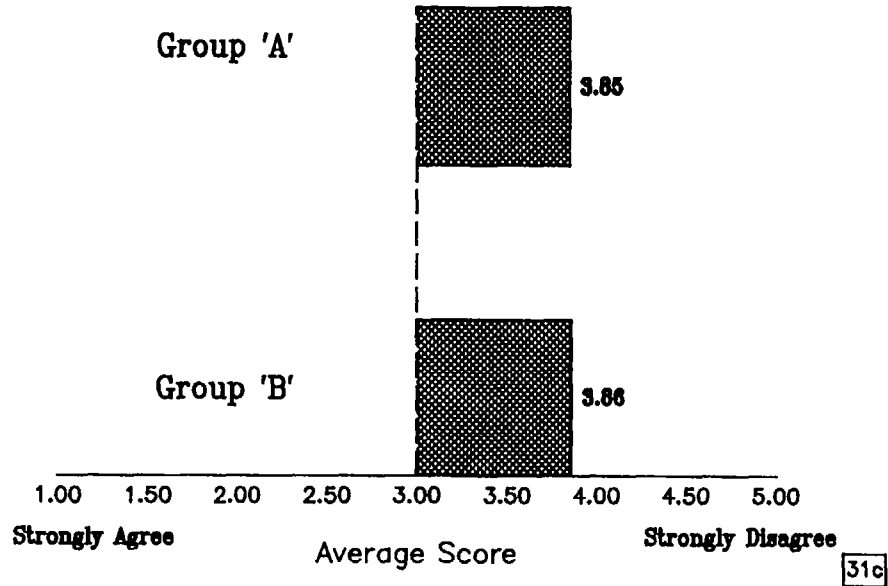
Question No. 5c Selective Partitioning Would Encourage Me



347

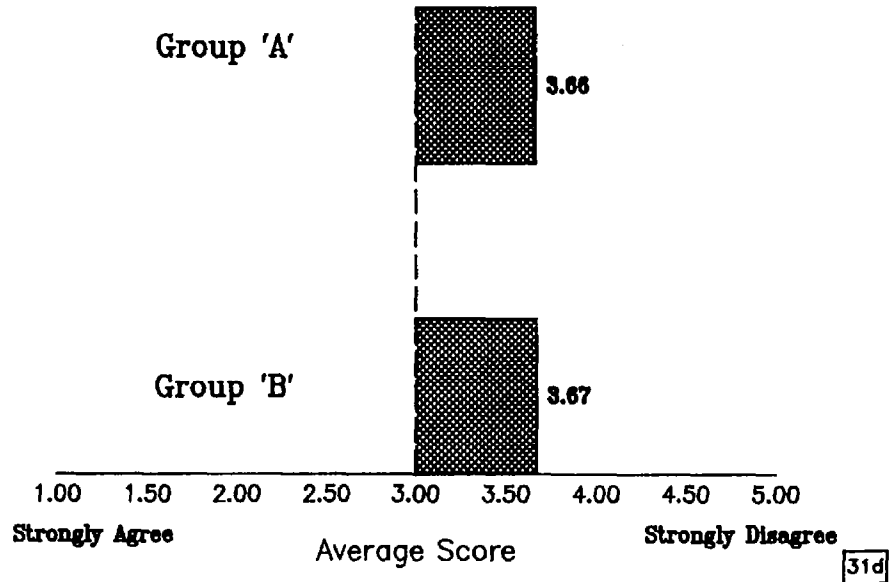
31b

**Fellows
Question No. 5a
Partition Of Exams Beneficial**



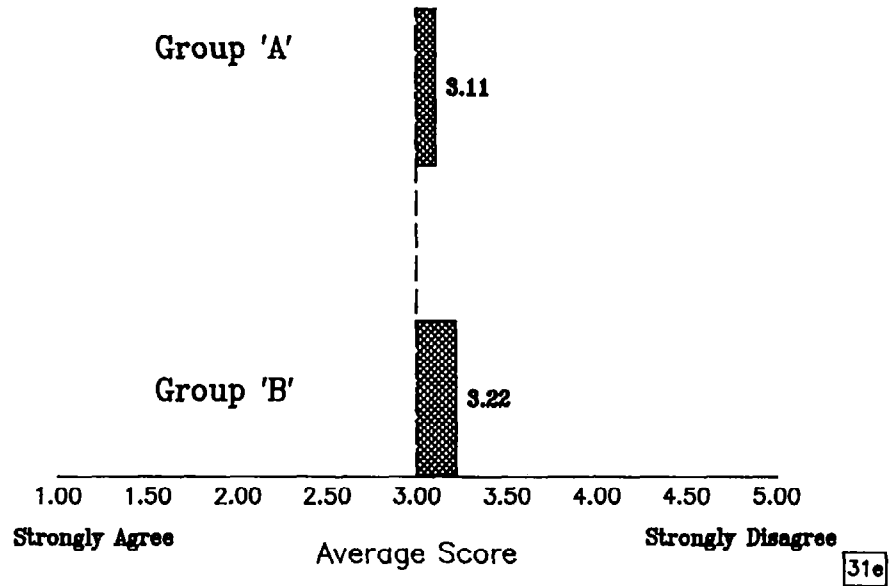
348

**Associates
Question No. 5a
Partition Of Exams Beneficial**



349

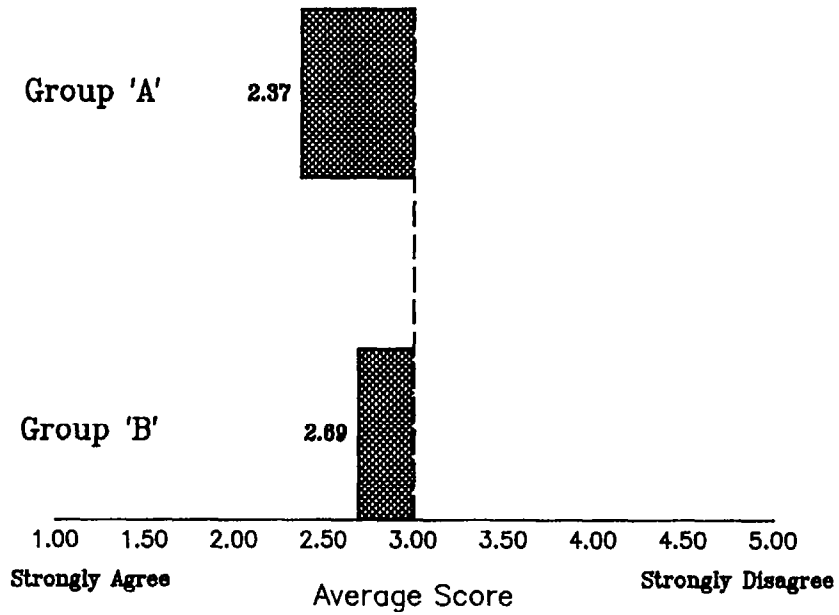
**Students
Question No. 5a
Partition Of Exams Beneficial**



350

31e

Question No. 5d
Present Exam Structure Encourages Me



351

COMMENTS

- 354 out of 704 respondents wrote comments.
Comments represent the viewpoints of approximately half the respondents.
- Comment results are consistent across designation level and experience with partitioned Part 3.

352

TOP TEN COMMENTS

1. Partitioning will increase travel time. (88)
2. Quality of education and Actuaries will not be enhanced or will be reduced. (52)
3. Offer each exam biannually. (52)
4. Students will be discouraged from entering profession or discouraged from taking exams or leave the profession altogether. (50)
5. Because of negative experience with partitioned Part 3, I am against partitioning. (47)
6. Students who opt to sit for a whole exam will be handicapped against those who will just sit for one part of an exam. (44)
7. Partitioning makes it more difficult to stress synthesis and integration of knowledge. (31)
8. Keep the exams as they are, but improve the content and design. (25)
9. I strongly disagree with partitioning. (20)
10. Exams should be offered 3 to 4 times per year. (20)

Note: The figures in parenthesis indicate the number of times the comment appeared in the survey.

SUMMARY

- **16.6% Response Rate.**
- **Even without Partitioning, Travel Time is Increasing.**
- **Respondents are "Pro" Maintaining Current Structure.**
- **Respondents are Against Partitioning Parts 5 - 10.**
- **Respondents support current structure regardless of designation level.**

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35

CAS SYLLABUS MILESTONES

1960 - 1990

CAS Syllabus MilestonesAncient History

- . Prior to 1960 the CAS maintained a completely separate eight exam syllabus. Exams were given annually in May.
- . There was no General Mathematics exam. Part 1 covered Probability and Statistics as separate topics. Part 2a covered Life Insurance Mathematics; 2b covered Principles of Insurance, Economics and Investments. Parts 1 and 2 were partitioned into four separate sub parts.
- . Other exam topic arrangements were quite similar to exams given through the 10 exam syllabus of 1975, but there was no partitioning beyond Part 2.
- . The last two examinations could be waived by "presenting an original thesis on an approved subject relating to insurance". This was known as the "paper route". The paper route was discontinued in 1962.

Joint Administration

- . A three hour General Mathematics exam was introduced in 1960.
- . Parts 2 and 3 corresponded to ancient Parts 1 and 2. Part 2 was partitioned until 1963. Part 3 was partitioned until 1969.
- . In 1962 the CAS began joint administration of Part 1 with the SOA.
- . In 1966 joint administration of both Parts 1 and 2 began.

The Eight Exam Syllabus

- . From 1966 to 1968 the CAS administered a syllabus of eight three hour exams including jointly administered Parts 1 and 2. Exams were given annually in May.
- . Four exams were required for ACAS.
- . Parts 1 and 2 were multiple choice; the remaining exams were essay type.
- . Part 3 was "partitioned". Parts 3a and 3b could be taken and passed separately.
 - Part 3a was called Elementary Life Insurance Mathematics. This was not a very rigorous examination. The textbook was very elementary.

- Part 3b was called General Principles of Insurance, Insurance Economics and Investments.
- . Ratemaking was one half of a three hour exam. The other half was Insurance Coverages and Policy Forms.

The Nine Exam Syllabus

- . From 1969 to 1974 the CAS administered a nine exam syllabus consisting of 7 three hour exams and 2 two hour exams. Total exam hours were increased from 24 to 25. Exams were given in May and November.
- . Five exams were required for ACAS.
- . Part 3 became a separate two hour exam covering Compound Interest and Life Contingencies. This exam corresponded to Part 3a of the eight exam syllabus.
- . Part 4 covered (a) Economics and Risk Theory and (b) Insurance Coverages and Policy Forms. Part 4 corresponded to Parts 3b and 4a of the eight exam syllabus.
- . Under the new syllabus, new Parts 4a and 4b could be taken separately during a brief transition period.
- . Part 5 covered (a) Ratemaking and (b) Insurance Statistics and Data Processing. Part 5 corresponded to 4b and 8a of the eight exam syllabus.
- . New Part 6, the "law" exam, was previously Part 5 and the new Part 7, the "reserve" exam, was previously Part 6.
- . Part 8 became a separate two hour exam covering Individual Risk Rating. Previously it was Part 7a of the eight exam syllabus.
- . Part 9 covered Advanced Insurance Problems which were previously covered under Part 7b (Underwriting and Administration) and 8b (Advanced Ratemaking).
- . Summarizing, the nine exam syllabus was little more than a rearrangement of the eight exam syllabus with one half hour of testing added to the Life Contingencies and Individual Risk Rating topics.

The Ten Exam Syllabus

- . The current exam syllabus was effective beginning with the 1975 examinations. It initially consisted of ten exams, nine of which were three hours in length and one was four hours in length, for a total of 31 hours.
- . Seven exams are required for ACAS. At the time the 10 exam syllabus was adopted, there was considerable sentiment in favor of an experience requirement. The seven exam ACAS requirement was viewed as a proxy for the experience requirement.
- . The principal change was the addition of Part 3 covering Numerical Analysis and Theory of Interest, which was jointly administered with the SOA.
- . Life Contingencies was separated from Theory of Interest and became section (a) of Part 4. Section (b) was new material covering Operations Research and Data Processing. The Jordan text for life contingencies was introduced at this time.
- . Old Part 4 became Part 5, old Part 5 became Part 6, old Part 6 became Part 7, and old Part 7 became Part 8.
- . Advanced Ratemaking was combined with Individual Risk rating to form Part 9.
- . Part 10 consisted of Insurance Company Operations, Reinsurance and Current Topics.
- . During a brief transition period Parts 4a, 4b, 9a and 9b could be taken and passed separately.
- . In 1979 Parts 6 and 7 were increased to four hours.
- . Forecasting was added to Part 10 in 1978, and Part 10 was increased to four hours in 1982.
- . Summarizing, SOA Part 3 was incorporated into the CAS syllabus; new material was added on Operations Research; and testing time was expanded for other topics.

The Enrolled Actuaries Experiment

- . Part 4 was a jointly sponsored exam from 1980 to 1982. The sponsors were the CAS, the SOA and the Joint Board for Enrollment of Actuaries.
- . In order to comply with the Joint Board's enrollment requirements, the SOA was forced to restructure its syllabus and offer a more elementary exam on interest

and life contingencies. This event presented an opportunity for joint CAS sponsorship; and apparently motivated by ecumenical spirit, the CAS agreed to the arrangement.

- . As a result, Theory of Interest and Life Contingencies were combined in Part 4, which became a four hour exam. Operations Research was moved to Part 3, and combined with Numerical Analysis and Applied Statistics. Operations Research was a new topic for the SOA; Applied Statistics was a new topic for both the CAS and SOA.
- . Because of low pass ratios imposed on both the CAS and SOA by the Joint Board and because of overemphasis on life contingency and pension topics not considered useful to casualty actuaries, the CAS ended its joint sponsorship of Part 4 in 1983.
- . In 1983 Credibility Theory was added to CAS Part 4. Part 3, which is still jointly sponsored, was increased to four hours.

The Canadian Connection

- . A specific Canadian section was introduced into Part 8 in 1987, making it necessary for candidates to specify at the time of application whether they were sitting for the US or Canadian version.
- . In 1988 Part 8 was increased to four hours.
- . In 1989 the separate Canadian Part 8 was dropped in favor of increased Canadian content throughout the syllabus.

Modern Times

- . Part 3 was partitioned in 1987.
- . In 1990 Operations Research will no longer be required by the CAS. In its place a new exam (Part 3B), Introduction to Property and Casualty Insurance will be given.
- . Also in 1990 Insurance Coverages, etc. will no longer be tested in Part 5. Instead a section on Finance will be added as Part 5B. Part 5A will be Economics and Risk Theory. Part 5 will be partitioned during a transition period lasting through 1991.
- . The syllabus now requires 37 hours of testing.

1988 SYLLABUS OF EXAMINATIONS

<u>Part</u>	<u>Time Allowed</u>	<u>Subjects</u>
<i>Associateship Examinations</i>		
1*	3 hours	Calculus and Linear Algebra
2*	3 hours	Probability and Statistics
3a*	1½ hours	Applied Statistical Methods
3b*	1½ hours	Operations Research
3c*	1 hour	Numerical Methods
4	4 hours	Interest and Life Contingencies; Credibility Theory and Loss Distributions
5	3 hours	Principles of Economics; Theory of Risk and Insurance; Insurance Exposures and Coverages; Underwriting, Marketing and Claim Functions
6	4 hours	Principles of Ratemaking and Data for Ratemaking
7	4 hours	Premium, Loss, and Expense Reserves; Insurance Accounting, Expense Analysis, and Published Financial Information
<i>Fellowship Examinations</i>		
8**	4 hours	Insurance Law and Statutory Insurance; Regulation and Regulatory Issues
9	4 hours	Advanced Ratemaking; Individual Risk Rating; Excess Rating
10	4 hours	Financial Operations of Insurance Companies; Reinsurance; Forecasting; Valuation Topics

*Jointly administered with the Society of Actuaries

** Candidates must specify the United States or Canadian specialty at the time of application.

1980 SYLLABUS OF EXAMINATIONS

Associateship Examinations

<u>Part</u>	<u>Time Allowed</u>	<u>Subjects</u>
1*	3 hours	General Mathematics
2*	3 hours	Probability and Statistics
3*	3 hours	Numerical Methods and Operations Research
4**	3 hours	a) Theory of Interest b) Introduction to Life Contingencies
5	3 hours	Principles of Economics, Theory of Risk and Insurance, Policy Forms and Coverages, Underwriting and Marketing
6	4 hours	Principles of Ratemaking and Data for Ratemaking
7	4 hours	Insurance Accounting and Expense Analysis, Premium, Loss, and Expense Reserves

Fellowship Examinations

8	3 hours	Insurance Law, Supervision and Regulation, and Statutory Insurance
9	4 hours	Advanced Ratemaking and Individual Risk Rating
10	3 hours	Financial Operations of Insurance Companies, Reinsurance and Excess Rating, Forecasting, and Current Events and Issues

* Jointly administered with the Society of Actuaries

** Jointly administered with the Society of Actuaries, the American Society of Pension Actuaries and the Joint Board for the Enrollment of Actuaries.

