CASUALTY ACTUARIAL SOCIETY
EDUCATION POLICY COMMITTEE

2008 TRAVEL TIME REPORT

ANNUAL REPORT TO THE BOARD OF DIRECTORS ON TRAVEL TIME STATISTICS FOR CANDIDATES OF THE CASUALTY ACTUARIAL SOCIETY

March 2009

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The 2008 Travel Time Report (2008 Report) provides insights and observations based on travel time statistics compiled using the membership database of the Casualty Actuarial Society (CAS). In April 2008, the CAS implemented new database software, which resulted in significant data scrubbing to improve the quality of the data prior to conversion. As a result, the statistics produced from some of the data underlying the 2008 Report are not fully comparable to the statistics in prior years' reports. The CAS continues to investigate the data anomalies that may have occurred due to the conversion. The most significant data issues affecting the 2008 Report are described in the *Data and Data Organization* section and in Appendix C to this report.

We continue to compile data based on date from first examination (exam); this approach was first introduced for the 2007 Travel Time Report (2007 Report). This allows us to make use of a much larger data set, especially for candidates. We estimate travel time from date of first property and casualty (P&C) actuarial employment by subtracting the median time from first exam to first employment. We have removed many of the tables and charts that depict travel time from first employment from the body of the report; however, they are all included in Appendix B for completeness and comparison to prior travel time reports.

The compilation and interpretation of CAS membership travel time statistics continues to be challenging. Since no single metric can fully convey all aspects of interest regarding travel time, we consider several different measures of exam progress in this report. From our analysis of these metrics, we observe that:

- **Travel time to Fellowship is well above the Board of Directors' goal of five to seven years.** For the most recent years, we project median travel time from date of first employment to Fellowship to be between 8.0 and 8.5 years. The projected median travel time (from first employment) is quite consistent for the last twenty years (i.e., 1990 to 2008).The travel time is down by approximately one year from the level observed in the 1980s.

- **Projected travel time from first employment to Associateship for more recent years is lower than levels in the mid-1970s through the 1980s.** It is interesting to note that different trends are apparent based on travel time from first exam and travel time from first employment. From first exam, the travel time to Associateship decreased in the most recent years (i.e., 2005 to 2008) to approximately six years from the values of 7.25 to 7.50 years seen during the 1985 to 2004 period. From first employment, the years with the greatest travel time are 1975 through 1989. We note that there was an increase in Associateship exam requirements in the mid 1970s and an effective increase in 2000.

- **Travel time between first exam and first employment is decreasing.** The median time from first exam to first employment, which increased from the 1970s through the early 1990s (to a high of 2.0 years for the 1990 to 1994 period) now appears to be decreasing. While the data is more limited with respect to date of first employment than date of first exam, the selected values for years 1999 and prior are based on the actual data of more than 4,000 members. We select the values of 1.13 year for the period 2000 to 2004 and 1.00 year for the period 2005 to 2008. In future reports, we will investigate the

reasons for the significant changes in the time between first exam and first P&C employment which may result from demographic changes, unemployment rates at the time, or other causes.

- **The number of CAS candidates entering the profession was at its highest in 2005 and 2006 and has declined each subsequent year.** From 2000 to 2005 the number of candidates writing the jointly administered exams and the number of new CAS candidates increased dramatically. Since 2005, however, there has been a noticeable decline in the number of CAS candidates. We will investigate this in future reports.

- **Significant numbers of candidates drop out of the process before becoming members of the CAS.** Candidates who registered but never passed an exam comprise approximately 20% of the population. For those who pass at least one exam, approximately 40% are expected to achieve Associateship, and 35% will reach Fellowship.

- **The average age of the candidates is increasing.** While the trend has levelled off, the average age of candidates sitting their first exam has increased from 23 in 1990 to approximately 26 in more recent years. We observe that candidates who enter the profession in their early 30s tend to have shorter travel times than those who enter the profession in their 20s.

- **There have been significant changes in the exam system since 1990.** We recognize that these changes disrupt the flow of candidates through the system and affect the supply of candidates to employers. (See *Pass Ratios and Progress Statistics* section in Analysis and Results).

ANALYSIS AND RESULTS

The CAS basic education exam system has undergone significant changes since 1990, all with the intent to improve the quality of the exam process. Travel time statistics are among a number of measures that are used to identify and monitor any effects these changes may have had on the organization's admission rates. The 2008 Report provides insights and observations based on travel time statistics compiled using the CAS membership database.

"Travel time" is a term commonly used by the CAS to denote the number of years it takes a candidate to achieve membership (either Associateship or Fellowship). In 2002, the CAS Board of Directors adopted a revised definition of travel time to denote the time between the first date of full-time P&C actuarial employment and attainment of either the Associateship (ACAS) or Fellowship (FCAS) designations.

APPROACH AND METHODOLOGY

In the 2008 Report, we focus on an analysis of travel time from date of first exam. To be consistent with the Board's revised definition of travel time, we adjust the travel times from first exam by an estimate of the time between first exam and first employment to produce projected travel times since first

employment. This approach was introduced in the 2007 Report and can be expanded over time to replace many of the statistics from prior years' reports on travel time.

In our analysis, we construct development triangles showing the count of CAS candidates, ACAS members, and FCAS members by elapsed time from the date of first exam.

We use the CAS candidate count information as a proxy for exposures. As most preliminary exams are jointly administered by the SOA and CAS, many candidates (especially those still in university) may not be known by the CAS until they register for a CAS-specific exam or report to the CAS that they have decided to follow the CAS track. For this reason, we also review development statistics for the count of CAS candidates, and project these to ultimate by year of first exam using a chain ladder approach. This concept is similar to developing underwriting year premiums to ultimate before using them as an exposure base as is commonly done with treaty reinsurance reserving. We are only able to create two diagonals of information for the CAS candidate count triangle due to data inconsistencies which arose as part of the database software conversion. (See further details in the *Data and Data Organization* section below.) Thus, the CAS candidate count development pattern is subject to significant uncertainty.

Traditional actuarial projection methods are applied to estimate ultimate membership counts for cohorts grouped by year of first exam. We use the Bornhuetter-Ferguson approach to complete the triangles. Median travel times from date of first exam for each of the ACAS and FCAS membership classes are then estimated from the completed triangles. Finally, we calculate the travel time from date of first employment by subtracting an estimate of the time from date of first exam to date of first employment.

We include further details regarding the methodology and key assumptions in Appendix A to this report.

For continuity as well as to gain additional insight, we have updated all of the statistics from the 2007 Report to include results through the May 2008 exam sessions. These additional statistics along with supporting discussions are contained in Appendix B to this report, which includes the following:

- Median travel times for starting cohorts;
- Percentage completion for starting cohorts; and
- Travel times by candidate age.

DATA AND DATA ORGANIZATION

The information underlying the 2008 Report excludes a number of candidates who were included in the 2007 database and thus the 2007 Report. These exclusions are related to the additional efforts to scrub the data for illogical entries, inactivity, and duplicate records prior to conversion to the new database software, which was implemented in April 2008. In some cases, candidates were unintentionally excluded from the database extraction. We understand that this was caused by a change in vendors and a rewriting of the extraction code that occurred as part of the conversion process. The following are excluded from the 2008 database:

- Candidates who registered for one or more exams in the past but had not passed an exam to date (there are approximately 3,000 records that were unintentionally excluded from the database extraction);
- Individuals who achieved Fellowship via mutual recognition (18 Fellows);
- Inactive candidates, many of whom are not CAS candidates (for example, those who would have registered for CAS Exam 4B under the pre-2000 syllabus either to satisfy FCIA requirements or for SOA credits but have not registered for any other CAS exams since); and
- Any duplicate records that may have existed in the 2007 database (mostly CAS candidates).