5

SYLLABUS OF EXAMINATIONS
(Effective with 1975 Examinations)

<u>Part</u>	<u>Subject</u>
1	General Mathematics*
2	Probability and Statistics*
3	Numerical Analysis and Theory of Interest*
4	(a) Life Contingencies
	(b) Operations Research, Decision Theory, Data Processing
5	Principles of Economics, Theory of Risk and Insurance Forms, Coverages, Underwriting, Product Design, Marketing
6	Principles of Ratemaking and Insurance Statistics
7	Insurance Accounting and Expense Analysis Premium, Loss, and Expense Reserves
8	Insurance Law; Supervision and Regulation Statutory Insurances
9	(a) Advanced Ratemaking
	(b) Individual Risk Rating
10	Operations of Insurance Companies, Reinsurance, Topics of Current Interest

* Jointly administered with the Society of Actuaries

1967

4

SYLLABUS OF EXAMINATIONS

ASSOCIATESHIP

Part	Section	Subject
1		General Mathematics.
2		Probability and Statistics.
3	(a)	Elementary Life Insurance Mathematics.
	(b)	General Principles of Insurance; Insurance Economics and Investments.
4	{ (a)	Insurance Coverages and Policy Forms.
	{ (b)	General Principles of Ratemaking.

FELLOWSHIP

5	{ (a)	Insurance Law, Supervision, Regulation and Taxation.
	{ (b)	Statutory Insurances.
6	{ (a)	Premium, Loss and Expense Reserves.
	{ (b)	Insurance Accounting and Expense Analysis.
7	{ (a)	Individual Risk Rating.
	{ (b)	Problems in Underwriting and Administration.
8	{ (a)	Insurance Statistics and Machine Methods.
	{ (b)	Advanced Problems in Ratemaking.

1970

SYLLABUS OF EXAMINATIONS
(Effective with 1969 Examinations)

ASSOCIATESHIP

Part	Time Allowed	Subject
1	3 hours	General Mathematics (jointly sponsored with the Society of Actuaries)
2	3 hours	Probability and Statistics (jointly sponsored with the Society of Actuaries)
3	2 hours	Compound Interest and Life Contingencies
4	3 hours	(a) Principles of Economics: Theory of Risk and Insurance (b) Insurance Coverages and Policy Forms
5	3 hours	(a) Principles of Ratemaking (b) Insurance Statistics and Data Processing

FELLOWSHIP

6	3 hours	(a) Insurance Law; Supervision, Regulation, and Taxation (b) Statutory Insurances
7	3 hours	(a) Insurance Accounting and Expense Analysis (b) Premium, Loss, and Expense Reserves
8	2 hours	Individual Risk Rating
9	3 hours	Advanced Insurance Problems

Beginning May 1970: Parts 1, 2, 3, 5, 7, 9.

*Beginning November 1969
Parts 1, 2, 4a, 4b, 6, 8. However,
beginning with May 1970 Part 4
must be taken in its entirety +
any previous credit for 4a or 4b separately
expire.*

SYLLABUS OF EXAMINATIONS
(Effective with 1969 Examinations)
ASSOCIATESHIP

Part	Time Allowed	Subject
1	3 hours	General Mathematics (jointly sponsored with the Society of Actuaries)
2	3 hours	Probability and Statistics (jointly sponsored with the Society of Actuaries)
3	2 hours	Compound Interest and Life Contingencies
4	3 hours	(a) Principles of Economics: Theory of Risk and Insurance (b) Insurance Coverages and Policy Forms
5	3 hours	(a) Principles of Ratemaking (b) Insurance Statistics and Data Processing
FELLOWSHIP		
6	3 hours	(a) Insurance Law; Supervision, Regulation, and Taxation (b) Statutory Insurances
7	3 hours	(a) Insurance Accounting and Expense Analysis (b) Premium, Loss, and Expense Reserves
8	2 hours	Individual Risk Rating
9	3 hours	Advanced Insurance Problems

TRAVEL TIME

I. INTRODUCTION

Travel Time is one of the additional considerations emphasized by the EPC in its White Paper. The intent of the EPC is to eliminate or minimize any potential disadvantages that a partitioned examination system might have on these considerations: "the intended effect in all such areas" are to be "clearly described". There is one specific consideration addressing Travel Time:

Travel time should be affected as little as possible.

There is also a consideration that implicitly relates to Travel Time:

There should be minimal effect due to any new system on candidates succeeding under the current system.

This consideration would also focus on the effects the transition to a partitioned examination system will have on candidates successful under the current system.

In addressing the Travel Time considerations in Section II, several different issues will be examined. These issues bear on certain qualities of the examination system that will be affected by partitioned examinations and the resultant effects on various types of CAS candidates. They are important attributes to consider when evaluating an examination process under a partitioned structure. This discussion will be followed in Section III by a presentation of changes to the examination system and implementation methods that would likely affect Travel Time. The evaluation of these items against the White Paper Criteria as prioritized by the Task Force then follows in Section IV before a final concluding section (Section V).

Appendix 4

For the sake of clarity, a few initial remarks are in order. When speaking of partitioned examination units, the term "examination unit" will be used to refer to an individual "stand alone" examination that is a partition of an "examination group". An examination group, in turn, is meant to basically correspond to a single examination Part in today's environment.

In the discussions surrounding current successful candidates, no judgment is made as to what would constitute successful candidates in the future, with or without partitioned examinations. Given the discussions addressing the future of the actuarial profession, there is a distinct possibility that tomorrow's successful candidate, when spoken of in the same light as today's successful candidate, may possess certain attributes and exam passing qualities that may very well be unlike today's. Furthermore, their exam performance may also differ with respect to the frequency with which exams are passed or the number of exams sat for over a period of time. For comparison purposes, the evaluation of exam performance may need to translate exam units under a partitioned system to a basis equivalent to today's examination parts. Hence, the pace at which today's successful candidate progresses through the examination parts is the focal point of all comments in this regard.

Finally, a working definition of Travel Time is needed. In this report it is defined as the number of separate examination sittings beyond Part 3 required by a candidate to attain fellowship in the CAS. Travel Time may be further defined by the context in which it is used, e.g. the average Travel Time for all 1988 Fellows.

II. TRAVEL TIME ISSUES

CURRENT SUCCESSFUL CANDIDATES

All other things being equal, partitioned examinations at first glance might be expected to increase the number of sittings, and therefore Travel Time, of today's successful candidates. If an otherwise successful candidate is required to compete at the same level as today for passing an examination unit, then the increase in the number of separate exam units may leave the candidate passing some but not all the units that are equivalent to one of today's examinations.

It is our a priori judgement that partitioning would increase the travel time of currently successful candidates. This effect is expected because the candidates would have to display competency at a finer level of examination. As such the "subsidization" intrinsic in today's process, wherein a strength in one area of the syllabus can buttress a weakness in another area of the syllabus, will be reduced. This is difficult to measure empirically without sampling and evaluating by way of illustration the performance of all candidates in the sections of a given examination as it now stands. The sections of today's examinations represent the most readily available means of recasting them on a partitioned basis.

In order to better analyze this issue, it may be necessary to record candidates' scores on some partitioned basis for a period of time before a strict partitioned examination system is actually implemented.

LESS SUCCESSFUL CANDIDATES

A less successful candidate may require several sittings in order to pass an examination part. On the surface it would appear that partitioned exams might allow the candidate to pass an examination unit in an area in which the candidate is strong and thereby provide the candidate with at least some progress at any one sitting. Subsequent sittings would require that the candidate only pass those remaining exam units that have not yet been passed. All other things being

equal, some such candidates will likely pass the equivalent of one of today's examinations in fewer sittings. Some of these candidates may progress further along in the examination process and complete the examinations given the the measure of success offered by partitioned exams. For candidates in this category seeking to strike an effective balance between study and work commitments, partitioning offers additional alternatives.

NEW ENTRANTS AND MARGINAL PERFORMERS

In the future under a partitioned examination system, there will be some new entrants into the examination process as a direct result of partitioned examinations. These candidates would not have entered the examination process under the current system but are attracted by a partitioned system. The opportunity will exist to sit for smaller examination units vis-a-vis today's examinations. These candidates may continue taking exam units over a long period of time so long as they experience some success. Inclusion of this group may result in an apparent Travel Time increase.

There is another group of candidates whose decision to enter the examination process will not be affected by the partitioning issue. This group represents marginal performers who are not able to make significant progress under the current system. It must be considered that such candidates may not remain in the examination process as long under today's environment.

While precise identification of these groups will not be possible, their existence must be recognized in order to make reasonable and consistent assessments of exam performance when evaluating Travel Time effects.

COMPETITION

Exam strategies will undergo change under a partitioned examination system. Each candidate will pursue his/her best strategy given his/her strengths, weaknesses, performance history, ambition, and study budget. The level of preparedness for an individual exam unit will likely increase

relative to the level that exists today for an examination. This will result in increased competition from candidates concentrating on one or two partitioned exams as opposed to the equivalent full examination today.

To the extent that successful candidates perform poorly on some section of one of today's examination parts, partitioning would result in the additional accumulation of candidates that correspond to this group who are weak in a given exam unit. This would result in a less competitive situation for stronger candidates, all other things being equal. The redefined notion of competition at the exam unit level may be more acute, or pronounced, than competition at the 1989 examination part level. Put another way, the greater variability in performance by candidates at the exam unit level must be recognized.

If examination units under a partitioned system are meant to stand alone, both as to their actual offering (sittings) and recognition for successful completion, then it becomes necessary to discriminate among candidates at this more refined level. Establishing a competitive performance standard at the examination unit level, somehow equivalent to that which exists today at the examination part, requires striking a balance between the forces working to increase and decrease competition.

EQUITY

Performance standards are meant to assure "fair and equitable treatment of all candidates" under a partitioned examination system as specified by another consideration in the EPC White Paper. It would seem that an inequity is created in the evaluation of candidates under a partitioned examination system if some candidates are concentrating on only some of the exam parts within an examination group while others focus on the entire examination group. To some extent one could argue that this situation exists today. However, the disparity among candidates as to the total number of exam units written during one examination period will increase under partitioning over today's levels. Partitioning will create an environment where stability in the fair and

Appendix 4

equitable treatment of candidates at the exam unit level will undergo disruption and where that equity will be more difficult to maintain once it is "achieved".

Since partitioning, at the minimum, affords the recognition of "minimum competency" at the exam unit level, there is an additional measure of equity at the examination group level that can be considered. Equivalency of equity at the exam group level and equity at the 1989 examination part level may be desired.

There is a close relationship between equity and competition as further discussions will point out. Partitioning must strike a balance between inequities at the examination group (1989 part) level, associated with surges in competition, and increased focus on equity at the exam unit level, associated with minimum competency standards.

III. CHANGES TO THE EXAMINATION PROCESS AND IMPLEMENTATION METHODS

In Section II we illustrated the effects that partitioning might have on the students taking the exams. In this Section we list those changes we can make, either to the way exams are given or to the way the exams are structured, to control those effects.

A. Changes to the Examination Process

1. Passing Ratios

A direct influence on Travel Time that relates to the issue of performance standards is afforded by Passing Ratios. This represents the percentage of all candidates that are successful in passing a given exam. It can be fine tuned to exclude ineffective candidates who fail to achieve a "minimum grade", less than fifty percent of the passing grade. The passing grade controls the passing ratio.

All other things being equal, it is obvious that an increase in passing ratios will produce more successful candidates per examination or examination unit and, in the long run, it will decrease Travel Time.

2. Examination content

The amount of subject matter to be tested directly affects the study time needed to pass an examination. Increasing the volume of material tested per examination hour, or increasing the volume in the aggregate, can be construed to increase Travel Time. With partitioning, it would seem less onerous to add material to the examinations. There would therefore be enhanced opportunities to increase "Travel Time" as measured by material contained in the syllabus.

3. Examination Length as Measured by the Number of Questions

A smaller number of questions within an examination or examination unit can make it more difficult to accurately discriminate among candidates. This may cause some candidates to fall into a marginal group if they just miss a passing grade because the evaluation afforded by the question mix was not sharp enough. Erring on the conservative side, i.e. passing fewer candidates than more candidates, penalizes those candidates in the marginal group.

4. Examination Length as Measured by Examination Hours

If the number of questions were not altered for an examination today, then increasing the amount of time with which to write the exam will reduce stress on candidates and allow them to perform closer to a true representation of their abilities. Discrimination would be enhanced and perhaps Travel Time reduced for some candidates.

A further variation is to also increase the number of questions with or without increasing the amount of time given for writing the examination. This should also improve discrimination but will have less influence on the stress element.

5. Essay Questions

More essay questions will force the greater assimilation of several subjects and concepts even at the examination unit level. Although grading could become somewhat more subjective, the opportunity to provide greater discrimination exists. This in turn can decrease Travel Time.

6. Open Book Examinations

This might be an alternative for the less critical exam units or for those exam units that cover a vast amount of material.

7. Varying Examination Passing Standards

As a further variation on the minimum competency and proficiency standards introduced earlier, it may be feasible to reduce the degree of competency or proficiency required on some exam parts and perhaps increase them on others. Less critical exam units, such as economics, might carry lower competency or proficiency standards than the more critical exam units, such as ratemaking or reserving. Changes in competency level requirements can be used to affect Travel Time.

8. Frequency of Offering Examinations

At some time in the mid-seventies during the transition to new standards for Associateship, some CAS examinations were offered twice a year. The increased opportunity to pass an examination provides a method where Travel Time per se may not be affected but the total elapsed calendar time to fellowship can be reduced for some candidates. It is conceivable that there could be more than two examination cycles a year.

9. Separation of Examination Units

It may be possible to alter the frequency with which exam units are offered in the future while still maintaining the annual examination part cycle that exists today. This would entail offering all exam units for a given examination group within a six month period while splitting the exam units of a given examination group between two, maybe even three, sittings. Exams would take place more frequently, say every three months. All candidates would be competing for the same exam unit without regard to other units within an examination group. For example, an examination partitioned into two exam units would result in one exam unit being offered in February and the other in May. This approach would maintain the same total examination

hours between an exam group under partitioning and the equivalent 1989 examination part. It also affords the opportunity whereby candidates are provided equivalent preparation and study time which reduces competitive inequities introduced by offering all exam units of an exam group at the same time.

B. Implementation Methods: Competency and Minimum Performance

There are several partitioned examination implementation Methods that are worthy of discussion. They present themselves when the effects on a less than perfect candidate presented earlier are considered more carefully. Suppose that an examination group is offered in several exam units. For each unit there are minimum competency and proficiency performance possibilities, the latter requiring a higher empirical exam grade. Further, the examination group is assigned an overall passing grade developed from the grades of the individual exam units. A candidate would earn credit for an examination group and all its units by attaining an overall examination passing grade. A candidate could also earn credit for an exam unit by attaining minimum competency grades on all units and a proficient grade on the exam units(s) for which credit is given. Partially successful candidates would still need to take the full examination group in order to pass the other exam units, but the candidate would need only maintain minimum competency grades on those exam units already earned.

Transition rules would need to be devised so that a student is not penalized if exam units within an examination group are exchanged for others or if an exam unit passed by the student is dropped from the syllabus altogether. For example, if a student passes one exam unit in an examination group but that exam unit is subsequently replaced by another, then the student starts anew with the examination group. If the exam unit the student passed is moved to an examination group that the student has already gained credit for, then the student

is penalized in that no benefit was gained from having passed that exam unit. Similar invisible penalties can be incurred under the current system when subject matter is moved from one part of the syllabus to another.

Another possible Method would be to provide credit for an exam unit if the candidate obtains a proficient grade on that exam unit or provide credit for the entire examination group if the candidate achieves a minimum competency grade on all exam units at the same time that an overall passing grade is achieved. If any exam units are passed, then the student may obtain at future exam sittings a proficient grade on those exam units of the examination group that remain to be passed in order to obtain credit for them. Exam units could be taken individually and therefore stand on their own as independent "examinations". It may be possible that under this Method a student may feel it is to his/her advantage to take the entire examination group all over to obtain an overall passing score rather than what may be perceived as the more difficult to obtain proficient scores on the remaining exam units.

Yet a third variation would require minimum competency grades for individual exam units and an overall grade which would vary inversely with the number of exam units taken. For example, if a candidate sat for units A, B, C, and D, then the overall grade needed for passing might be 55% compared to 60% if only units A and B were written. Minimum competency for all exam units is implied by the overall grade so no credit would be received if the overall grade was below the passing grade even though the candidate did very well (proficient grade) on one exam unit.

IV. EVALUATION OF METHODS AND CHANGES

A. **Overview**

In the previous section, changes to the current examination process and a series of implementation methods for a partitioned examination system having some bearing on travel time, were presented. To assist in the evaluation and comparison of these various items, they are summarized below:

1. **Changes to Examination Process:**

The first seven types of changes are presented as methods that have some influence in the way students' knowledge are tested. The last two are presented as methods that can influence students' exam behaviors.

- 1) Passing Ratios
- 2) Examination content
- 3) Examination Length as Measured by the Number of Questions
- 4) Examination Length as Measured by Examination Hours
- 5) Essay Questions
- 6) Open Book Examinations
- 7) Varying Examination Passing Standards
- 8) Frequency of Offering Examinations
- 9) Separation of Examination Units

2. **Implementation Methods:**

The three approaches outlined below represent alternatives to stand alone exam units. They are

meant to suggest alternative ways to measure standards of achievement. Their descriptions indicate the basis upon which credit for an examination unit is given.

Method A

- 1) Overall passing score on exam group or,
- 2) Minimum competency on all exam units with minimum proficiency on exam unit(s) for which credit is received.

Method B

- 1) Minimum proficiency on the exam unit or,
- 2) Minimum competency on all exam units with overall passing score on exam group.

Method C

Minimum competency on exam units and an overall passing score which varies by the number of exam units taken.

There are three broad methods of "offering" examinations in smaller units. An evaluation must be made as to the suitability of alternatives to letting each exam unit stand on its own as being in the spirit of the intent of the EPC with respect to PES. The three broad methods are:

- 1) Offer exam unit sittings but provide credit only on an examination group basis once all units have been passed.
- 2) Offer credit for smaller exam units but require that the overall score on all exam units in an exam group written at the same sitting affect obtaining that credit.

- 3) Offer both sittings and credit at the exam unit basis. Examination groups are essentially irrelevant except when designating ACAS or Student status.

The last method listed is that which everyone seems to be thinking about. Under such a method it seems very difficult to satisfy the intended resolution of the Travel Time issue vis-a-vis today's standards.

The three implementation Methods offer alternatives to the third level above. Each of them involve the use of different focal points regarding the issues of competition and equity.

B. Changes to Examination Process

1. Introduction

As illustrated in the previous section, each of the Methods have, in their own way, a direct bearing on Travel Time. In assessing the various Methods, the actions for each which result in increased versus reduced Travel Time are identified. These need to be compared with the Decision Criteria that have been identified as critical by the PETF. Where a significant impact results on other criteria, those criteria are also discussed.

2. Discussion of Changes

1) Passing Ratios

Everything else being equal, increasing passing ratios (or reducing passing grades) would decrease Travel Time.

Such an action runs counter to the Educational Objectives, as it allows for lower standards of educational achievement. It also infers a different type of FCAS, potentially allowing for marginal candidates to acquire the coveted professional designation.

Quality of Education should not be affected by this change. The administration of examination should also not be materially affected.

2) Examination Content

Increasing the amount of subject matter to be tested could be seen as increasing Travel Time. Conversely, streamlining or reducing current exam material for a given exam unit could effectively decrease Travel Time.

However, in an attempt to streamline the exam material for smaller exam units, there is a risk that there will not be a sufficient amount of subject matter remaining to fairly measure educational achievement. This risk is even more so if some exam material is actually dropped from the syllabus. Such actions certainly run counter to the Educational Objectives criterion.

Quality of Education should not be affected too much to the extent that critical pieces of subject matter are retained. Dropping some of those critical syllabus items without replacing them with material of similar import might result in a lower Quality of Education.

By streamlining exam material, there is a potential that FCAS graduates will ultimately lack certain skills or discipline in the areas of time management, memory capacity, synthesis and the ability to isolate important material.

3) Examination Length as Measured by the Number of Questions

A larger number of questions within an examination allows for better discrimination among candidates. To the extent that one increases the number of questions, the margin

of error in accurately assessing passing and failing performances will decrease. This is even more important for smaller exam units where the number of questions tend to be small.

With smaller exam units, one should strive to have a higher ratio of questions to the amount of subject matter in order to avoid an increase in Travel Time. In this way it may be possible to improve the way educational achievement is measured, thus responding to the Educational Objectives in a positive manner.

The Quality of Education and Type of FCAS criteria should not be affected by increasing the number of questions. The increased number of questions would translate into an increase in the administration of the exams.

4) Examination Length as Measured by Examination Hours

Allowing more time to answer the same number of questions, everything else being equal, also results in an improvement in the discrimination characteristics of an exam.

Increasing the exam length implies a change in the standard of educational achievement. To the extent that today's standard is to measure the ability of the candidates to perform well within a certain time constraint, any increase in time allowed would run counter to the current Educational Objectives.

Similarly, the Type of FCAS emerging in the future may change. The Quality of Education should not be affected. There should be no effect on the administration of the exams.

5) Essay Questions

Restricting exams to essay type questions also results in an improvement in the area of discrimination. Eliminating quick multiple choice "trap" questions will force candidates to concentrate more on the subject matter itself. This obviously results in a slight deviation from current standards of educational achievement which should be regarded as a positive outcome.

The Type of FCAS might also be different, but again it should be seen as a positive outcome. Quality of education should not be affected. Exam administration would increase as a result of the extra demand placed on fairly correcting these essay type questions.

6) Open Book Examinations

This is not anticipated as having any material impact on Educational Objectives or Quality of Education. It can affect the Type of FCAS as it focuses on the synthesis and application of subject material. Administration will be more difficult in the areas of creating questions for examinations and grading.

7) Varying Examination Passing Standards

One way to limit increases in travel time as a result of Partitioning would be to allow for varying passing scores on the various exam units. A higher level of competency would be required on units considered critical. Those would be the exams testing basic areas of knowledge and skill necessary to obtain the competence to practice in the various actuarial specialties. Two examples of such basic areas would involve exam units testing ratemaking and reserving techniques. A lower standard would

be required on units involving complementary knowledge. Subjects such as Economics, Finance, Policy forms and Coverage, etc. would seem to be areas where one need only assert minimum competency.

Although varying passing standards explicitly results in a change in the way we measure educational achievement, it makes it easier to focus on one of the fundamental CAS principles of fostering a program of actuarial education. Hence the current Educational Objectives could still be preserved under some system of varying passing grades.

Similarly, it is reasonable to believe that the Type of FCAS would be different as a result of these changes because of the way achievement would be measured. Again, this outcome should not necessarily be interpreted in a negative way. A better Type of FCAS may very well emerge!

Quality of Education should not be affected by this change. The Administration of Examinations should also not be materially affected.

8) Frequency of Offering Examination

This type of change, even though it does not reduce the number of sittings to completion, allows candidates to perform at a faster pace. Under such a scheme, exam units beyond what is today Part 3 would be offered more than once a year.

This type of change does not have any bearing on the Educational Objectives, Quality of Education or Type of FCAS criteria. It would add a significant burden to exam administration

and could seriously injure the ability to adequately staff the Examination Committee on a volunteer basis.

9) Separation of Examination Units

This change entails spreading out the units within an exam group over the entire exam cycle. The elapsed time between successive units could be established based on the volume of material or based on the expected number of study hours needed to prepare for each unit. Travel time by itself is not affected under such a scheme, but it does reduce the competitive inequities that arise from a partitioned examination process.

This type of change does not have any bearing on the Education Objectives, Quality of Education or Type of FCAS. It does however have some bearing on the administration of the exams. It would appear that even though the work within an exam committee could be subdivided into parts, the sum of the workloads involved with all the subdivisions might be more than the workload of administering a single exam group sitting. For each unit within the cycle, some work might be duplicated and some of the resources might also grow thin. This may be most pronounced when an exam cycle is split into more than two sittings.

3. Synopsis of Changes to Examination Process

Each of the changes was discussed in comparison to the Critical Decision Criteria. These changes are not mutually exclusive with respect to implementation, which means that they can be used with one another. For example, spreading out the exam cycle could be used in conjunction with frequency of exam offering. Exam cycles could be offered twice a year, combining the advantages of the two schemes. This could however compound the problem of the administration of the exams.

Some of the changes were weighed against the increased administration of exams, even though this was not identified as a Critical Decision Criteria. To the extent that some degree of computerization is achieved, administration of exams might be less of a concern in certain respects. A computerized student data base would certainly help administration.

C. Implementation Methods

1. Introduction

In this second part, different approaches of measuring the standard achievement on partitioned exam groups are compared to the simple case of having a single standard for a stand alone exam unit. In other words, should we recognize different standards for candidates writing more than one unit within a exam group? The goal is to reduce if not eliminate the competitive inequities that could arise with exam partitioning.

These Methods also attempt to resolve the philosophy implicit in the examination process as to equity at the examination group, equivalent to a 1989 examination part, and equity at the partitioned examination unit level. They also address how offering examination group (examination parts in 1989) in smaller (exam) units can be incorporated into a partitioned examination method.

2. Discussion of Each Method

Method A

Under Method A, a candidate would get credit for all the units within an exam group by achieving an overall passing score. If a candidate does not obtain the overall passing score, he or she can earn credit for a single unit if there is minimum competency on all units and a minimum proficiency on that

particular exam unit. The candidate would have to write all units again to get credit on remaining units but would be required only to show minimum competency for the particular unit for which partial credit was obtained.

The main advantage of this approach is that it totally eliminates competitive inequities at the exam group level. Under this approach everyone has to write all the units of an exam group within the exam cycle. This approach also retains the feature of testing the candidate's ability to synthesize a large volume of exam material. It also has the advantage over Method C of establishing only one overall passing score.

On the other hand, aside from being hard to explain, the Method might not be easily understood by the students at large. It might also have the undesirable feature from the student's perspective of eliminating the advantage of partitioning altogether since the candidate is required to write all units of an exam group within the exam cycle. Moreover, this approach is not flexible in that it does not easily allow for deletion of certain units and addition of new ones. It does not allow for a candidate outside the CAS, such as an SOA student or a future candidate pursuing an FCIA designation that must gain credit for both SOA and CAS examinations, to write only some smaller number of units and obtain credit toward their own professional designation. It also shares the disadvantages with the other two Methods of having many performance standards to administer.

This Method attempts to provide equity at the exam group level while providing for competition at the exam unit level. Competition at the exam unit level is expected

to be sharper hence the use of a proficiency score at that level.

Method B

Under Method B, a candidate would get credit for all the units within an exam group by achieving an overall passing score and minimum competency on all exam units. If a candidate does not obtain the overall passing score, he or she can get full credit on a single unit by demonstrating minimum proficiency on that particular exam unit. In addition, the student can sit for selected units only and obtain credit by achieving proficient scores.

This approach has the advantage of reducing competitive inequities. It has the advantage over Method A of allowing for credit on single units. It also has the advantage over Method A of allowing the candidates to write only certain units as opposed to all. It has the advantage over Method C of requiring only one passing score.

Like Method A, it also has the disadvantage of having many performance standards to administer. Finally, even though it does reduce some of the competitive inequities, it does not fully eliminate them. It maintains equity to an extent at the examination group level, equivalent to a 1989 examination part, and adds the ability to obtain credit on a partitioned basis. The introduction of the equity issue when exam units are written alone distinguishes it from Method A.

Method C

Under Method C, a candidate would get credit for all the exam units within an exam group by achieving an overall passing score and

achieving a minimum competency score on each unit. However the overall passing score would vary inversely with the number of units the candidate elects to write.

This Method also reduces the competitive inequities although it does not fully eliminate them. It has the advantage over the other Methods of not having to establish a minimum competency standard when more than one unit is written. If only one unit is written, the passing score reduces to the proficiency standard.

It has the disadvantage relative to Methods A and B of having to establish more than one passing score.

This Method attempts to establish equity based on the number of exam units written. Technically, each combination presents its own standard. Contrast this Method with an extreme example today where a candidate passes an examination part by obtaining perfect scores on two (Sections A and B) out of three sections and no points on the third (Section C).

Under this Method, the same candidate sitting for units A and C might fail (assuming an overall score of 50% is failing) but would pass unit B. This indicates that this Method may need to employ overall passing grades lower than today's. It also indicates the potential for enhanced performance needed in the future to obtain the equivalent exam progress today.

3. Synopsis of Implementation Methods

The focus of these Methods are an alternative to having each exam unit stand on its own. To let each exam unit stand on its own, the CAS must address the likelihood of greater variability in candidates'

scores when compared to examination part scores today. If the same standards as today are applied to individual exam units, then the Travel Time of candidates under such a partitioned examination system will likely increase once a steady-state has been achieved. In order to avoid this undesirable increase in Travel Time, either educational standards must be relaxed or a reorientation of equity and competition is needed away from the individual exam unit level.

D. Concluding Remarks

The first part of this section covered avenues available to a Partitioned Examination System to help reduce or at least maintain current Travel Time.

The second part of this section covered alternative approaches to measure standards of achievement under a Partitioned Examination System. Each were presented as an improvement to the stand alone exam in the are of reducing competitive inequities.

As a final analysis one can try to combine some of the changes to the examination process with one of the implementation Methods described in the second part to produce the most desirable scenario under a Partitioned Examination System.

V. CONCLUSIONS AND RECOMMENDATIONS

In a steady-state environment, after the effects of the transition to a new examination system have disappeared, it is expected that the variability of candidates' performance at the exam unit level will be more variable than that at the 1989 examination part level. This means that without moving away from applying today's standards to exam units in the future, an increase in Travel Time cannot be prevented, and a significant increase is likely at that.

The question of equity occurs both at the exam unit level and the exam group level. An underlying philosophy as to how to offer examinations in smaller units must be established before these questions can be answered. Once resolved, the attention then turns to competition and its affects on Travel Time.

Some combination of changes to the examination process, perhaps employing an alternative to letting each exam unit stand alone, is necessary in order to preserve Travel Time at a level commensurate with that which exists today. When the variability of candidates' performance at a level below that of 1989 examination parts is considered, it is apparent that fairly significant changes must be made in the examination process if Travel Time is to be affected as little as possible.



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VICE PRESIDENT-CORPORATE ACTUARY

January 29, 1990

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Assistant Professor
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460 Commerce West
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RECEIVED

FEB 02 1990
CORPORATE ACTUARIAL
DEPARTMENT.

Dear Steve:

As I mentioned to you on the telephone the other day, a question has been raised regarding the accuracy of the pass ratio and travel time I provided you for CPA candidates.

It turns out that CPA pass ratios are much different from the ones I quoted. A publication called "CPA Candidate Performance on the Uniform CPA Examination" published by the National Association of State Boards of Accountancy (NASBA) provides a wealth of information.

As you may know the CPA exams consist of four different subjects that are tested in one sitting. There are two sittings each year. The four subjects are Theory, Practice, Auditing and Business Law. The NASBA publication distinguishes between first time candidates and repeat candidates. The relevant statistics are as follows:

Pass Ratios

	<u>All Exams</u>	<u>At Least One Exam</u>
First Time	20%	50%
Repeat	27-30%	55%
All	25%	53%

Our report recommends collecting background information on candidates. The type of information contained in this publication might be a good model for the CAS to follow. A portion of their exhibits are attached. I can send the entire book to the appropriate person in the CAS if someone will just tell me who that person is.