We also made a number of manual corrections to the data for illogical entries. We communicated and confirmed these corrections with the CAS to ensure that the source data would be corrected as well. For the unintentional exclusions, time and resource constraints did not allow us to manually include the 3,000 CAS candidate records that were dropped. We were, however, able to adjust the 2007 Report information to make the CAS candidate counts comparable to the 2008 Report data so as to make the calendar year development for CAS candidate counts meaningful. The historical membership database is archived, and we understand that the CAS continues to work with the vendor to resolve the data issues that were identified in producing the 2008 Report.

It is critical that anyone analyzing statistics contained in this report understand the limitations in the data set. In addition to the data inconsistencies previously described, we note the following limitations:

- The CAS databases do not contain a complete exam history for every candidate. The databases were constructed in the late 1980s. Although an effort was undertaken at that time to locate as many exam results as possible, complete histories were not available for some candidates.
- Prior to 2000, results for joint exams were often entered with an exam date of 1900/01.
- Prior to 2000, failed attempts on joint exams were frequently not entered into the database.
- Exam waivers are frequently coded with the date on which the waiver was approved rather than a May or November date.
- Dates coded for achievement of ACAS and FCAS are recorded as the date of the meeting during which the member was formally recognized. This date is generally six months after the exam sitting.

Further details regarding the compilation of the data underlying the 2008 Report are contained in Appendix C to this report.

To implement the revised definition of travel time (i.e., from the date of first P&C employment), the CAS needed to collect date of first P&C actuarial employment information from its members and candidates. Dates of first employment are now routinely collected by the CAS for all candidates registering for CAS exams. There is also an ongoing attempt to collect first employment date for all current members. Despite these efforts, however, dates of first employment are still not present for most active candidates, for many candidates who left the process without achieving a designation, and for a significant number of members. Table 1 compares the number of candidates and members for whom we have first employment dates and first exam dates. (The data is as of September 2008.)

Table 1

Percentage of Candidate/Member Population with Employment or Examination Dates in Database					
Membership Category	Total Population	Number With First Employment Dates	% of Individuals with First Employment Dates Coded	Number With First Examination Dates	% of Individuals with First Examination Dates Coded
ACAS	1,533	1,263	82%	1,292	84%
FCAS	3,174	2,828	89%	2,865	90%
Candidate	14,453	2,071	14%	13,234	92%
TOTAL	19,160	6,162	32%	17,391	91%

As evident in Table 1, the percentage of the database population with dates of first employment recorded (32%) is significantly lower than the percentage of the population with dates of first exam recorded (91%). The proportions with first employment date are greater than the adjusted 2007 value[1] of 28%. While we have first employment dates for close to 90% of Fellows and more than 80% of Associates, we are still missing first employment dates for more than 85% of CAS candidates.

For both the 2007 and 2008 Reports, we organize the data by date of first exam as we have this information recorded for over 90% of the population. This contrasts with less than one-third of the population having dates of first employment coded. An additional reason for using date of first exam is that the date of first employment is reported late, and as a result, statistics organized by date of first employment will change over time, possibly producing a significant affect on the conclusions regarding travel time. We recognize that the data organized by date of first exam will also change from year to year; however, we expect these changes to be less frequent and less significant than the changes to date of first employment. Thus, we believe that an analysis based on date of first exam will produce findings with a greater degree of stability and accuracy than an analysis based on date of first employment.

The ACAS and FCAS triangle data compiled for our analysis differs, somewhat significantly in certain years, from the triangles compiled for the 2007 Report. In compiling the data for the 2007 Report, an attempt was made to assign a first exam date to the ten percent of the population where this information was missing. Based on the information available at the time of the 2008 Report, it is our view that the prior adjustments may have introduced a bias in the estimates (i.e., the interior of the prior triangles may have been affected). When comparing the projected numbers of Fellows and Associates in the 2008 Report to the projections from the 2007 Report, we observe lower numbers in the older years due to the exclusion of members with missing first exam dates in the latest analysis.

[1] Percentages adjusted from 2007 Report to exclude approximately 3,000 candidates who had not yet passed an exam, who were included in the 2007 Report's candidate population.

The selected ACAS, FCAS, and CAS candidate count development patterns from the 2007 Report are shown in the exhibits (included as Appendix A to this report) for informational purposes only. Due to the differences in underlying data and our understanding of the improved quality of the current data, we assign minimal, if any, weight to the prior patterns when selecting the development patterns for the 2008 Report.

RESULTS AND OBSERVATIONS

PROJECTED TRAVEL TIME: ACAS AND FCAS

For each Associate and Fellow with recorded first exam dates, we calculate travel time from date of first exam as the difference between the date of the CAS meeting where the credential was recognized and the date of the member's first exam. We estimate projected travel time from date of first employment using projected travel times from date of first exam and selected lag from date of first exam to date of first employment. The distribution of travel time from date of first employment (with results rounded to the nearest year) and the projected travel time distribution for future members are displayed below in Charts 1 and 2 for Associates and Fellows, respectively.

In both histograms, the furthest most left bar represents the number of members who achieved their designations in less than one-half year after starting their first full time P&C actuarial job (including those who achieved their designations before beginning full time employment). The second bar represents members achieving their designations more than one-half year but less than one and one-half years after starting work. Both populations are skewed with heavy right tails.

Chart 1

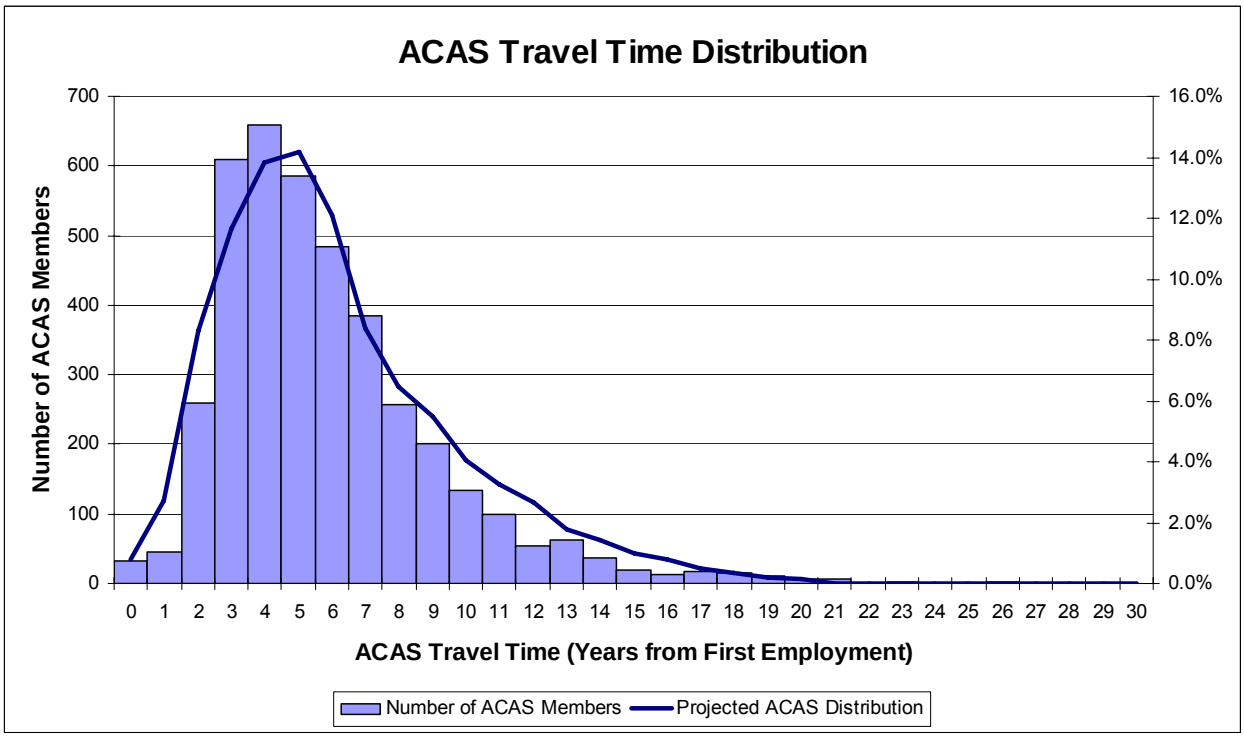
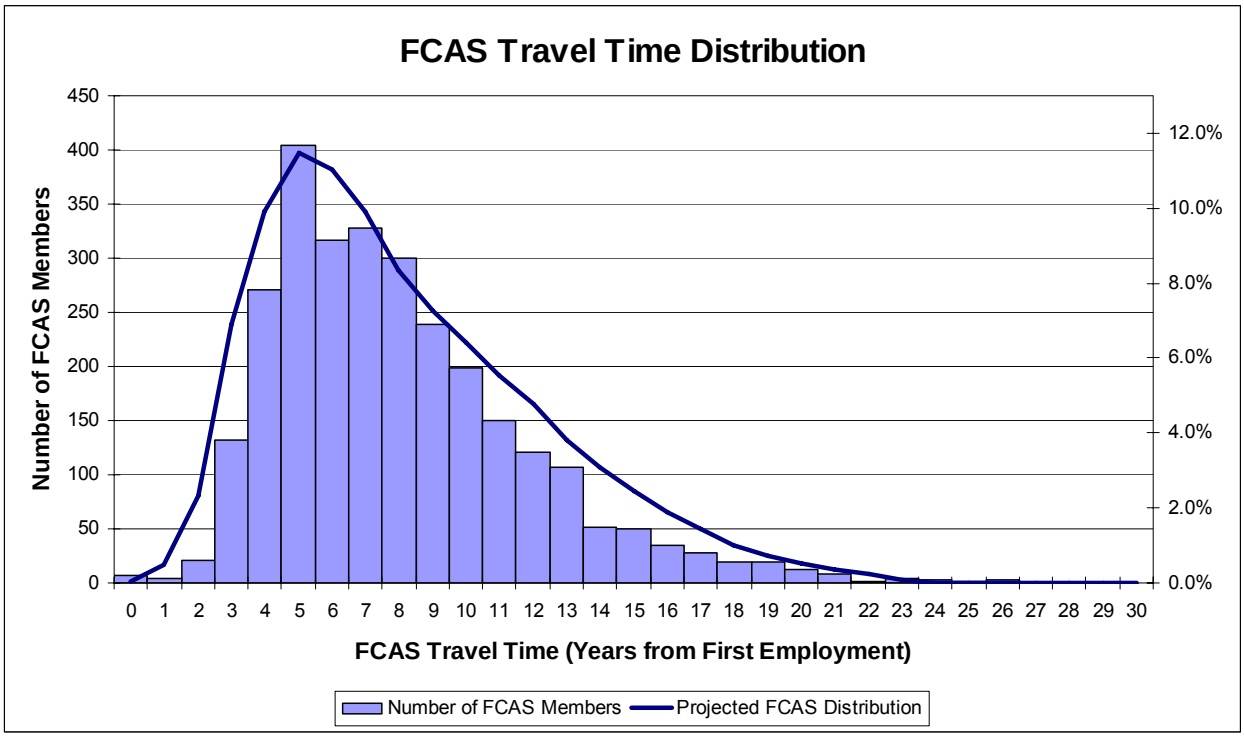


Chart 2



On the following pages, we present Table 2, which includes a summary of the travel time statistics with the data grouped in five-year intervals, and three charts with histograms. In Charts 3 and 4, we present projected travel time from first employment and first exam, respectively, in five-year intervals. In Chart 5, we present travel time from first exam in one-year intervals.

Table 2

Projected Travel Time from Date of First Exam and Date of First Employment

Year of First Exam	Actual Counts		Projected Ultimate Counts		Travel Time From First Examination		Selected Time From 1st Exam To 1st Employ.	Travel Time From First Employment	
	ACAS	FCAS	ACAS	FCAS	ACAS	FCAS		ACAS	FCAS
1970 to 1974	276	219	276	219	5.00	8.50	0.25	4.75	8.25
1975 to 1979	429	327	429	327	7.00	9.00	0.67	6.33	8.33
1980 to 1984	365	275	365	275	7.00	9.50	0.50	6.50	9.00
1985 to 1989	923	637	926	648	7.50	10.50	1.00	6.50	9.50
1990 to 1994	958	691	987	755	7.25	10.42	2.00	5.25	8.42
1995 to 1999	455	325	546	475	7.50	9.67	1.42	6.08	8.25
2000 to 2004	621	318	1,584	1,329	7.25	9.67	1.13	6.12	8.53
2005 to 2008	61	18	2,155	1,850	6.92	9.00	1.00	5.92	8.00