Yours truly,

Duchs

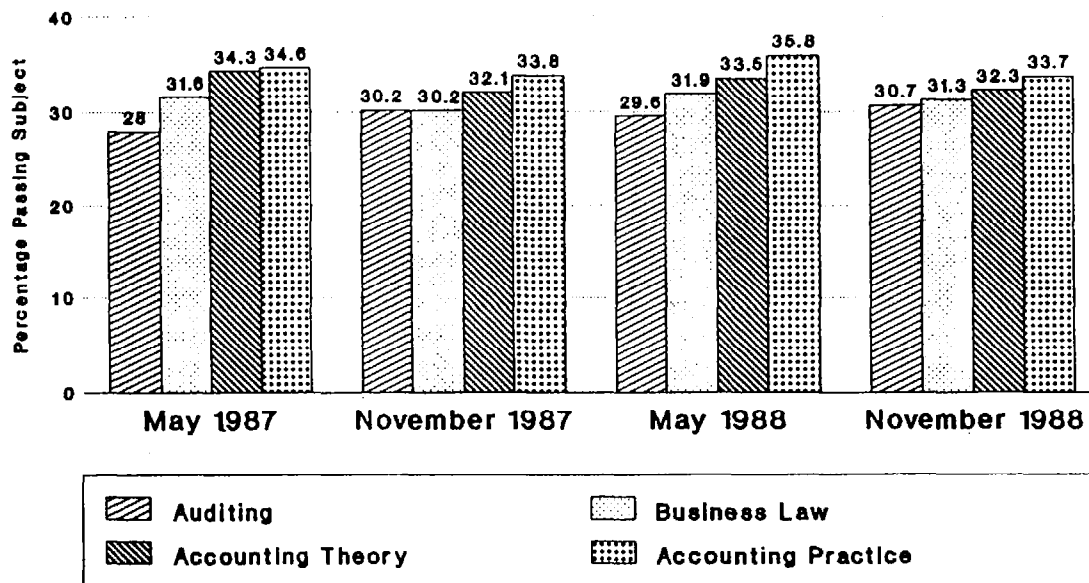
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Attachment

~~CONFIDENTIAL~~ Jerry Degerness
PETF (w/o exhibits)
Education & Testing Methods TF (w/o exhibits)
Michael Toothman

MAY 1988 TABULAR REPORTS

- 1 Performance of First-time Candidates by State
 - 2 Performance of Repeat Candidates by State
 - 3 Performance of Candidates by Highest Level of Education Achieved
 - 4 Performance of First-time Candidates by Major
 - 5 Performance of First-time Candidates by Overall Grade Point Average
 - 6 Performance of First-time Candidates by Semester Hours of Accounting
 - 7 Performance of Candidates by Accounting Experience
 - 8 Performance of First-time Candidates by SAT and ACT Scores
 - 9 Performance of Candidates by Number of Subjects Taken
 - 10 Performance of Candidates by Subject
 - 11 Performance of Candidates by Supplementary Study
 - 12A Performance of First-time Candidates without Advanced Degrees by School
 - 12B Performance of First-time Candidates with Advanced Degrees by School
 - 12C Performance of Repeat Candidates without Advanced Degrees by School
 - 12D Performance of Repeat Candidates with Advanced Degrees by School
- School Index (Total candidates for each college and university—identified as Report 14)

Chart 4 Passing Rates of First-time Candidates by Subject



395

Chart 5 Passing Rates of Repeat Candidates by Subject

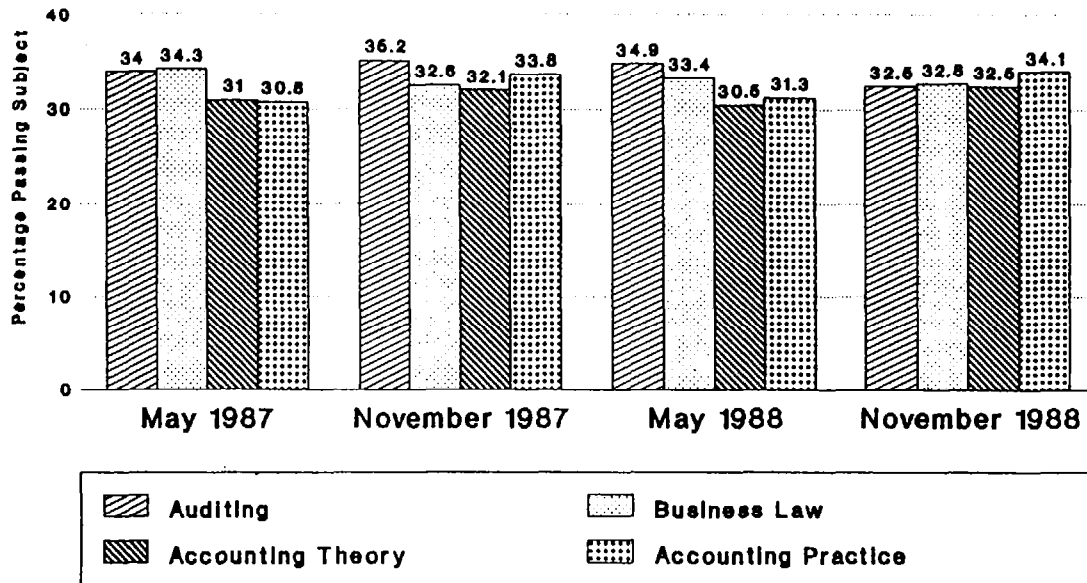


Chart 7 Passing Rates of First-time Candidates by Examination

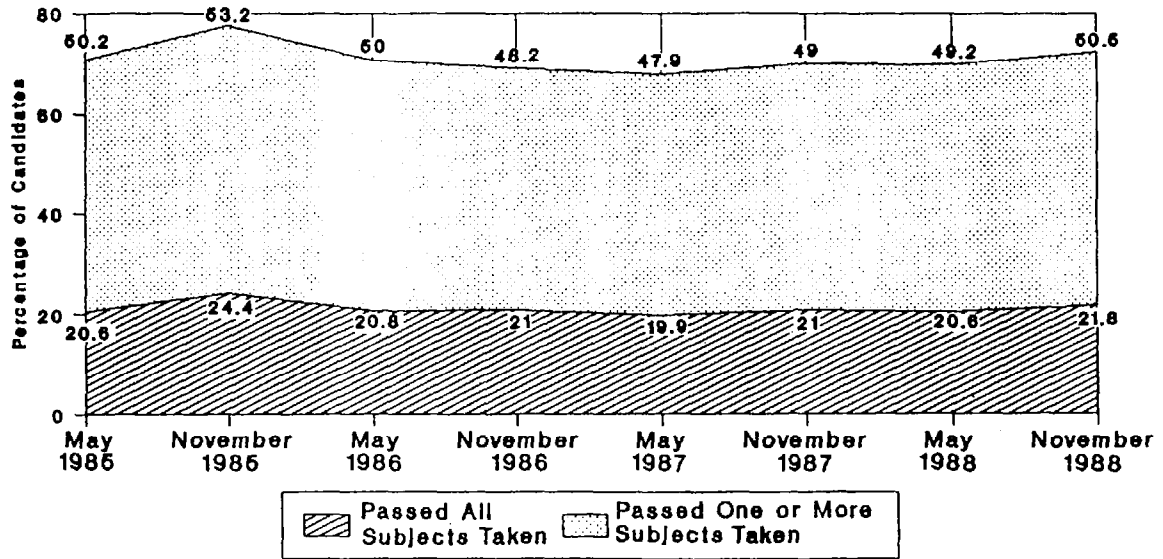


Chart 9 Percentage Passing Each Subject by Number of Sitzings May 1988

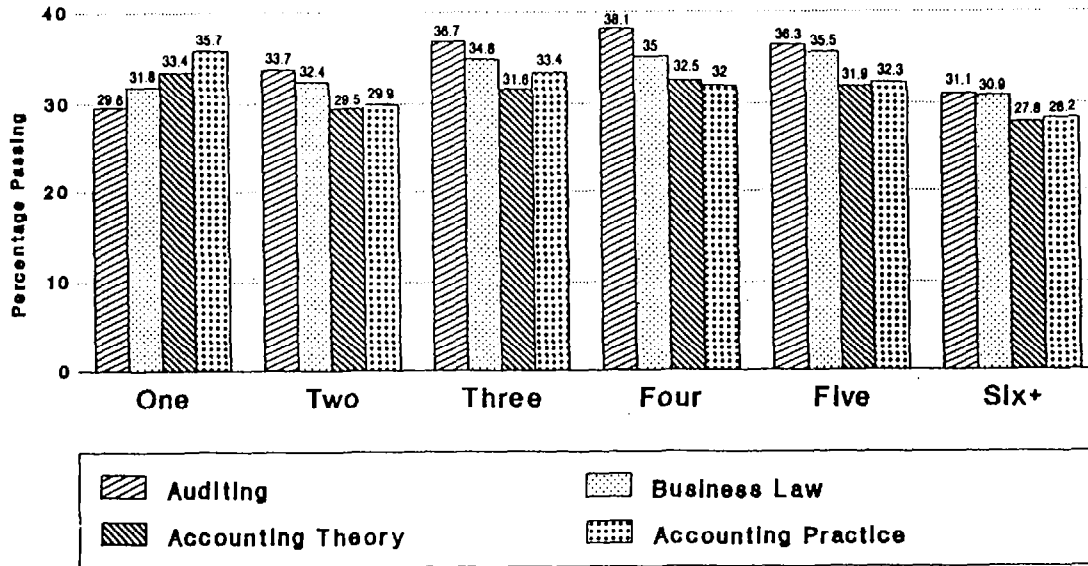
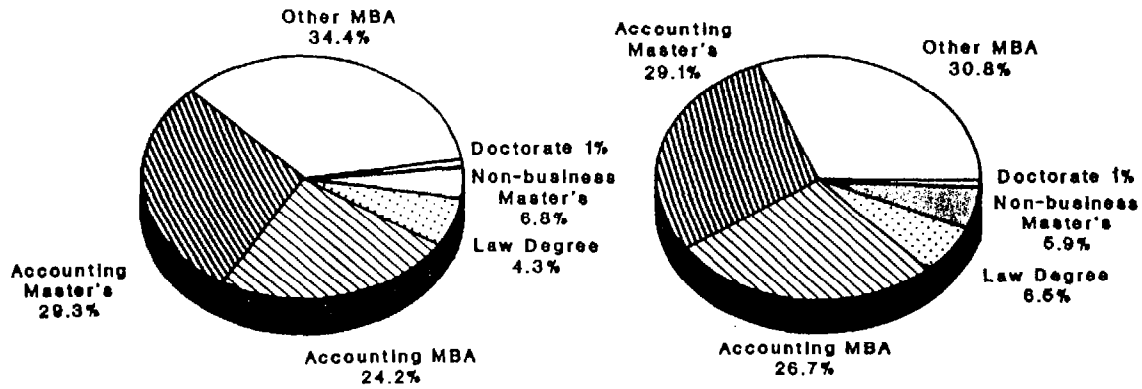


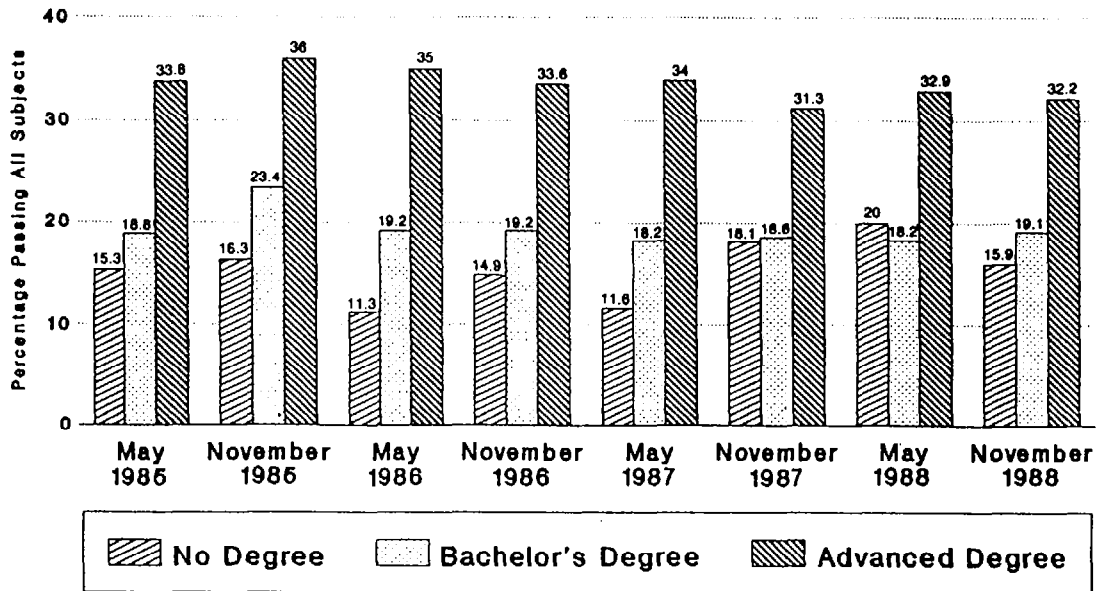
Chart 11 Percentage of Types of Advanced Degrees of First-time Candidates



May 1988

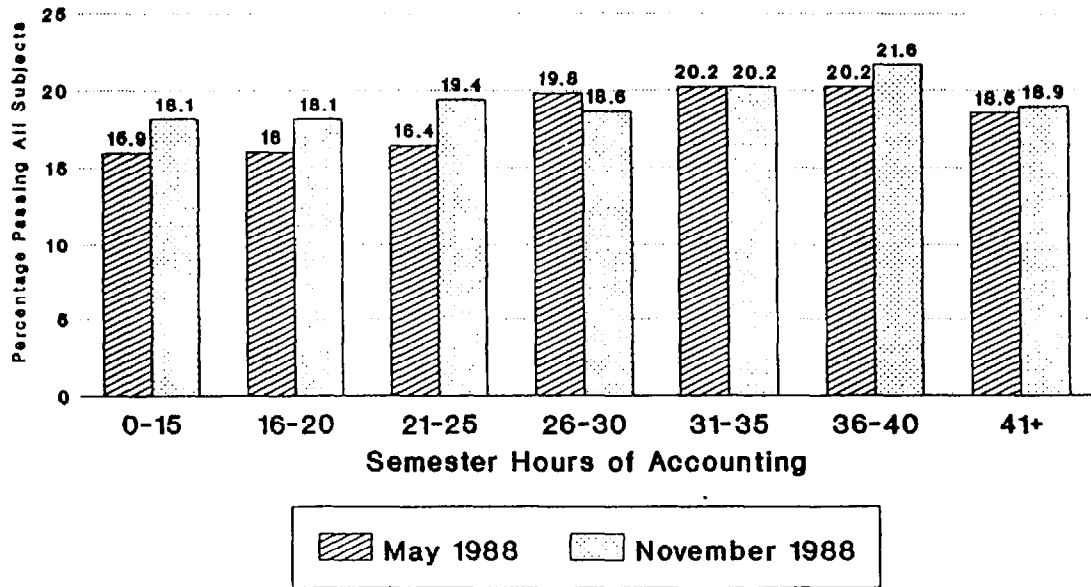
November 1988

Chart 13 Success by Educational Level of First-time Candidates



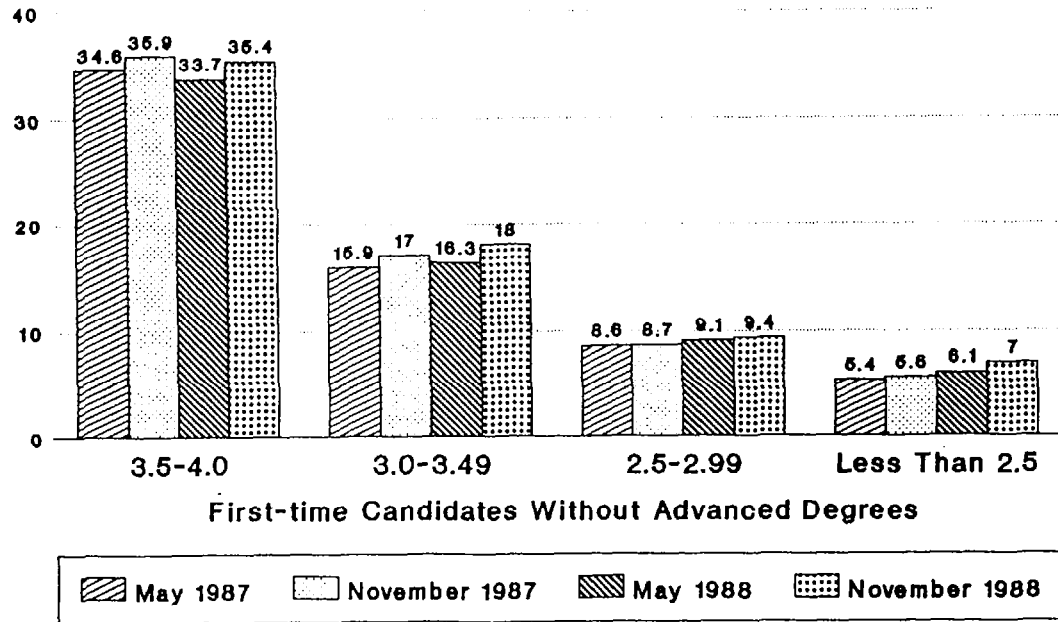
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Chart 15 Success by Hours of Undergraduate Accounting Study of First-time Candidates