Chart 3

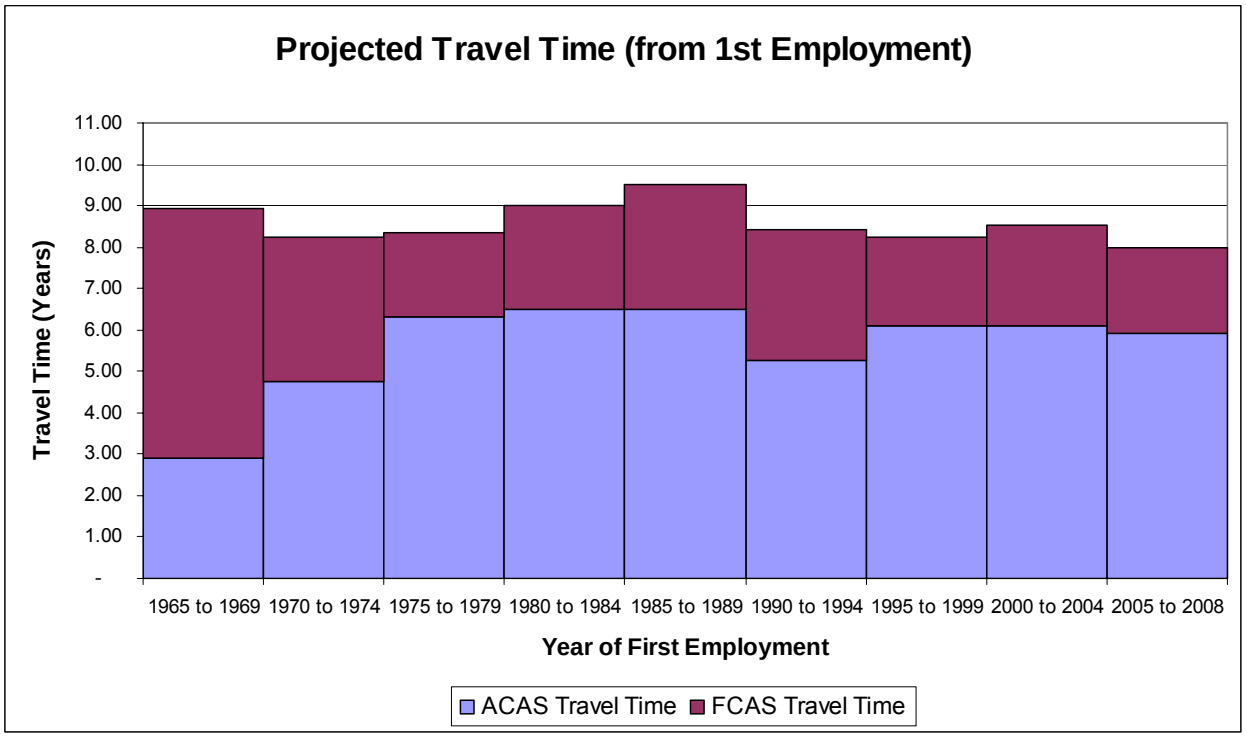


Chart 4

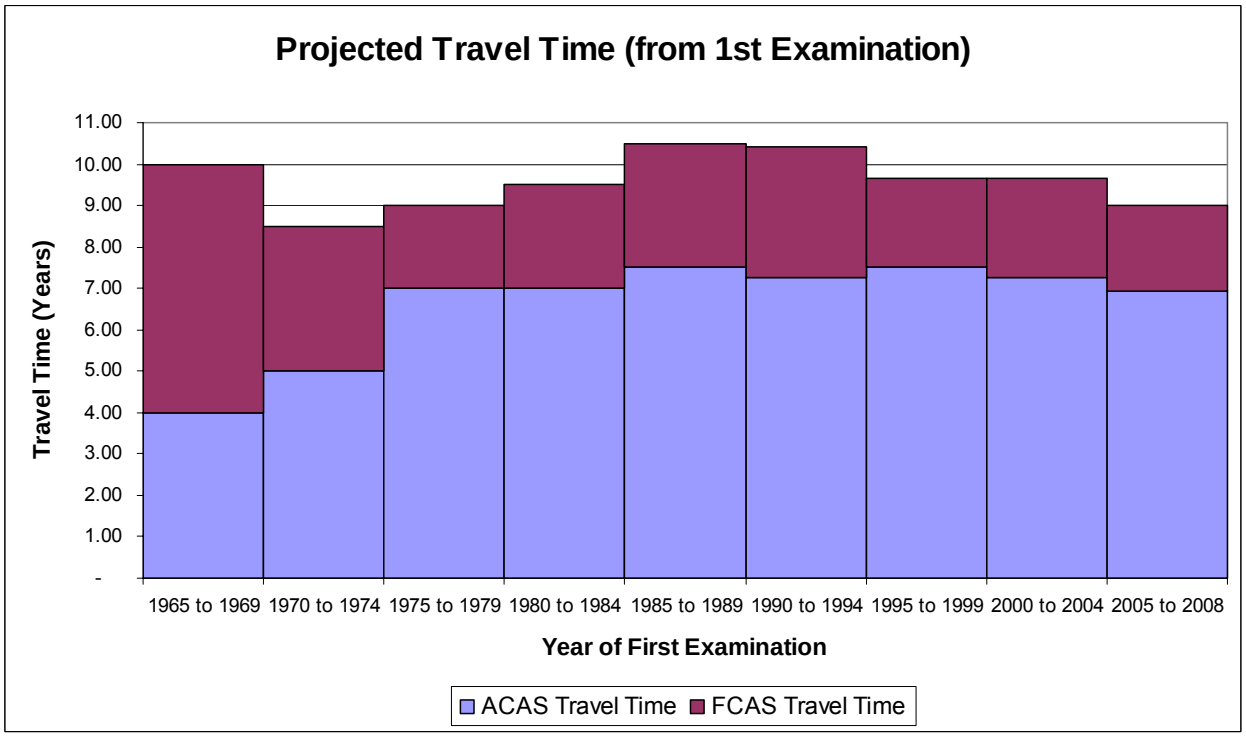


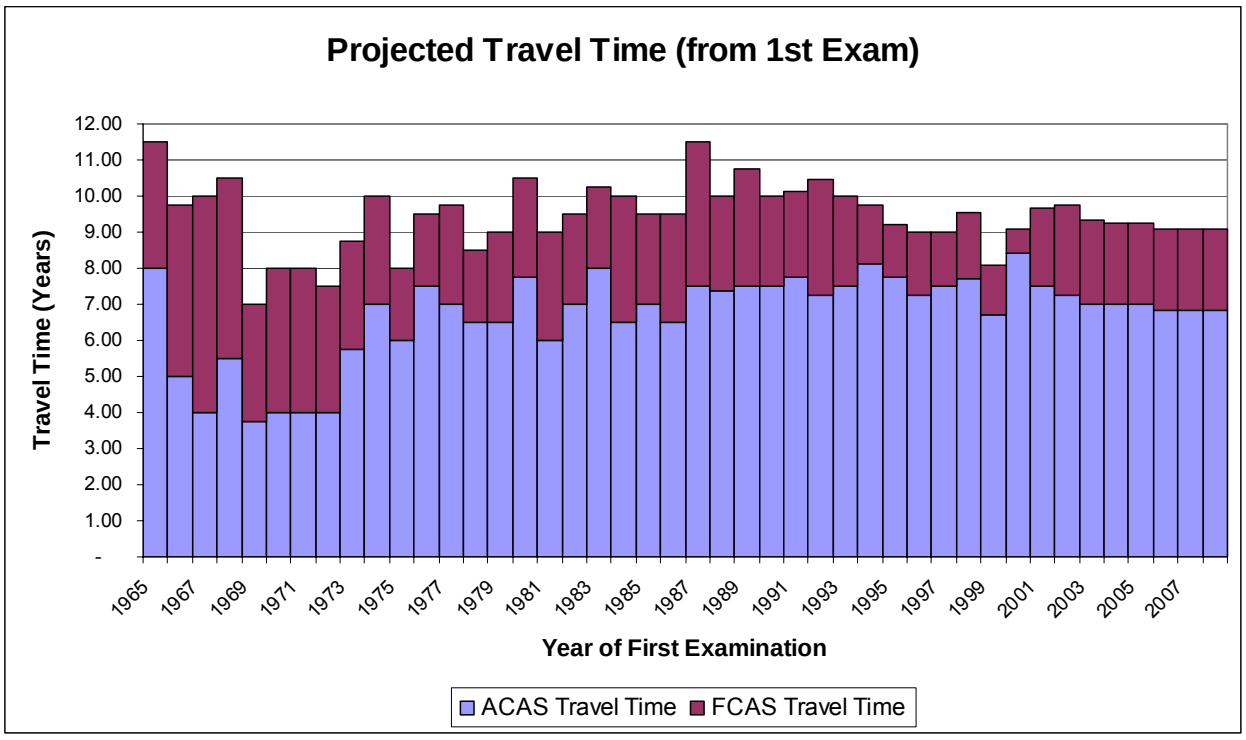
Table 2 and Chart 4 show that in the most recent years (i.e., 2005 to 2008), FCAS projected travel time from date of first exam is approximately nine years. The projected travel time for the most recent candidates from date of first exam to Fellowship improves by more than one year from the level in the late 1980s and early 1990s.

For Associates, travel time from first exam is roughly seven years and since first employment is six years. The projected travel time from date of first exam to Associateship has been fairly stable since the mid-1970s, when the number of Associateship exams was increased from five to seven. Projected travel time to Associateship, measured from date of first exam, decreased slightly from the 2007 Report. We believe that this change in projected travel time is most likely driven by changes in the selected assumptions, which are related to different and improved data, and not a material change in the underlying experience.

We have also compared the projected ACAS and FCAS travel time statistics for the 10th and 25th percentile to the median values. In general, our conclusion is that trends in projected travel times for the most efficient candidates are similar to trends for the median.

The selected time from date of first exam to date of first employment increased from 1970 through 1994 to a high of two years for the five-year period 1990 to 1994. One explanation is that more candidates were entering actuarial programs at universities and taking exams while at university. Another explanation could be related to candidate unemployment rates, giving rise to longer lag times between first exam and first employment. Since 1995, the selected time between first exam and first employment has declined significantly from two years to one year. As noted previously, these changes may be due to demographic changes which will be investigated further in future reports.

Chart 5



It should be noted that estimates for both ACAS and FCAS travel time for the most recent three or four years reflect limited actual experience; they are based primarily on the selected development patterns and a priori candidate success ratios.

We repeat our belief that estimating travel time from the date of first exam yields more reliable results, and confirms that that the improvement in travel time from date of first employment is real.

SUCCESS RATIOS

Table 3 below presents thirty years of success ratios for candidates by year of first exam, including the projected ultimate success ratios.

Table 3

Projected Ultimate Membership Counts and Success Ratios

Year of First Exam	CAS Candidate Count		ACAS Count			FCAS Count		
	Recorded	Projected Ultimate	Recorded	Projected Ultimate	Success Ratio	Recorded	Projected Ultimate	Success Ratio
PRIOR	846	846	699	699	83%	539	539	64%
1979	101	101	75	75	74%	62	62	61%
1980	85	85	66	66	78%	55	55	65%
1981	85	85	65	65	76%	53	53	62%
1982	104	104	72	72	69%	56	56	54%
1983	108	108	77	77	71%	48	48	44%
1984	129	129	85	85	66%	63	63	49%
1985	214	214	115	115	54%	83	83	39%
1986	299	299	147	147	49%	108	109	36%
1987	455	455	214	214	47%	139	141	31%
1988	500	500	187	188	38%	130	133	27%
1989	720	720	260	262	36%	177	182	25%
1990	919	919	270	273	30%	194	203	22%
1991	895	895	223	228	25%	156	166	19%
1992	880	880	203	209	24%	148	162	18%
1993	776	776	131	137	18%	101	115	15%
1994	706	706	131	140	20%	92	109	15%
1995	656	657	110	121	18%	70	88	13%
1996	522	523	94	107	20%	70	95	18%
1997	525	527	110	131	25%	78	115	22%
1998	314	316	76	97	31%	52	86	27%
1999	116	117	65	90	77%	55	91	78%
2000	838	851	165	260	31%	75	178	21%
2001	536	548	149	273	50%	94	250	46%
2002	685	707	161	373	53%	96	333	47%
2003	698	731	91	332	45%	39	283	39%
2004	727	781	55	346	44%	14	285	36%
2005	1,397	1,560	60	699	45%	18	576	37%
2006	1,197	1,417	1	567	40%	-	496	35%
2007	912	1,199	-	480	40%	-	420	35%
2008	445	1,023	-	409	40%	-	358	35%
TOTAL	17,390	18,779	4,157	7,337	39%	2,865	5,933	32%

The databases were constructed in the late 1980s; despite the best efforts of the CAS, data by date of first exam is not complete prior to 1990. As such, success ratios for years prior to 1990 are likely to be overstated and the number of candidates understated. We again note that candidates who have not passed an exam are excluded from the data for the 2008 Report. Thus, the success ratios have increased from the 2007 Report. We observe that success ratios declined in the mid-1990s. While we note increasing success ratios in recent years, it is important to recognize that estimates for the most recent six years reflect limited actual experience. The most recent years' success ratios are based primarily on the selected development patterns and a priori success ratios. Currently, we estimate that 40% of candidates will achieve their Associateship and 35% their Fellowship.

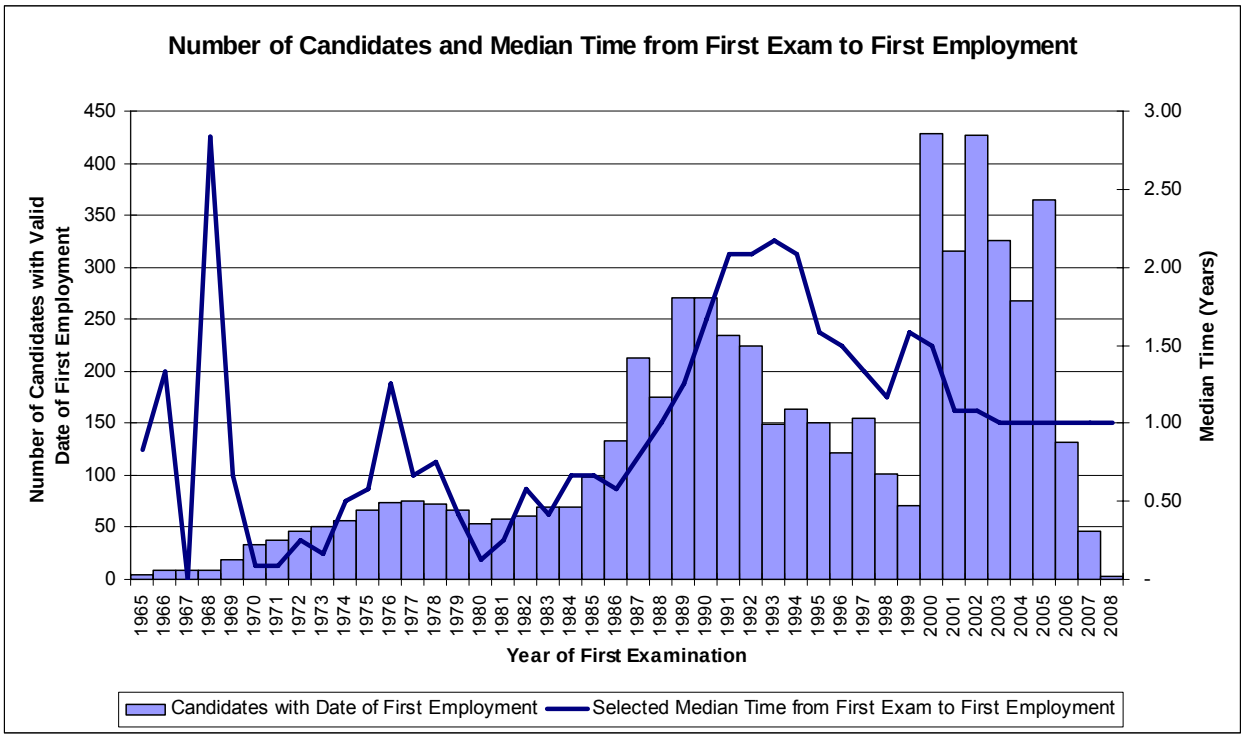
This chart shows a drop in the number of candidates attempting their first exam in the 1997 to 1999 years with a corresponding increase in new candidates in 2000. One explanation for this observation could be that candidates who may have otherwise started taking exams in these years waited until after the 2000 syllabus conversion to take their first exam. For candidates that elected to begin sitting in the years immediately prior to the transition, the exam progress has been exceptional.

The number of candidates increased dramatically in 2005 and has decreased in each subsequent year. We estimate the number of candidates expected in 2008 based on an incomplete year's data. Nevertheless, current indications show a continued decline in the number of candidates. We observe that success ratios for first exam-takers pre-2000 appear to be negatively correlated with the number of candidates; however, early indications show that this may not be the case with post-2000 first exam-takers.

TIME FROM FIRST EXAM TO FIRST EMPLOYMENT

Chart 6 below shows the number of candidates with a valid date of first employment (histogram) and the average time from first exam to first employment by year of first exam (line).

Chart 6



The selected time from first exam to first employment for years 2003 through 2008 is 1.00, and is based on our analysis of historical development. The actual data for the most recent years (which is not shown above) shows a decline in the median time between date of first exam and date of first employment. We expect that this value will continue to increase as more candidates are employed.