401

Chart 19 Success by Undergraduate Grade Point Average



402

Chart 20 Success by Graduate Grade Point Average

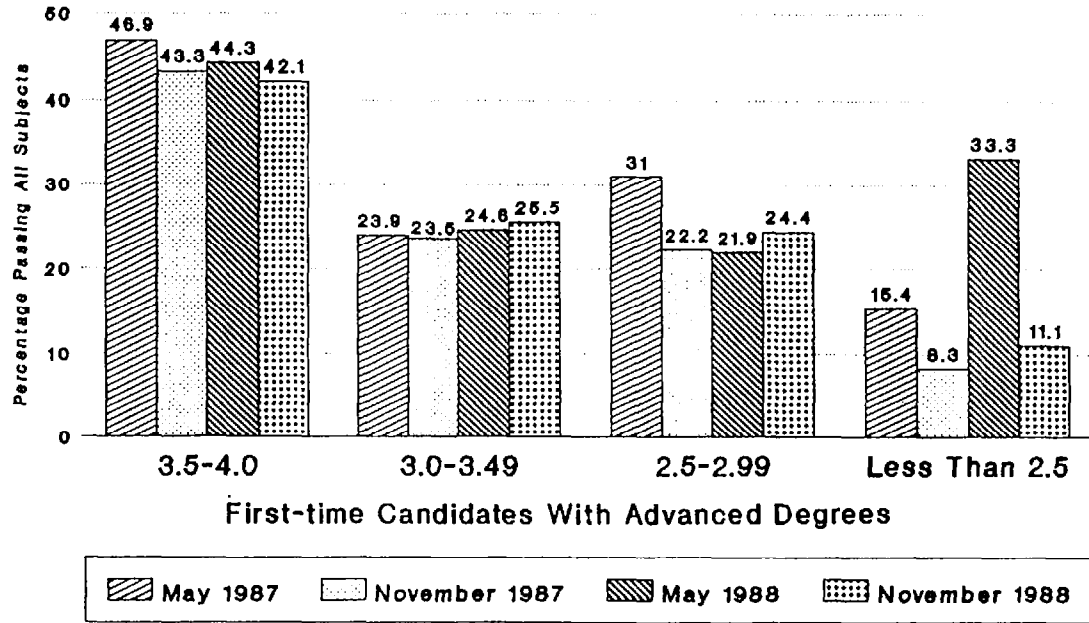


Chart 23 Success by Accounting Experience

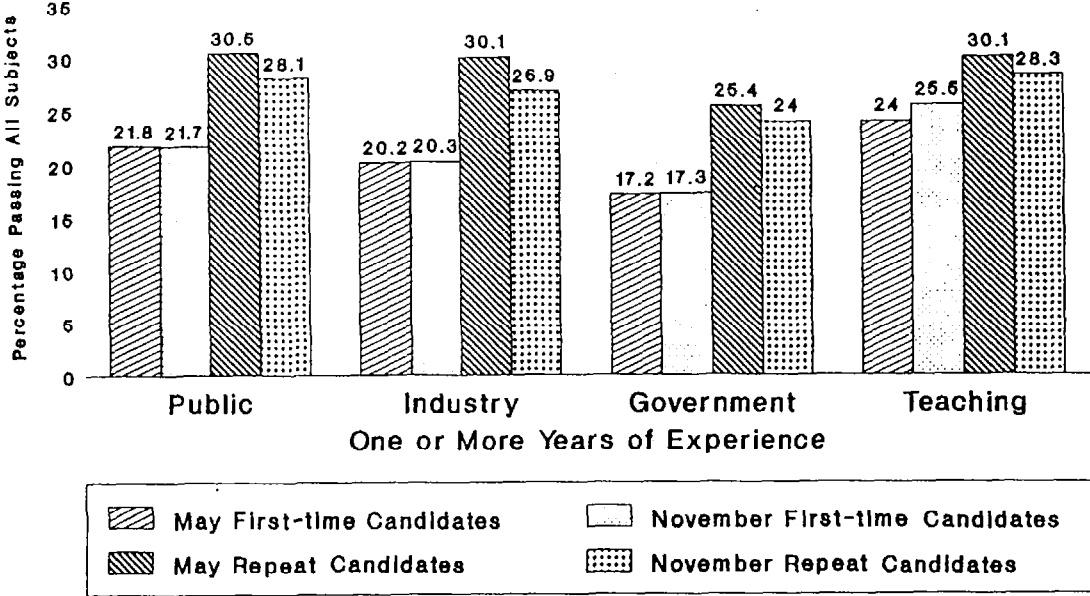


Chart 26 Success by SAT Verbal Scores of First-time Candidates

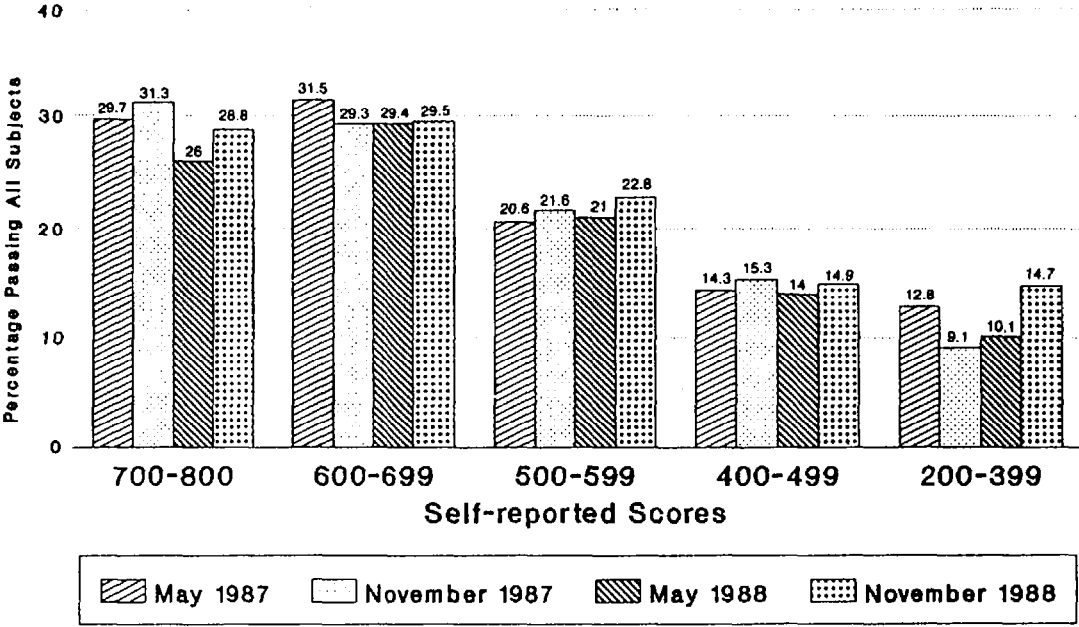


Chart 27 Success by SAT Mathematics Scores of First-time Candidates

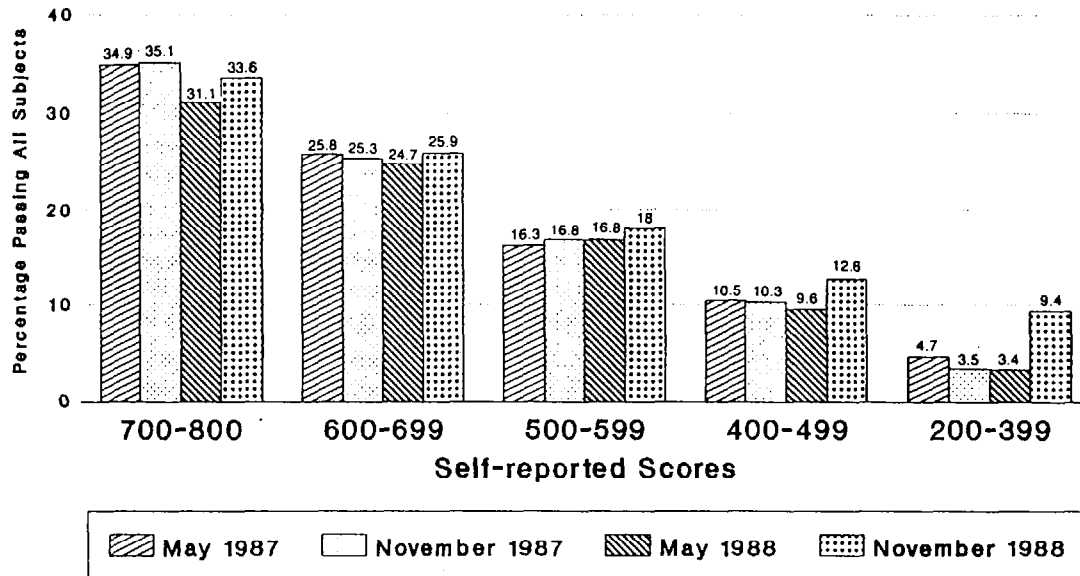


Chart 30 Success by ACT Verbal Scores of First-time Candidates

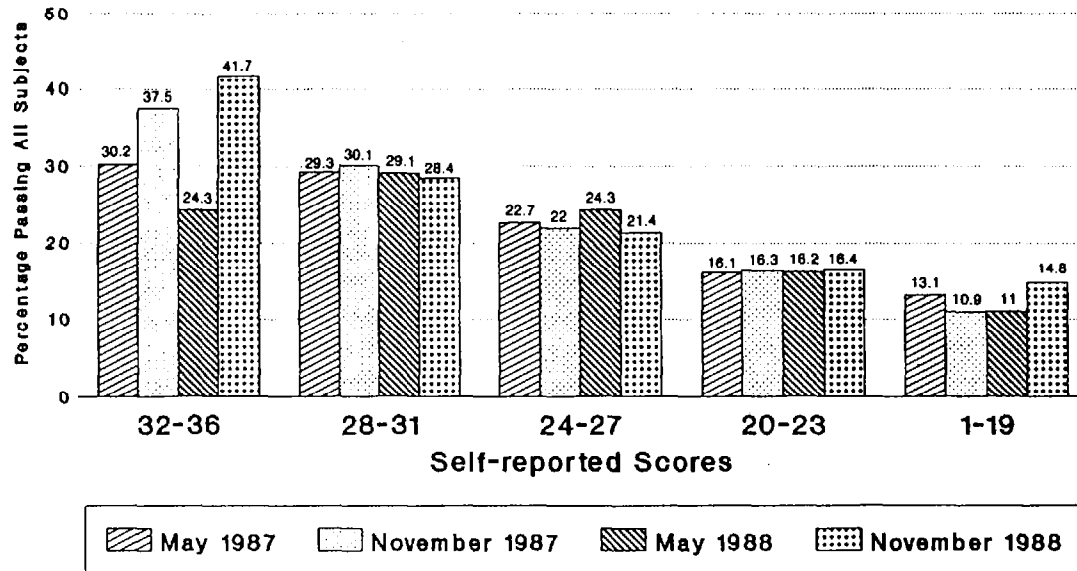


Chart 31 Success by ACT Mathematics Scores of First-time Candidates

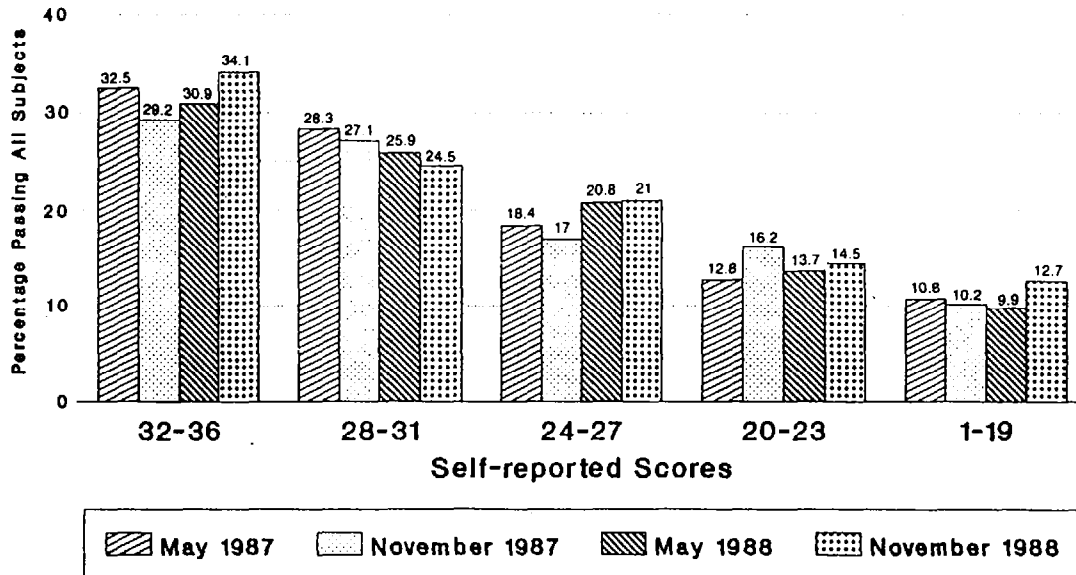
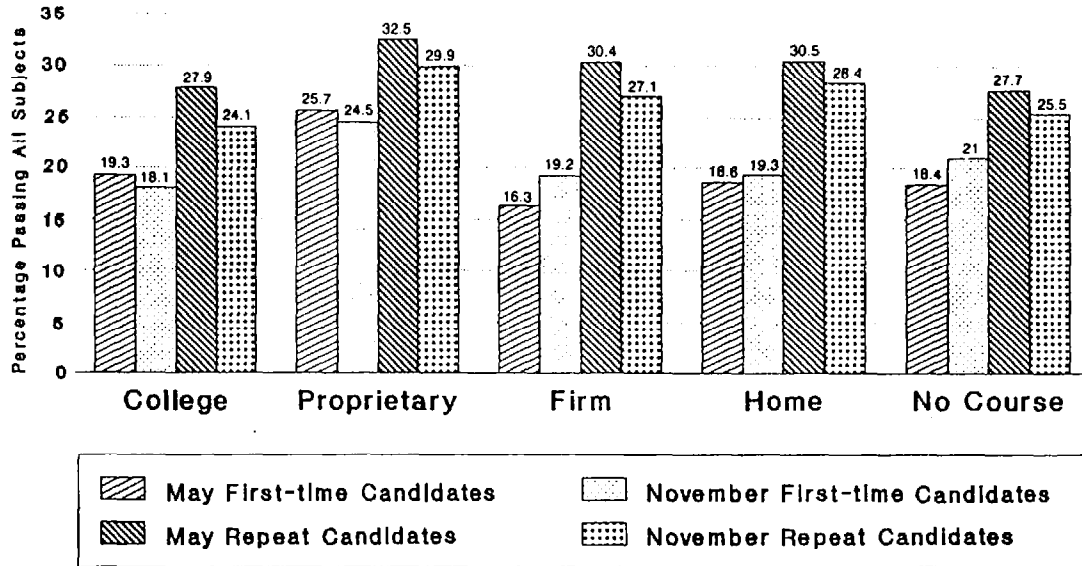
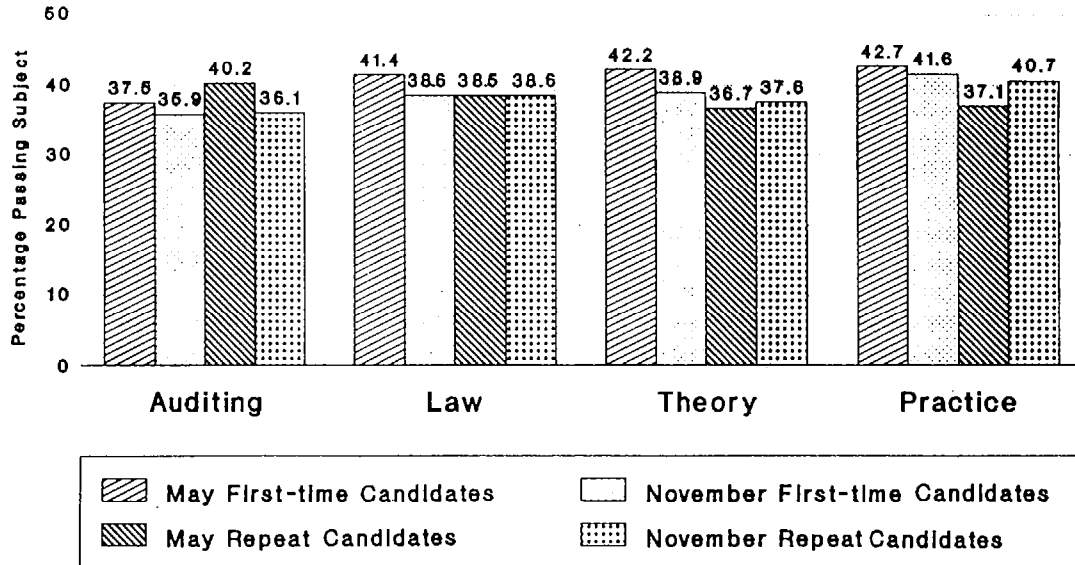


Chart 35 Passing Rates of Candidates Relative to Coaching Course Preparation



409

Chart 36
Passing Rates by Subject of Candidates
Who Took Proprietary Coaching Courses



MEMBERSHIP INPUT

Members Opposed Because:

1. Travel time concerns
2. Recruiting will be compromised
3. Synthesis skills not tested
4. Minimum standards don't require partitions
5. Cheaper FCAS
6. Credibility of scoring
7. Administration
8. Effect on employers
9. Lets in marginal performers
10. "One part" competitive pressure
11. Stress would increase
12. Emotional reasoning
13. Motivation - terminal ACAS
14. Memory would not be tested
15. CAS/SOA distinction would be vague
16. Current system is good
17. Time management would not be tested
18. Project management would not be tested
19. Less discipline would be required

Members In Favor Because:

1. Flexibility
2. Emotional reasoning
3. Small steps can be taken
4. Specialty tracks would be feasible
5. Travel time will improve
6. Clarity will improve
7. Synthesis can be preserved

Suggestions From Members:

1. Test synthesis skills by reflecting concepts from other parts of the syllabus
2. Give exams more often
3. Provide electives
4. Make exams nation specific
5. Eliminate essay questions

PARTITIONED EXAMS
JUNE 20, 1989 SYNOPSIS OF MEMBER INPUT
PREPARED FOR TASK FORCE BY GUS KRAUSE

Appraisal

1.