Appendix A contains exhibits showing ACAS and FCAS count triangles, the selected development factors, the initial selected success ratios, and the projected ultimate number of Associates and Fellows.

PASS RATIOS AND PROGRESS STATISTICS

Additional indicators of travel time include exam pass ratios and average candidate exam progress statistics. Exam pass ratios are the percentage of passing candidates sitting for each exam part. The exam progress statistic, which indicates the average number of exams passed per candidate, is the product of the pass ratios for any given sitting (i.e., the number of full exam equivalents passed per exam equivalent taken by a candidate) and the average number of exams taken by a candidate in the sitting (i.e., the average number of full exam equivalents taken per candidate).

We use data reflecting results through the July 2008 exam sitting (i.e., 2008 statistics do not represent a full year). We present the following four tables with pass ratios and progress statistics:

- Table 4 contains the number of exams taken, the number of candidates who passed the exam, and the raw pass ratio for exam years 2000 through 2008 for exams 1 through 9.

- Table 5 presents the exam progress, pass ratio, and average number of exams taken for the CAS-administered exams for spring 1983 through spring 2008. This table includes a timeline of key changes in the CAS exam structure and process to help explain many of the trends in the observed experience.

- Table 6 contains similar information as Table 5 for all candidates who took jointly-administered exams. We present the exam progress statistics separately for CAS and CAS-SOA jointly-administered exams because the two societies maintain independent databases with different candidate identification numbers.

- Table 7 presents the same statistics as Table 6 but only for candidates who indicated on their application form that they work in the P&C industry.

Table 4

Exam	Category	Examination Year								
		2000	2001	2002	2003	2004	2005	2006	2007	2008
1	Exams Taken	5,193	7,006	9,600	11,045	12,009	9,369	12,198	13,416	9,759
	Passed	1,475	2,345	3,809	4,370	4,218	3,588	4,290	4,949	3,779
	Raw Pass Ratio	28.4%	33.5%	39.7%	39.6%	35.1%	38.3%	35.2%	36.9%	38.7%
2	Exams Taken	3,855	4,230	5,307	6,066	7,181	9,721	9,268	7,835	4,847
	Passed	1,138	1,536	2,309	2,275	2,409	5,672	4,137	3,595	2,357
	Raw Pass Ratio	29.5%	36.3%	43.5%	37.5%	33.5%	58.3%	44.6%	45.9%	48.6%
3	Exams Taken	2,841	2,976	3,541	2,308	732	685	743	726	n/a
	Passed	966	1,256	1,450	921	245	252	248	348	n/a
	Raw Pass Ratio	34.0%	42.2%	40.9%	39.9%	33.5%	36.8%	33.4%	47.9%	n/a
3F	Exams Taken	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2,641
	Passed	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1,277
	Raw Pass Ratio	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	48.4%
3L	Exams Taken	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	242
	Passed	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	144
	Raw Pass Ratio	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	59.5%
4	Exams Taken	1,876	2,157	2,555	2,825	3,734	3,368	4,169	3,936	1,848
	Passed	665	900	1,303	1,436	1,896	1,740	2,285	1,813	868
	Raw Pass Ratio	35.4%	41.7%	51.0%	50.8%	50.8%	51.7%	54.8%	46.1%	47.0%
5	Exams Taken	606	524	458	497	563	679	708	892	911
	Passed	216	190	199	214	229	313	286	396	428
	Raw Pass Ratio	35.6%	36.3%	43.4%	43.1%	40.7%	46.1%	40.4%	44.4%	47.0%
6	Exams Taken	623	596	543	583	630	733	841	934	n/a
	Passed	189	208	217	228	235	300	332	347	n/a
	Raw Pass Ratio	30.3%	34.9%	40.0%	39.1%	37.3%	40.9%	39.5%	37.2%	n/a
7C	Exams Taken	40	48	47	58	48	60	74	80	83
	Passed	18	19	19	23	15	25	32	35	21
	Raw Pass Ratio	45.0%	39.6%	40.4%	39.7%	31.3%	41.7%	43.2%	43.8%	25.3%
7U	Exams Taken	516	494	442	378	373	405	449	459	575
	Passed	202	203	207	164	163	182	208	181	273
	Raw Pass Ratio	39.1%	41.1%	46.8%	43.4%	43.7%	44.9%	46.3%	39.4%	47.5%
8	Exams Taken	319	310	349	331	309	311	377	418	426
	Passed	129	124	176	170	148	131	177	192	201
	Raw Pass Ratio	40.4%	40.0%	50.4%	51.4%	47.9%	42.1%	46.9%	45.9%	47.2%
9	Exams Taken	324	308	299	338	360	416	469	607	n/a
	Passed	126	135	138	127	146	192	157	317	n/a
	Raw Pass Ratio	38.9%	43.8%	46.2%	37.6%	40.6%	46.2%	33.5%	52.2%	n/a

From Table 4, we observe a significant decrease in Exam 3 enrolment in 2003 and 2004. Starting in Fall 2003, the CAS began offering a separate Exam 3; the statistics for the Fall 2003 and subsequent sittings do not include those registering for SOA Exam 3. Starting in 2008, CAS Exam 3 was split into two parts: 3F and 3L. Exam 3F is jointly administered with the SOA (Course MFE), and enrollment figures include SOA candidates; Exam 3L is administered by the CAS only. We also point out that enrolment for the CAS Associateship and Fellowship exams has steadily increased since 2004. The raw pass ratios are in the high 40s for many exams in 2007-2008, compared to raw pass ratios in the mid-to-high 30s for many exam sittings in 2000 and 2001.

Table 5

EXAM PROGRESS STATISTICS FOR CAS-SPECIFIC EXAMS

CAS Examination Sitting	Exam Progress	Pass Ratio	Average # of Exams Taken	Timeline of Events
Spring 1983	0.36	0.35	1.02	*1983: CAS administered Exams 4-10.*
Fall 1983	0.29	0.29	1.01	
Spring 1984	0.38	0.38	1.01	
Fall 1984	0.35	0.35	1.01	
Spring 1985	0.36	0.36	1.02	
Fall 1985	0.40	0.39	1.02	
Spring 1986	0.37	0.37	1.02	
Fall 1986	0.38	0.37	1.01	
Spring 1987	0.37	0.36	1.02	
Fall 1987	0.35	0.35	1.01	
Spring 1988	0.35	0.34	1.02	
Fall 1988	0.36	0.36	1.01	
Spring 1989	0.36	0.35	1.01	
Fall 1989	0.39	0.39	1.01	
Spring 1990	0.33	0.33	1.01	
Fall 1990	0.26	0.34	0.76	*Fall 1990: CAS begins to administer Exam 3B; partitions Exam 5 into two parts.*
Spring 1991	0.33	0.38	0.87	
Fall 1991	0.28	0.36	0.77	
Spring 1992	0.30	0.38	0.8	*Spring 1992: CAS partitions Exam 4 into two parts.*
Fall 1992	0.30	0.38	0.81	
Spring 1993	0.29	0.38	0.78	
Fall 1993	0.30	0.38	0.78	
Spring 1994	0.30	0.38	0.79	
Fall 1994	0.30	0.39	0.76	
Spring 1995	0.29	0.37	0.78	
Fall 1995	0.27	0.36	0.76	
Spring 1996	0.31	0.40	0.78	
Fall 1996	0.29	0.40	0.74	
Spring 1997	0.30	0.38	0.79	
Fall 1997	0.24	0.33	0.73	
Spring 1998	0.31	0.38	0.81	
Fall 1998	0.24	0.34	0.73	
Spring 1999	0.30	0.40	0.77	
Fall 1999	0.29	0.40	0.73	

(continued on next page)

Table 5 (continued)

EXAM PROGRESS STATISTICS FOR CAS-SPECIFIC EXAMS (continued)				
CAS Examination Sitting	Exam Progress	Pass Ratio	Average # of Exams Taken	Timeline of Events
Spring 2000	0.38	0.38	1.01	*Spring 2000: CAS administers non-partitioned Exams 5-9.*
Fall 2000	0.38	0.38	1.01	
Spring 2001	0.39	0.39	1.01	
Fall 2001	0.38	0.38	1.00	*Fall 2001: CAS develops learning objectives for Fall Exams; implements pass mark panels.*
Spring 2002	0.46	0.46	1.00	*Spring 2002: CAS implements item writer training (starting with Fall Exams); develops learning objectives for Spring Exams.*
Fall 2002	0.42	0.42	1.00	
Spring 2003	0.46	0.45	1.01	
Fall 2003	0.40	0.40	1.00	*Fall 2003: CAS begins to administer its own version of Exam 3.*
Spring 2004	0.41	0.40	1.01	
Fall 2004	0.38	0.38	1.01	
Spring 2005	0.44	0.44	1.01	*January 2005: Validation by Educational Experience (VEE) introduced for Economics, Corporate Finance, and Applied Statistical Methods.*
Fall 2005	0.41	0.41	1.00	
Spring 2006	0.43	0.42	1.01	
Fall 2006	0.36	0.36	1.00	
Spring 2007	0.43	0.43	1.01	
Fall 2007	0.50	0.49	1.01	
Spring 2008	0.45	0.47	0.96	*Spring 2008: Exam 3 is segmented: Exam 3F is a joint exam and Exam 3L is a CAS-specific exam.*

Table 6

EXAM PROGRESS STATISTICS FOR JOINT-EXAMS (ALL CANDIDATES)				
CAS Examination Sitting	Exam Progress	Pass Ratio	Average # of Exams Taken	Timeline of Events
Spring 2000	0.28	0.27	1.03	
Fall 2000	0.35	0.34	1.03	
Spring 2001	0.37	0.36	1.04	
Fall 2001	0.40	0.38	1.05	
Spring 2002	0.44	0.42	1.07	
Fall 2002	0.45	0.43	1.06	
Spring 2003	0.41	0.39	1.06	
Fall 2003	0.45	0.42	1.07	*Fall 2003: CAS begins to administer its own version of Exam 3 (reported in Table 5 with CAS-specific exams).*
Spring 2004	0.36	0.34	1.06	
Fall 2004	0.43	0.41	1.06	
Spring 2005	0.60	0.54	1.11	*January 2005: Validation by Educational Experience (VEE) introduced for Economics, Corporate Finance, and Applied Statistical Methods.*
Fall 2005	0.45	0.41	1.09	
Spring 2006	0.46	0.44	1.06	
Fall 2006	0.46	0.43	1.06	
Spring 2007	0.45	0.43	1.05	
Fall 2007	0.45	0.43	1.06	
Spring 2008	0.43	0.44	0.96	*Spring 2008: Exam 3 is segmented; Exam 3F is a joint exam and Exam 3L is a CAS-specific exam.*

Table 7

EXAM PROGRESS STATISTICS FOR JOINT EXAMS (CAS CANDIDATES ONLY)				
CAS Examination Sitting	Exam Progress	Pass Ratio	Average # of Exams Taken	Timeline of Events
Spring 2000	0.23	0.23	1.02	
Fall 2000	0.28	0.27	1.01	
Spring 2001	0.28	0.27	1.01	
Fall 2001	0.34	0.33	1.03	
Spring 2002	0.37	0.36	1.04	
Fall 2002	0.49	0.47	1.04	
Spring 2003	0.41	0.39	1.04	
Fall 2003	0.45	0.44	1.03	*Fall 2003: CAS begins to administer its own version of Exam 3 (reported in Table 5 with CAS-specific exams).*
Spring 2004	0.32	0.31	1.04	
Fall 2004	0.42	0.41	1.03	
Spring 2005	0.57	0.54	1.05	*January 2005: Validation by Educational Experience (VEE) introduced for Economics, Corporate Finance, and Applied Statistical Methods.*
Fall 2005	0.48	0.46	1.04	
Spring 2006	0.48	0.47	1.02	
Fall 2006	0.52	0.51	1.03	
Spring 2007	0.43	0.42	1.03	
Fall 2007	0.47	0.46	1.01	
Spring 2008	0.40	0.46	0.88	*Spring 2008: Exam 3 is segmented; Exam 3F is a joint exam and Exam 3L is a CAS-specific exam.*

Based on our analysis of exam progress statistics, we observe the following:

- In the most recent years, there are more candidates taking the upper-level CAS-administered exams and the pass ratios for these exams are generally higher than in 2000 and 2001. For jointly-administered exams, the pass ratios are higher in the more recent years than in 2000 and 2001. The average number of exams taken per candidate was relatively stable for candidates taking the jointly-administered exams (except for 2008).
- The average number of exams taken during the partitioning period of the 1990s should be viewed cautiously. The database does not contain records for all failed attempts on jointly-administered exams. These exam attempts are therefore not contemplated in the average number of exams taken. During the partitioning period, it was possible for a candidate to take partial exams under the CAS system at the same time as exams in the CAS and SOA jointly-administered structure (e.g., Exams 1/100, 2/110, 3A/120, 3C/135). The jointly-administered exams are not included in the statistics in Tables 6 and 7 unless the candidate passed the given exam.

APPENDIX A: EXHIBITS UNDERLYING ACTUARIAL ANALYSIS

2008 CAS Travel Time Report

Summary of Projected Statistics

Year of First Exam	Membership Counts: CAS Candidate (a)	Membership Counts: ACAS (a)	Membership Counts: FCAS (a)	Selected Ultimate Counts: CAS Candidate (b)	Selected Ultimate Counts: ACAS (c)	Selected Ultimate Counts: FCAS (d)	Expected New Counts: CAS Candidate [(5) - (2)]	Expected New Counts: ACAS [(6) - (3)]	Expected New Counts: FCAS [(7) - (4)]	Implied ACAS Success Rate [(6) / (5)]	Implied FCAS Success Rate [(7) / (5)]	Percent of ACAS to be new FCAS [(7) / (6)]
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
PRIOR	846	699	539	846	699	539	0	0	0	83%	64%	77%
1979	101	75	62	101	75	62	0	0	0	74%	61%	83%
1980	85	66	55	85	66	55	0	0	0	78%	65%	83%
1981	85	65	53	85	65	53	0	0	0	76%	62%	82%
1982	104	72	56	104	72	56	0	0	0	69%	54%	78%
1983	108	77	48	108	77	48	0	0	0	71%	44%	62%
1984	129	85	63	129	85	63	0	0	0	66%	49%	74%
1985	214	115	83	214	115	83	0	0	0	54%	39%	72%
1986	299	147	108	299	147	109	0	0	1	49%	36%	74%
1987	455	214	139	455	214	141	0	0	2	47%	31%	66%
1988	500	187	130	500	188	133	0	1	3	38%	27%	71%
1989	720	260	177	720	262	182	0	2	5	36%	25%	69%
1990	919	270	194	919	273	203	0	3	9	30%	22%	74%
1991	895	223	156	895	228	166	0	5	10	25%	19%	73%
1992	880	203	148	880	209	162	0	6	14	24%	18%	78%
1993	776	131	101	776	137	115	0	6	14	18%	15%	84%
1994	706	131	92	706	140	109	0	9	17	20%	15%	78%
1995	656	110	70	657	121	88	1	11	18	18%	13%	73%
1996	522	94	70	523	107	95	1	13	25	20%	18%	89%
1997	525	110	78	527	131	115	2	21	37	25%	22%	88%
1998	314	76	52	316	97	86	2	21	34	31%	27%	89%
1999	116	65	55	117	90	91	1	25	36	77%	78%	101%
2000	838	165	75	851	260	178	13	95	103	31%	21%	68%
2001	536	149	94	548	273	250	12	124	156	50%	46%	92%
2002	685	161	96	707	373	333	22	212	237	53%	47%	89%
2003	698	91	39	731	332	283	33	241	244	45%	39%	85%
2004	727	55	14	781	346	285	54	291	271	44%	36%	82%
2005	1,397	60	18	1,560	699	576	163	639	558	45%	37%	82%
2006	1,197	1	0	1,417	567	496	220	566	496	40%	35%	87%
2007	912	0	0	1,199	480	420	287	480	420	40%	35%	88%
2008	445	0	0	1,023	409	358	578	409	358	40%	35%	88%
Total	17,390	4,157	2,865	18,779	7,337	5,933	1,389	3,180	3,068	39%	32%	81%