Opposed. Travel time issue. Recruiting
would suffer. 2

2.

Unconventional comments. Really skirts
the partitioning issue. Has some other
ideas unrelated to our task force
mission. Questions whether current exams
accomplish enough.

Adds nothing to what we have. 1

3.

In favor. Presents a rational argument
for specialty tracks at some future
point in time. 2

4.

In favor. Personal view dominant - he is a long-time associate. Highlights the choice for many as "small steps or none at all." 2

5.

Would favor if we can deal with travel time and "one part" competitive pressure. 2

6.

Opposed. Increased travel time. Uses part 3 as example. Strong opinion that partitioning will drive more people out of (or away from) the system. Nothing new, but strong opinion voiced. 2

7.

Opposed. As employer, travel time a real issue. ACAS could become a more frequent "terminal point."* Takes issue with the possibility of more marginal performers getting through. Favors requiring time and project management, discipline, memory

and synthesis skills. 3

*This point needs our clear attention.

8.

Favors. Would have personally traded some travel time for flexibility. As an employer, likes ability for partitions to track better with work assignments. 2

9.

Thinks FES is a done deal. (next membership mailing should clarify.) N/A

10.

Opposed. Thinks ability to more precisely test competence is not a significant benefit. Questions whether flexibility is real or perceived, with arguments and examples which are not very convincing. Travel time issue. If exams are partitioned, suggests that each part be truly independent, i.e., not 4a, 4b; Suggests capping exam time to two hours

and offering more frequently.

Opposition seems emotional due to extensive comments about how to partition. 2

11.

Opposed. Thinks primary benefit of partitioning would be to support electives and specialty tracks. Does not favor sacrificing synthesis for topical depth. His students are unanimously opposed. 3

12.

Favors (I think). Has broad criticisms of current E&E system. 2

13.

Opposes (I think). Partitioning will further stereotype the actuary. 2

14.

Opposed. Take wait and see approach,

i.e., learn more from SOA experiment.
May cheapen the FCAS designation. Will
be administratively more difficult and
current process is less than perfect
(typo's, lost exams, etc.). Prefers
minimum standards. Sees difficulty
with recruiting.

3

15.

Opposed. Travel time, e.g., part 3.
Points out an overwhelming majority
of people in San Antonio favored
minimum standards (i.e., 5*) to par-
titioning.*

2

*This can and should be documented.

16.

Opposed. Students have not indicated
a preference for SOA system. Current
system works very well; standards are
tight enough. Partitioning may drive
candidates away. Travel time; part 3
example. Clearly opposes any FES or
FEM change. Offers many comments on

an annotated White Paper Appendix

II-a. 3

17.

Opposed. Concern about competition, e.g., candidates writing one partition only. Travel time issue. Recruiting issue in terms of attractiveness. 2

18.

Opposed. Thinks 20 to 30 exams will discourage many potential candidates. Travel time issue. Competing issue, i.e., candidates taking only one part. Blurs distinction between CAS and SOA. 2

19.

Opposed. Was in favor due to flexibility, but major concern about travel time. Uses part 3 as example. Concern about fewer questions, thus lower credibility of statistics for a given partition. Concern about career attractiveness. Staffing committees a

- problem. Worried about whether our action is a response to SOA threat to offer casualty exams. 3
- 20.
- Opposed. Will drive candidates away. Travel time issue; uses part 3 as example. 2
- 21.
- Opposed. Prefers current system with minimum standards. Thinks member input represents our "going through the motions." Suggests a membership vote. 2
- 22.
- Favors. Will allow people to better balance personal, work and exams commitments. Thinks travel time will increase because we will require candidates to know the material in more depth. Number of people sitting for higher level exams could be quite low, with grading implications, i.e., distri-

- bution would not be smooth. 2
- 23.
- Opposed. FES could only be used with electives. Current system does not lack focus. Uses part 3 as evidence of increased travel time. Thinks candidates would attempt less than whole exam equivalent. Recruiting more difficult. 2
- 24.
- Favors. Presents Canadian concerns; really doesn't say much else. Canadian concerns transcend our work for the most part. 3
- 25.
- Opposed. Loss of synthesis is major concern. 2
- 26.
- Opposed. Will sacrifice synthesis. Uses part 3 as travel time example.

- Most CAS exams don't provide natural partitions. Adverse impact on recruiting. 2
- 27.
- No strong feeling. Concerned about losing "advanced degree" image of ACAS and FCAS. 2
- 28.
- No opinion. Concern about travel time. Uses part 3 as example. 2
- 29.
- Opposed. Loss of synthesis is fatal flaw. Convinced that travel time will increase. Thinks there will be more stress, not less, under a partitioned system. 2
- 30.
- Opposed. Should remove obsolete and irrelevant readings from current

35.

Favors. Thinks students like partitioning. Partitioning would stabilize productivity of students near exam time. New subject matter could mean more exams rather than more severe exams. Partitioning would place more emphasis on learning than on passing. Synthesis would be hurt; suggests the possibility of a given reading on more than one partition. Favors more frequent testing. Thinks there will be a tendency to let partitions get bigger in terms of syllabus size.

3

36.

Opposed. Strongly favors current process; even suggests recombining part 3. Concern about travel time; part 3 example.

2

37.

Opposed. Favors current system with minimum standards. Travel time; part 3 example. Concerned about quality of

- FCAS. 2
- 38.
- Opposed. Current system achieves educational objectives. Concern about loss of synthesis. Travel time; part 3 example. More people will stop at ACAS. Concern about quality of FCAS. 3
- 39.
- Oppose. Travel time increase. Lost credits when syllabus changes. 1
- 40.
- No opinion. Indicates that partitioning unnecessary unless long-term goal is to have electives. 2
- 41.
- Opposed. CAS today has a significant recruiting advantage over SOA. Not convinced that FES/FEM is working for SOA. Wants to know how matter will be

decided. Will students vote?* 2

*No.

42.

Opposed. Favors for getting Canadian content in via nation specific parts. Recruiting is hampered. Synthesis is lost. Travel time; part 3 example. 2

43.

Favors. Important to offer exams more than twice a year, to benefit travel time and give students greater flexibility. Suggests eliminating essay questions to ease administrative burden. 2

44.

No opinion.* Travel time is an issue but he does not sense a level of unrest with life students. Administrative burden will be formidable. 2

*Probably favors, hard to tell.

45.

No opinion. Notes on copy of White
Paper pages.

1

46.

Opposed. Favors minimum standards.
Synthesis is very important. Travel
time will increase. Single partition
takers have advantage. Lowering passing
standards contrary to goal of improving
quality of education. Increased admini-
strative burden and cost. Employers
would need to restructure actuarial exam
programs. Recruiting is harder.

3

47.

Opposed. Travel time main concern.
Uses part 3 example. Those good at
synthesis and large volumes of material
would be losers. Questions fairness of
evaluations based on 12-15 questions.
FCAS graduate will be weakened.

2

48.

Opposed. Should evaluate all current weaknesses. Doesn't agree that procedural changes would be easier under a partitioned system. Concern about transitions. Travel time control is inconsistent with more focused exams. Thinks partitioned exam system would be more stressful.

2

49.

Opposed. Studying smaller units is diametrically opposed to producing well rounded, generalist actuaries. States current average time to FCAS is 8-10 years; must not be increased. Cites part 3 example. Makes recruiting difficult. Suggests vote.

2

50.

Opposed. Partitioning will produce technocrats vs. generalists. Gives naive mathematical travel time presenta-

tion. CAS work problems are fundamentally different from SOA, requiring synthesis.

2

51.

Opposed. Cites Fireman's Fund petition. Travel time. Competitive advantage of taking one part. Cites SOA part 3 results.

2

52.

Favors. Cites competitive issue on one vs. more than one part. This in turn leads to taking fewer parts and increased travel time. Relaxing standards. Lengthened travel time results in some who lose incentive to get FCAS because of attained job position.

53.

Opposed. If effort and travel time are unaffected, the same educational result should be obtained. Recruiting and company

programs adversely affected. Exam loads may be reduced to compete, thus increasing travel time despite all CAS efforts. 3

54.

Favors. Give more often. Some current exams have a hodgepodge of material. 2

55.

Oppose. Watch SOA longer. Use minimum standards. Quality of FCAS a concern. 2

56.

Opposes. Emphasizes need for synthesis. Comprehensive type exams good for professional designation. Minimum standards may be sufficient. Travel time could be significantly lengthened. Focus on weaknesses of current system would be better exercise. 2

57.

Favors, but insists on electives.

Thinks CAS must move toward specialists to avoid "jack of all trades, master of none". Very few synthesis questions on current exams.

3

58.

(Based on meeting with his students).

(Must read List too long to paraphrase)

3

59.

Favorable. SOA has done a poor job. Part 3 has increased travel time. Synthesis and time management skills are useful. Currently, more study time is needed for parts 4 and 5 than 1, 2 or 3. Work responsibilities cut into study time; partitioning lets one "chip away".

3

Task force should read.

60.

Oppose. Quality of education would suffer. Long-term retention would decrease. Travel time concern. His understanding is that this proposal is to enable consulting firms to get their students through.* Proposes alternative (probably unrealistic). 1

*Maybe someone should ask where this understanding came from.

61.

Opposed. Thinks partitioning is change for the sake of change. Criticizes most points in the White Paper. Suggests interviewing some life students. 2

62.

Opposed. Will drive candidates away from profession. Loss of synthesis is a concern. Questions better educational process. Exams can become too small. Would need to offer more frequently. Marginal candidates almost

certain to get through. Degrades the
FCAS designation. Employers' nightmare. 2

63.

Opposed. Will accelerate the increase
in syllabus material, number and length
of exams. Impossible to test everything. 2

Comments from students attached.

(task force should read) 3

64.

Opposed. Smaller units are worse
selectors; the luck factor increases a
lot. Prefers broad range of talent to
perseverance. Concern about travel time
in terms of employer investment. Cost
increase should get more attention.
Stronger syllabus is needed now. Parti-
tioning will result in weaker society. 2

65.

Opposed. Will lower quality of FCAS.

Travel time. He thinks SOA has been unsuccessful. Synthesis important. Smaller number of questions inadequate to test candidate. He says SOA members feel quality of education is lower and travel time is longer.*

*We should follow up on this.

66.

Favors. Main concern is travel time. Need incentive to have students take an appropriate load. Suggests an alternative which is roughly equivalent to imposing minimum standards.

2

67.

Opposed. Had experience with SOA exams. Felt shorter exams created time pressure unlike longer exams.

2

68.

Opposed. Must evaluate strengths and

weaknesses of current system. Employer concerns; time, expense. Career less attractive vs. accounting, e.g. ACAS may not pursue FCAS. Suggests membership vote.

2

69.

Opposed. Travel time will increase. Employer's investment will increase. Synthesis questions would not be used. Stress will increase. Exams more related to work is not valid.

70.

Opposed. Current structure is effective. Travel time. Partitioned exams may promote memorization rather than creative thinking. Prefers minimum standards. May be more appropriate for fellowship exams - less time available due to other commitments. Frequency of giving exams would need to increase.

3

71.

This is a petition not in favor.
Signed by a number of Fellows,

Associates and Students.

N/A

72.

Opposed. Major issue is travel time. Says Life actuaries have confirmed increase in travel time.* Not convinced that education can (or should) be improved. Raises several specific questions.

2

*Task force may want to follow up.

73.

Opposed. Travel time.

2

74.

Opposed. Travel time issue. Recruiting hampered. Fewer questions increases randomness.

2

75.

No opinion. What has SOA learned?
Concern about partitioned exams

becoming larger and larger. Doesn't see how syllabus changes are facilitated by partitioning. Concern about loss of synthesis. More frequent exams means constant studying. Place more emphasis on continuing education.

2

March 23, 1989

Partitioned Examination Task Force
c/o Casualty Actuarial Society
One Penn Plaza
250 West 34 Street
New York, NY 10119

Dear Sirs:

I favor the move to a flexible education system. The pros provided in the white paper far outweigh the cons cited.

I'm not certain that we should dismiss the possibility of eventually having specialty tracks. I did not find the evaluation provided persuasive in either direction. It would seem to me that "commonality of education" and a generalist orientation could be achieved by the time an individual has completed equivalent of seven or eight exams under today's syllabus. The ability to specialize via the last one or two exams might enhance our pool of future actuaries, rather than diminish it.

There is a lot to be said for transitioning from where we are to FES without electives. Once we've had experience under this system, we could then reevaluate whether or not it does represent our best approach to the future.

Thanks very much for the opportunity to provide this input. Let me know if I can be of further help to you.

Sincerely,

March 23, 1989

Partitioned Examination Task Force
c/o Casualty Actuarial Society
One Penn Plaza
250 West 34th Street
New York, NY 10119

Re: Flexible Examination System

Gentlemen:

I read with great interest the "White Paper" with regard to the Flexible Education System.

I am now 41 years old and have been an Associate of the Casualty Actuarial Society for 17 years. In part, I see my failure to complete my Fellowship as a lack of personal commitment. But I also see it as a matter of shifting priorities. By the time I was close to completing my Fellowship, choices had begun to arise between family responsibilities, work responsibilities and study for exams. In the end, study lost out. The irony is that the material on the exam I am missing is the material that I use everyday in my consulting practice. Unfortunately, there still is not time in my life to prepare adequately for Part 9 if taken as a whole.

I see FES as presenting the possibility of completing my Fellowship while reducing to some extent the strain from other forces competing for my time. For me, I see the choice as taking smaller steps or making no progress. I cannot find 400-500 hours to adequately prepare for all of Part 9. I could find 200 hours twice to take it in pieces.

Also, I don't believe that I am alone in this position. I think there are probably a number of long-time Associates in the CAS that have stopped at that level only because other commitments, many of them work-related, have left inadequate time to properly prepare for exams. These are not necessarily "marginal" students. I think that marginal people tend to get weeded out well before Associateship is reached. A case could be made that some of these people may be among our most talented - people whose work performance was sufficiently impressive that they were given exceptional responsibility very early in their careers. To the detriment of their examination performance.

Isn't the CAS better served by encouraging people to proceed in small steps toward Fellowship rather than getting to a point where they decide that no further progress is the best choice?

March 27, 1989

Appendix 6

Partitioned Examination Task Force
c/o Casualty Actuarial Society
One Penn Plaza
250 West 34th Street
New York, New York 10119

Dear Sirs:

I strongly oppose partitioning exams 4 through 10 into smaller units.

The major reason I oppose the change is that I believe that it would increase travel time to Fellowship, and thus discourage potential actuaries.

I think the current situation with Part 3 is a good example. In my company, many students choose to sit for only one or two parts of Part 3. Thus, at best it takes two sittings to pass all of Part 3. It frequently takes longer than that, and only the bravest student is willing to take Part 4 when he still has part of Part 3 remaining.

The White Paper suggests two ways to avoid an increase in travel time. I find both ways unsatisfactory. The first suggestion is to increase the pass ratio. Given students' risk-averse nature, we would have to increase pass ratios to unacceptably high levels to convince them to take more than two small exams at a time. Thus we would end up devaluing the worth of the exams.

The second suggestion is to increase the frequency of examination dates. This one is a better solution, but also has negatives. The biggest negative is the burden on the people who make up and grade the exams. In order to relieve this burden, I believe they would end up putting more and more multiple choice questions on the exams. This would result in lower quality exams.

-2-

Currently, the exam process is a long road, and a great deal of commitment is required in order to achieve Fellowship. Many capable people drop out of the actuarial program since they are not willing to make the commitment to the exam process. The proposed system will encourage even more people to leave the program.

If The CAS approves the smaller exams, we shall end up with fewer accredited actuaries. This will cause companies to use more non-accredited actuaries for actuarial tasks, thus there will be less commonality among people doing actuarial work. Also, The CAS's importance will shrink as the number of non-accredited actuaries increases.

I appreciate what The CAS is trying to do. However this would end up in weakening The CAS, and should not be implemented.

Very Truly Yours,

March 27, 1989

Appendix 6

Partitioned Examination Task Force
c/o Casualty Actuarial Society
One Penn Plaza
250 West 34th Street
New York, NY 10119

Dear Sir:

I read the very thoughtful and well written Task Force paper on the proposed FES and related matters. I compliment the Committee on developing an apparently comprehensive list of "pros" and "cons".

After thinking about the "pros" and "cons", I feel the "cons" totally overwhelm the "pros" and, therefore, I would argue against the proposal.

In my mind, the principal dispositive issues are:

- o As an employer, the prospects of increased (travel) times and costs (Appendix I-g.) are a clear "no-sale".
- o As an FCAS, I am very much opposed to any changes which might increase the likelihood of the ACAS being a more frequent terminal point (Appendix I-d.).
- o As a professional, I believe the prospect that having "more marginal performers able to pass with this system because of taking it in smaller pieces" (from Appendix II-b) is, in and of itself, a compelling reason to keep our current system.
- o As a businessman, I believe that the examination process requiring - as it currently does - time and project management, discipline, memory and synthesis skills - helps to develop well rounded managers and executives (Appendix I-c).

Partitioned Examination Task Force
March 27, 1989
Page Two

In sum, there may be lots of ways we can improve our educational process and our professionals, but in my view, FES isn't one of them.

Sincerely,

March 27, 1989

Partitioned Examination Task Force
c/o Casualty Actuarial Society
One Penn Plaza
250 W. 34th Street
New York, NY 10119

Dear Sir or Madam;

I would like to comment favorably on the proposed flexible examination system. I think splitting up unrelated topics will make some exams, Part 4 in particular, easier to deal with. I like the flexibility and time commitment decisions being left up to the student. While a student, I would have appreciated the option to trade a longer travel time for less personal sacrifice and time commitment per sitting.

As an employer, having the students take examinations in an order which relates to their work assignments should prove beneficial.

Regards,

March 27, 1989

Partitioned Examination Task Force
c/o Casualty Actuarial Society
One Penn Plaza
250 West 34 Street
New York, NY 10119

Dear Sirs:

The FES material mailed to members on March 14, 1989 reads as if the decision has in effect already been made to move to an FES system. The input being sought now from member and students appears to be not on the subject of IF FES but HOW FES. Am I interpreting the status of this properly?

Sincerely,

March 24, 1989

Appendix 6

Partitioned Examination Task Force
c/o Casualty Actuarial Society
One Penn Plaza
250 West 34th Street
New York, New York 10119

Re: FLEXIBLE EXAMINATION SYSTEM

Gentlemen:

Thank you for providing the opportunity to give input regarding the proposed Flexible Examination System under consideration by the CAS.

Personally, I do not endorse the direction as outlined, i.e., FES without electives and specialty tracks. It would seem to me that the primary benefit of a partitioned system would be to allow for tracks and elections. The other benefits are secondary, and of questionable value in comparison to the confusion and complexity that will follow this move.

I should also state that I do not support an FES with tracks. Our field is still sufficiently focused to allow for a generalist approach. This is one of the strengths of our current system, and is widely appreciated by employers and co-workers.

The current system encourages a synthesis of various subject matter when dealing with a particular problem. This is more than an educational nicety; it is a fact of everyday life for the practicing Casualty Actuary, and probably more so than for the other actuarial

disciplines. This approach is particularly valuable for the exams beyond Part 5. I would not want to see this aspect of our exam system sacrificed for the sake of topical "depth". If we go that way, I believe we will end up with people more technically knowledgeable in narrow areas, but less resourceful and innovative in coping with the manifold problems facing us today.

As an aside, I polled the students in my area, and they were unanimously opposed. They pointed out that this system will result in each student taking one subpart at a time, thereby lengthening the travel time to completion.

Finally, I would recommend that the Committee use every available forum to gather membership input. A general session discussion at the next CAS meeting might be useful, given the importance of this whole matter.

Sincerely,

441

March 31, 1989

Casualty Actuarial Society
One Penn Plaza
New York, New York 10119

Attention: Partitioned Examination Task Force

This is to respond to Kevin Ryan's March 14, 1989 mailing on Flexible Examination System (FES).

In brief my "vote" is nay.

As a member of the CAS, as well as being a member of the Syllabus Committee, I have been following with much interest the movement towards FES (and FEM) for the past several years awaiting a compelling argument for such change. Thus far I haven't found one.

To resurrect one of my favorite, overused, sayings: "If it ain't broke, don't fix it".

I am personally involved in the hiring of upwards of 15 or 20 entry level actuaries each year. I have yet to hear of a potential student volunteering that the SOA approach is better. From personal observation, I think we do have a problem in some cases attracting an MBA oriented graduate to the more arcane actuarial educational system. On the other hand, I believe the average competence of FCAS's in the insurance industry far surpasses that of MBA's. I would fault some FCAS for being not sufficiently aggressive or not sufficiently decisive as compared to some high caliber MBA's. Even so, I think the FCAS's know insurance much better than MBA's who work in insurance. As long as we keep the FCAS accessible and meaningful, I am not sure there is much more we can do to attract MBA's. It is not unreasonable that a person have both an FCAS and an MBA.

My point is that our current system works VERY WELL. While it may have weaknesses I don't see FES as an overall improvement.

To the extent the designers of FES see it as a tightening of educational standards, I am inclined to react that standards are already tight enough.

I am also quite concerned that we will be more likely to drive candidates away when we describe a series of 25 or 35 examinations.

While I haven't attempted to prove it, my perception is that the breaking apart of part 3 into courses 120, 130, 135 has increased "travel time" through part 3 at my company, which has many examination takers. This splitting of part 3 has not produced measurably better actuaries.

The one advantage I see to FES is that it will be easier to add or drop a subject from the syllabus. In the past, it has always been a very involved process with partial credits, partial exams and the like. Even so, some of this same problem will persist with limited carryovers of credits for discontinued parts.

Accommodating the needs of the CIA is useful if it does not totally rearrange how the CAS does things. I keep thinking of one man one vote and wondering if we shouldn't pay as much attention to states or state groups having populations equal to Canada's population.

Since with but one or two exceptions I disagree that the so called "pros" are in fact pros, I have very briefly annotated Appendix II in the pro column to provide you with more insight into my beliefs. I have not commented on Appendix I because it was not the recommended alternative. If some of my annotations are repetitious, so also are the pros.

To say it again: "If it ain't broke, don't fix it". FES is something we don't need. FEM is something else we don't need.

Sincerely,

April 5, 1989

Appendix 6

Partitioned Exam Task Force
CAS
One Penn Plaza
250 West 34th Street
New York, New York 10119

Dear Sirs:

I have read your recommendation for FES and wish to comment on several issues that the report raises. First, I agree with the decision to break down the exams. Among the three options I also agree that the FES without specialization is the superior alternative. I believe that this will allow more flexibility and less stress throughout the exam process.

I feel that the change will affect one's chances of achieving fellowship depending on their current status. One who is currently at the associate level, with increased job responsibilities and family demands, may not have the time necessary to prepare for a full exam. However, they may be able to prepare for a subset of those examinations. As you noted, this would also allow more marginal candidates to eventually receive fellowship in the CAS. Conversely, those who are in the early stages of the exam process may be discouraged if travel time increases significantly. Therefore, there may be a jump in fellowship early on, but a decline after an extended period of time.

I do not believe that travel time will remain the same as it is now. I cannot conceive of a system by which the students will be required to know the material in greater detail and, yet, get through in the same time. I do grant that higher pass ratios and more frequent exam offerings would help to alleviate this problem. However, more detail implies more time studying which, in turn, would lead to longer travel time.

The increase in exam offerings, combined with more numerous exams, may pose another problem which the report did not seem to address. Currently, the number of candidates sitting for upper level exams is very low. If the exams are split up, the number taking any exam could become even smaller. How would this affect the grading process on those exams? Certainly it could become difficult to observe any clear distribution in the results which would create problems in establishing a pass mark.

Thank you for allowing my input. As a student in the CAS, I certainly have a great interest in any changes which will be made. Because of the great impact which implementation of the report will have on students, I request that future correspondence be sent to students as well as fellows and associates. This is true for syllabus as well. Any changes in the syllabus affect students more than fellows, as they are no longer sitting for the exams.

Sincerely,

April 6, 1989

Partitioned Exam Task Force
c/o Casualty Actuarial Society
One Penn Plaza
250 West 34 Street,
New York, NY 10119
U.S.A.

Appendix 6

Dear Task Force,

Thank you for this opportunity to respond to your report. Please be clear that these comments are mine and mine alone. They do not reflect the opinion of the University nor the Canadian Institute of Actuaries.

I am pleased that you call yourself the "Partitioned Exam" Task Force and not the "Flexible Education" Task Force, since you exclude the possibility of a flexible education system, full blown. I believe that that may be a weakness in the long run. The reason I say this is Canadian based. I think you would be well advised to have some Nation-specific material. For example, Canada does not really have a private Workers Comp. industry, so many Canadians cringe at the level of W.C. material in the syllabus. At the same time, the C.I.A. wants to be sure that all new F.C.I.A.'s/F.C.A.S.'s have shown knowledge of relevant Canadian material. Can that be shown if at least 50% of the material on any exam is American? Finally the C.I.A. is requesting some "life" material for future F.C.I.A.'s/F.C.A.S.'s. Are you going to ask all future F.C.A.S.'s to meet this requirement or will the F.C.I.A.'s/F.C.A.S.'s have to sit an extra exam?

On the same point, at the University today, Course 140 (Society of Actuaries exam on Compound Interest) is the second exam our students sit. Having passed this exam very early on, they then feel a loss if they enter the C.A.S. system with no cross-credit. This may be a factor in discouraging our students (many) in becoming C.A.S. candidates. So let's allow for cross-credit for the Society of Actuaries Course 140 - please!! I am sure other campuses note the same effect.

. . 2

Appendix 6

Under disadvantages to Flex Ed., you list: " may be more difficult to assure real and perceived fairness and equity to all students because of different options." That has to be one of the most unactuarial statements I have ever seen. We are trained to be able to evaluate equity within and amongst different options. Are we admitting (and publicizing) our inability to do this most basic of actuarial practices?

Under administrative disadvantages you list cost. Yes, exam fees may rise, but the costs are fully supported within the exam fee structure, so is this a notable obstacle?

I do agree with your advantages (same page - Appendix I-e); namely:

2. Facilitates more joint sponsorship of exams with S of A (a laudable goal)

4. FES makes it easier to deal with CIA objectives (is this not essential?)

In general, I appreciate the hard work done to produce this document and feel that it is a step in the right direction.

While some of my comments are slightly off topic, I hope they will assist you in your further discussion.

Yours most sincerely,

Appendix 6

April 24, 1989

Casualty Actuarial Society
One Penn Plaza
250 West 34th Street
New York, NY 10119

Re: Splitting the Upper Level Exams

Dear Secretary:

I am in favor of splitting the CAS exams, albeit with some reservations. The following considerations seemed the most important to me:

1. The students I polled generally liked the idea.
2. If after 2-5 years it turns out to have been a mistake, then the old system can be reinstated fairly easily.
3. Each of the current exams, in my opinion, is roughly equivalent to two graduate-level, self-study courses in which the grade depends solely on an "in-class" final exam. Few, if any, serious programs of graduate study operate this way. There is usually a test or project for each major section.
4. As exam time nears, students become progressively less productive at work. Split exams could alleviate this "productivity variance."
5. Over time, new subjects have been added to the exams much faster than old subjects have been dropped. With split exams, new subjects would probably result in more exams rather than more severe exams.
6. There is no reason why optional, longer exams could not be added to a split-exam syllabus to qualify people as specialists in certain areas. The current syllabus properly concentrates on a generalist education. The typical company actuary is becoming more of a specialist as the years go on, in my opinion. In-depth education in specialty areas can be accommodated under a split or non-split system for the core exams.

7. Split exams will make it easier for the student to match up his work-related educational needs with his off-hours educational activities. A need or interest in, say, reinsurance pricing may not coincide with any work projects involving time series models. A split exam system could lead to more emphasis on the learning, less on the passing.

My reservations are these:

1. Students sometimes look at exams as hoops you jump through for a reward. Once you jump through a hoop, you forget it and run to the next hoop. Split exams might reinforce the propensity to study strictly for the sake of passing.
2. The sections of one exam tend to inter-relate. They explain and clarify each other. Split exams might obscure this or destroy its value to the student. There is no reason, however, why a particular exam article cannot be required for two or three exams.
3. The "productivity variance" problem will probably stay with us, if syllabus subjects continue to be tested at annual intervals. Split exams simply increase the pressure on somebody who wants to reach Fellowship before the age of forty. (O.K., then, thirty.) The student will attempt to pass more exams each sitting, in order to get through the same volume of material in the same span of time. Consequently, I would like to see more frequent testing of syllabus topics under a split exam system. I wonder how the CAS can pull this off.
4. There will be a real temptation to let the smaller, split exams get bigger over time. How can you exclude that important new article? It's not such a long syllabus list, really... And it's only one little, additional article... And it is important...

Sincerely,

May 16, 1989

Appendix 6

Partitioned Examination Task Force
c/o Casualty Actuarial Society
One Penn Plaza
250 West 34th Street
New York, NY 10119

Dear Colleagues:

After reviewing the pros and cons of the partitioned education system carefully, I have come to the conclusion that we probably ought not to change our testing methods at this time. The potential gains appear limited, there is some risk of making things worse, and the amount of work to change the system is quite heavy.

My concerns about switching to PES are:

- 1) Two major changes that the Society of Actuaries expects partitioned exams to facilitate are having alternative exam tracks and giving credit for college courses (FEM). In contrast, the Casualty Actuarial Society has chosen against these routes.
- 2) Ultimately, what the student learns depends upon preparation effort. A goal of PES is to leave travel time unaffected. Therefore, we would be aiming for the same amount of effort by the student. I would expect approximately the same educational result.
- 3) The split into partitioned exams may cause unexpected difficulties with recruitment, company promotion and raise practices, or examination committee staffing.
- 4) Ultimately, the travel time could be affected despite our best efforts. Students may become accustomed to taking what amounts to a fraction of a current examination. Other students may have to reduce their exam load in order to compete with those who specialize and take the exams in small units.

-2-

- 5) The widespread opposition to PES expressed by the membership might make conversion more difficult.

In the long run, I have no doubt that the CAS has the ability to switch to partitioned examinations. One way or another, all the problems that come up can be solved. However, the amount of effort to cope with all the different problems in subdividing the examinations may not produce enough benefit to justify the effort.

Sincerely,

May 19, 1989

Partitioned Examination Task Force
c/o Casualty Actuarial Society
One Penn Plaza
210 West 34 Street
New York, NY 10119

As an exam coordinator, part of my responsibilities include motivating students to pass exams, facilitating exam success through the student program policy and monitoring exam results.

When the CAS asked for comments on the FES I decided to meet with our students to see how they felt about the potential change in exam structure.

Naturally, my response as student coordinator would be incomplete without the current perception of the attitude of our students.

The next two pages present the major discussion points and findings from our meeting.

Appendix 6

OPINIONS ON THE FLEXIBLE EXAM SYSTEM

The Casualty Actuarial students at Insurance Companies had an opportunity to get together to discuss the March 14, 1989 white paper concerning the Flexible Examination System. Although we understand that each student will have an opportunity to express their view, we thought that our overall perception might be presented in this format (in no way do we wish to preclude our students right to participate in your future opinion gathering!).

On the positive side we found:

- 1) May make it easier for an ACAS to get to FCAS.
- 2) If the workload is unusually heavy, the student can adapt their studying to the exams.
- 3) People can obtain credit for part of an exam instead of getting no credit.
- 4) For those students not currently in the Actuarial program, it would be easier to get some credits.
- 5) Focus on pieces that relate to the current work environment.

On the negative side of this issue were:

- 1) Our Life Student Coordinators think it takes longer and is harder to pass the exams. What statistics can CAS supply about Part 3 before and after the switch into parts?
- 2) There is a strong belief that travel time will, in fact, be extended. How will travel time be monitored so as to not "substantially increase" it?
- 3) Where will we find enough people to fill out the exam committees? If the exams are more focused, who will make up the creative questions to differentiate among students? Who will grade the answers? Will the existence of more exams mean more (or all) multiple choice questions?
- 4) While the Unification Issue is supposed to be ignored, some students believe that issue is why the FES is being discussed in the first place. If so, why isn't the life side going back to the ten exams format?
- 5) When all is said and done, what do we gain? The thought among most individuals is that an FCAS knows quite a lot of information and that this new procedure doesn't add to that.

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As you have most likely noted, most of the negatives are in question form. Other unanswered questions include:

- 1) Will the pass ratio stay the same, go up or go down? How will this affect the quality? Will passing be based on demonstrating a command of the subject matter, irrespective of the resulting pass ratio?
- 2) How often will exams be given? Quarterly? What exams?
- 3) How will the various parts be broken? Will all exams be converted simultaneously? What will be the impact on the overall size of the syllabus?
- 4) Will one have to become an ACAS (whatever that will mean) to certify loss reserves, or will passing the loss reserving section(s) be enough?

Concerning the survey of students that CAS wants to do, we have the following thoughts:

- 1) Do not send out these surveys when students are expecting exam results. In the past, several mailings have come to students who were awaiting their results. The usual reaction to these mailings has been negative and such a mailing would, most likely, yield a bias.
- 2) Do not try to get opinions immediately before or after exams are given. Students do not want to think about such an important topic as FES nearby their exams.

There is a concern among some individuals that FES is already in concrete and that it doesn't really matter what is written or said by those in opposition to this concept. It would be helpful if CAS would publish the results of the surveys (members and students).

We had a show of hands at the end of our session regarding the implementation of FES:

2	For
10	Undecided
20	Against

As an exam coordinator, I am concerned about the unanswered questions. Multiple exam dates may or may not be a problem—depending on their frequency - for administration purposes (not to mention record-keeping). I am also worried about transition if we do go to FES.

I believe the main concern that I have (and others share this) is what do we get out of going to FES?

Appendix 6

Partitioned Examination Task Force
c/o Casualty Actuarial Society
One Penn Plaza
250 West 34 Street
New York, NY 10119

To: CAS Board and the Education Policy Committee

Re: Flexible Education System

As a CAS student working for _____ Insurance Company and as the Vice President of Education for a local _____ Actuarial Society, I would like to provide you with my comments regarding the White Paper on the Flexible Education System (FES). (I have also studied the pros and cons provided to members of the Casualty Society.) Overall, I am in favor of the idea of FES program, but careful construction of this system and a thorough review of membership input are crucial to the success of FES! I personally feel that the Society of Actuaries has done a poor job of implementing their FES and ignored many of the membership's comments, much less the students' comments. The Casualty Society could probably learn from the SOA's blunders and, it is my fevered hope, avoid them with their own development of FES!!

I took Part 3 the first time it was split into 3 separate "courses", 120, 130, and 135. I was fortunate to pass all three sections at once, but I thought it was ludicrous to test my knowledge of Numerical Analysis material with only ten questions. Travel time has increased for many of our students who took or are taking the SOA Part 3 "courses" under the new system. Most of the students at _____ do not pass all three sections at once, particularly since it is too tempting to study for only one or two sections. And I do think it is useful for a student to learn the time management and synthesis skills necessary to pass an actuarial exam.

However, my above reflections do not mean that I am not in favor of the partitioning of exams. I am in favor of it! As a student who has been struggling with Part 4 and Part 5 for the last two years, I can see a real cause for splitting up these exams, particularly now that minimum standards are imposed on Part 4. (Granted, a somewhat self-centered cause, but valid nonetheless.) There appears to be a greater amount of material (and it is not generally taught at any universities) on these exams than on the lower level exams. Students always seem to need to increase their total study time to pass CAS exams over Parts 1-3. I would recommend splitting Part 4 into two subparts (four parts or three parts would be ridiculous!), Life Contingencies and Interest, and Credibility and Loss Distributions. Part 5 could be split into

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Economics and Risk Theory as one subpart and Policy Forms and Insurance Operations as the other. Do you have any idea how frustrating it can be to study diligently for 4 months and come out with nothing to show for it? At least this way students could "chip away" at the exams and at least come out with "something", a piece of the current exam, if not all of the exam. My responsibilities at work have, needless to say, increased substantially since I was a Parts 1-3 student, and it is more difficult to find those study hours essential for passing the exams. But I would stand a much better chance of being able to knock down a subpart than all of the exam sections at once. Our ("our" meaning ") pass ratios on Parts 4 and 5 have been relatively poor as well. This is where most of our students, myself included, get "hung up". I do not think it was necessary for the SOA to split their exams into as many subparts as they have, but I do think Parts 4 and 5 are well-suited for partitioning and would not increase travel time substantially, if at all. (Has anyone at the CAS conducted surveys to find out how many students sitting for Parts 4 and 5 are first-time takers, second-time takers, third-time takers, etc.? Only on rare occasions have I seen a student pass Part 4 on the first try.) As for Parts 6 through 10, I really do not know enough about these exams to tell you whether they would be well-suited for partitioning.

The SOA recently has offered an Applied Statistics intensive seminar for elective credit. However, the enrollment is limited, and many companies and consulting firms were not informed of this seminar in advance. I feel it is discriminatory to limit enrollment and to require that participants have passed course 120 in the last two sittings. EVERY student should have an equal chance to earn credits towards Associateship or Fellowship level. Certainly, restricting enrollment of a seminar and only making one seminar available (located in the Midwest and nowhere else), does not provide this! Besides, what is the criteria for "passing" these seminars? The big advantage of using exams to test for knowledge of syllabus material is that is a very objective and fair way of deciding who knows the material well enough to get credit for it. At least it is when compared to other methods, such as intensive seminars and college classes, etc.

Frankly, I do not feel that FES will significantly increase the quality of education. And it will increase the number of administration problems for both companies and the CAS, I am sure. However, it may allow people to specialize in the areas most applicable to their work, if elective exams were offered anyway. I am disappointed that the committee felt that the "FES system with electives was not considered as a viable alternative at this time." I concur with the committee's opinion that Actuaries should get the same broad-based background in mathematics, economics, ratemaking, and accounting, etc., but at the Fellowship level I feel that it may be more beneficial to offer more specialized elective subjects. (Maybe topics such as Econometrics as it applies to commercial insurance ratemaking?) Of course, it probably would be more difficult to find qualified CAS volunteers to grade these exams. Perhaps papers should be allowed as elective options for Fellowship credit on specialized topics.

I recommend that FES be adopted for Parts 4 and 5 as I have prescribed above. As for other considered changes, I do not have specific recommendations other than I implore you to consider these changes very

carefully and review the flaws already seen, in my opinion, with the SOA's Flexible Education System.

Sincerely,

May 23, 1989

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Partitioned Examination Task Force
c/o Casualty Actuarial Society
One Penn Plaza
250 West 34 Street
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To: Task Force Members

Re: Flexible Examination System

Kevin Ryan, in his March 14 letter to the CAS membership, asked that comments and opinions on this proposal be directed to the Task Force.

My reaction to the proposed plan is a negative one. I don't believe the change is necessary or desirable. In recent years, the amount of syllabus material, as well as the number of exams and their length, have been increased significantly. This proposal will simply accelerate that process. Despite your Task Force's intention - and that of the Board's - in my judgment, that outcome is inevitable.

And to what avail? Certainly, the syllabus material and exams need to be kept up-to-date. But it is also impossible to test on everything. New ideas and tools are generally founded on older ones. As this new knowledge comes along, is it necessary to continue to test the old? (A case in point: Is the Part 1 exam still needed?) True, this new knowledge tends to increase exponentially; but increasing the study material and time proportionately is not the answer.

Reactionary that I am, I'd probably prefer to go back to the eight 3 hour exam set up. No doubt that's unrealistic. But I do think we could do a better job within the present framework - both in terms of present and future needs - by developing syllabus materials and exams which emphasize concepts and general approaches rather than specifics and technical minutiae.

So, let's stay with the present plan, and try to improve upon it.

For whatever they may be worth, attached are some comments from several of our students (past and present).

Thank you for your attention.

Sincerely,

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COMMENTS FROM STUDENTS RE PROPOSED FLEXIBLE EXAMINATION SYSTEM:

1. I see a more complicated, harder to administer system that will produce little if any benefit. In the long run, I think this would make the exam process even more difficult than it already is. Exams will be harder and will invariably end up covering a lot more material than it does now. I am not in favor of this change.
2. My initial reaction to this system is favorable. I think that shorter, more numerous exams will tend to promote greater learning and understanding of the material. With the large amount of material to know for the current exams, I feel it's easy to just memorize what you know will be on the exam for sure, without totally understanding some of the concepts. With so much material to cover, you must learn it fast and move on. To some extent, I think the new system would reduce this problem.

The cons listed on Appendix I-d I think are valid concerns. Exams would probably be tougher, and those students taking an entire exam (e.g. 4 parts) would probably be at a disadvantage to those taking just one or two parts. The CAS has control over the former, but probably not the latter.

One final concern I have is cost. The white paper indicates that administrative costs would likely increase under FES. I feel the exams are already too expensive. I would hope that the CAS would do everything possible to efficiently administer the exams and keep costs reasonable.

Overall, it sounds like a good change.

3. Here are my comments about the new flexible exam structure (FES). If FES goes in as presented in theory, then I'm neutral. However, I have the following fears:
 - Will each subpart increase in difficulty year after year such that the study time per "whole exam" will increase? If so, then it seems travel time will increase.
 - Will students taking several parts be at a disadvantage against those who specialize on one at a time? If so, then it seems all will start to specialize and travel time will increase.

Concerning the goals, is education really that high of a priority? Obviously, I haven't taken but half the exams so maybe the higher exams do help for our job here. But so far, the exams appear to be mostly a filtering process.

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COMMENTS FROM STUDENTS RE PROPOSED FLEXIBLE EXAMINATION SYSTEM:

4. My main concern is travel time to fellowship. I can't believe that this won't increase your time to obtain fellowship. I also believe the person who wants to pass all of say Part 5 will likely be at a disadvantage with the student who's only taking the first part. If I thought they were going to segment the exam and be more standardized in the questions they asked, I'd probably say OK. If they offer the exams three times a year versus two, how soon will we get the results? A week before registration is due for the next exam? Will they really segment the exams and not add more material?

Bottom line is they want to control supply - and the exams are already doing a good job of that.

5. The first few years under the FES would probably work as expected. The exams would be more focused and students would gain a better understanding of each topic. But, eventually the original intent would be lost, and there would become 20 exams that take 20 years to pass. The difficulty and length of each exam would gradually increase and the percent of students passing each exam would again become 25-30%. This will not make it easier to get through the exams. I am definitely opposed to this!

6. I am against splitting the current exam system into the FES. The following are my concerns:

- 1) The travel time would be increased.
- 2) Splitting the exams and adding material without deleting any material would add to study time.
- 3) I do not like the possibility (ultimately) of 20 four hour exams.
- 4) Specialization of material could make it harder to pass exams. (Part 4 in the past was taken with life actuaries). For example, reserve material, by itself, taken with actuaries who work on reserves only.
- 5) Five to ten questions on an exam would not be a good representation of ability to understand the material. This would have a tendency to push exam scores closer together.

passing difficulty more variable from one exam to another.

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COMMENTS FROM STUDENTS RE PROPOSED FLEXIBLE EXAMINATION SYSTEM:

7. This concept can only increase the amount of time that will be required to prepare for each exam; and, more than likely, the amount of time required to pass the exams.

The FES adds a requirement of minimum proficiency in each piece of an exam. This is a greater requirement than at present. In addition, fracturing the exams into pieces will foster more specialization to "pass" each part. Consider Part 7 - if the exam is split into a Reserving Exam and an Annual Statement Exam, we will have to compete separately against actuaries who do reserving as their function and against actuaries who put together the annual statement. This will be much tougher than competing against the same actuaries on both pieces combined. Thus, because of actuarial specialization, the knowledge necessary to pass individual pieces of an exam will increase. Needless to say, the actuary who takes both parts of the Part 7 exam will need to know considerably more detail to pass the exam than is necessary now.

The greatest danger in the FES program is what happens in the future. As the pieces become more competitive, the exams will need to be expanded in scope, detail, or length. Each piece will become an exam requiring sufficient study to preclude adequate preparation for another piece. Isn't this breaking up of exams the way new exams are born?

If the CAS wants to improve the education of the actuary, this will do it. The cost will be greater travel time, regardless of what the committee may say. Let's be honest, CAS, this new program will make it tougher to pass each exam and require more time to do it.

8. If administered well, it appears that the pros and cons were fairly well itemized.

There appears to be recognition expressed in the White Paper that, generally, more "study time" will be required of the student - this even under the premise that the exams are not made more "difficult" as they become more focused. That would seem to necessarily translate into more "travel time". I'm possibly influenced somewhat by my personal standing, but I don't see that the pros presented outweigh the cons.

Additionally, two general areas are not being given proper consideration, in my opinion. The two are, admittedly, related.

COMMENTS FROM STUDENTS RE PROPOSED FLEXIBLE EXAMINATION SYSTEM:

- (Cont'd) 8. (A) SPECIALIZATION - even if those persons administering the exams in the future understand and implement the intentions underlying the current thinking and the change to FES, the FES approach must lead to specialization. Each part (subpart) is destined to eventually have some people (students) who are concentrating heavily on that part (only). Given the competition and minimum standards, that must lead to a similar type of competition as we have now, but for 20-30 exams (subparts) instead of ten. The white paper does not leave me to believe that this is anyone's intention, although perhaps it is.
- (B) Each exam (subpart) would become 15-20 questions and be tested for 60-90 minutes. Professional educators will tell you (and it should come as no surprise to any of us) that the fewer areas that are explored on an exam, the more random the results can become. They don't say it that way, but what they mean, e.g. is that in giving a final exam, if you ask 100 questions and test for 5 hours, you will do a better job of ranking students than if you ask 10 questions and test for 30 minutes. At the extreme, if you ask only one true/false question, the "best" student might happen to miss that topic, or he/she might punch a # on the calculator wrong, and come up with the wrong answer and a FALLING grade. The "worst" student might get lucky and you might hit the one area he/she knows.

On balance, I cannot possibly imagine that the subdivision into parts could be a good thing.

9. I just have one main question about all of this: Is the CAS more concerned about the quality of background of the on-board Fellows or the Fellows-in-process? If the concern is only about those in process, perhaps the splitting of exams makes some sense in theory. In actual practice, however, a battery of tests makes more sense since a synthesis is what is required on the job. Perhaps one battery for associate, and a second for Fellow.

If, on the other hand, the concern is for on-board Fellows, continuing education in some form is the answer. The true scholar constantly upgrades his/her knowledge. Others who consider the exam process a means to an end will probably not upgrade themselves. With time, they become out of date. To my mind, continuing education ought to be considered. Realistically, though, the continuing education concept won't catch on because the on-board Fellows as a whole would never agree to it.

All things considered, people who finish the exam series today have a more broad knowledge of the actuarial profession than those who finished 25 years ago. To split the exams into smaller parts has the potential to achieve greater knowledge in more areas, but it is questionable if the finished product would be any better at synthesizing information than finishers of the current exam series. I think attention ought to be directed to making the current exams more valid and standardized, and to establishing a meaningful continuing education policy.