Notes:

(a) *From CAS membership database as of September 2008.*

(b) *From CAS 2008 Travel Time Report, Appendix A, Exhibit 3, Sheet 3, Column (4).*

(c) *From CAS 2008 Travel Time Report, Appendix A, Exhibit 2, Sheet 2, Column (9).*

(d) *From CAS 2008 Travel Time Report, Appendix A, Exhibit 2, Sheet 1, Column (9).*

2008 CAS Travel Time Report

Selected Ultimate Counts: FCAS Membership

Year of First Exam	CAS Candidate Count	Estimated Ultimate Candidate Count	FCAS Count	Projected Ultimate FCAS Members				Selected Ultimate FCAS Count	Implied FCAS Success Rate
				Chain Ladder	A Priori Ultimate	Single BF Projection	Double BF Projection		
(a)	*(a)*	*(b)*	*(a)*	*(c)*	*(d)*	*(e)*	*(f)*	*(g)*	*[(9) / (3)]*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
PRIOR	846	846	539	539	539	539	539	539	63.7%
1979	101	101	62	62	62	62	62	62	61.4%
1980	85	85	55	55	55	55	55	55	64.7%
1981	85	85	53	53	53	53	53	53	62.4%
1982	104	104	56	56	56	56	56	56	53.8%
1983	108	108	48	48	48	48	48	48	44.4%
1984	129	129	63	63	63	63	63	63	48.8%
1985	214	214	83	83	83	83	83	83	38.8%
1986	299	299	108	109	109	109	109	109	36.5%
1987	455	455	139	141	141	141	141	141	31.0%
1988	500	500	130	133	133	133	133	133	26.6%
1989	720	720	177	182	182	182	182	182	25.3%
1990	919	919	194	203	203	203	203	203	22.1%
1991	895	895	156	166	166	166	166	166	18.5%
1992	880	880	148	162	162	162	162	162	18.4%
1993	776	776	101	115	115	115	115	115	14.8%
1994	706	706	92	109	109	109	109	109	15.4%
1995	656	657	70	88	88	88	88	88	13.4%
1996	522	523	70	95	95	95	95	95	18.2%
1997	525	527	78	115	115	115	115	115	21.8%
1998	314	316	52	86	86	86	86	86	27.2%
1999	116	117	55	106	41	75	91	91	77.8%
2000	838	851	75	178	298	247	218	178	20.9%
2001	536	548	94	302	192	226	250	250	45.6%
2002	685	707	96	489	247	295	333	333	47.1%
2003	698	731	39	401	256	270	283	283	38.7%
2004	727	781	14	496	273	279	285	285	36.5%
2005	1,397	1,560	18	3,568	546	561	576	576	36.9%
2006	1,197	1,417	0	0	496	496	496	496	35.0%
2007	912	1,199	0	n/a	420	420	420	420	35.0%
2008	445	1,023	0	n/a	358	358	358	358	35.0%
Total	17,390	18,779	2,865	8,203	5,790	5,890	5,973	5,933	31.6%

Notes:

(a) From CAS membership database as of September 2008.

(b) From CAS 2008 Travel Time Report, Appendix A, Exhibit 3, Sheet 3, Column (4).

(c) From CAS 2008 Travel Time Report, Appendix A, Exhibit 3, Sheet 1, Column (5).

(d) From CAS 2008 Travel Time Report, Appendix A, Exhibit 3, Sheet 1, Column (7).

(e) From CAS 2008 Travel Time Report, Appendix A, Exhibit 3, Sheet 1, Column (9).

(f) From CAS 2008 Travel Time Report, Appendix A, Exhibit 3, Sheet 1, Column (10).

(g) Selected based on Columns (4) through (8).

2008 CAS Travel Time Report

Selected Ultimate Counts: ACAS Membership

Year of First Exam	CAS Candidate Count	Estimated Ultimate Candidate Count	ACAS Count	Projected Ultimate ACAS Count				Selected Ultimate ACAS Count	Implied ACAS Success Rate
				Chain Ladder	A Priori Ultimate	Single BF Projection	Double BF Projection		
(a)	*(a)*	*(b)*	*(a)*	*(c)*	*(d)*	*(e)*	*(f)*	*(g)*	*[(9) / (3)]*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
PRIOR	846	846	699	699	699	699	699	699	82.6%
1979	101	101	75	75	75	75	75	75	74.3%
1980	85	85	66	66	66	66	66	66	77.6%
1981	85	85	65	65	65	65	65	65	76.5%
1982	104	104	72	72	72	72	72	72	69.2%
1983	108	108	77	77	77	77	77	77	71.3%
1984	129	129	85	85	85	85	85	85	65.9%
1985	214	214	115	115	115	115	115	115	53.7%
1986	299	299	147	147	147	147	147	147	49.2%
1987	455	455	214	214	214	214	214	214	47.0%
1988	500	500	187	188	188	188	188	188	37.6%
1989	720	720	260	262	262	262	262	262	36.4%
1990	919	919	270	273	273	273	273	273	29.7%
1991	895	895	223	228	228	228	228	228	25.5%
1992	880	880	203	209	209	209	209	209	23.8%
1993	776	776	131	137	137	137	137	137	17.7%
1994	706	706	131	140	140	140	140	140	19.8%
1995	656	657	110	121	121	121	121	121	18.4%
1996	522	523	94	107	107	107	107	107	20.5%
1997	525	527	110	131	131	131	131	131	24.9%
1998	314	316	76	97	97	97	97	97	30.7%
1999	116	117	65	90	47	78	87	90	76.9%
2000	838	851	165	260	340	289	270	260	30.6%
2001	536	548	149	290	219	255	273	273	49.8%
2002	685	707	161	432	283	338	373	373	52.8%
2003	698	731	91	388	292	315	332	332	45.4%
2004	727	781	55	466	312	330	346	346	44.3%
2005	1,397	1,560	60	1,706	624	662	699	699	44.8%
2006	1,197	1,417	1	128	567	564	561	567	40.0%
2007	912	1,199	0	0	480	477	475	480	40.0%
2008	445	1,023	0	n/a	409	409	409	409	40.0%
Total	17,390	18,779	4,157	7,268	7,081	7,225	7,333	7,337	39.1%

Notes:

(a) From CAS membership database as of September 2008.

(b) From CAS 2008 Travel Time Report, Appendix A, Exhibit 3, Sheet 3, Column (4).

(c) From CAS 2008 Travel Time Report, Appendix A, Exhibit 3, Sheet 2, Column (5).

(d) From CAS 2008 Travel Time Report, Appendix A, Exhibit 3, Sheet 2, Column (7).

(e) From CAS 2008 Travel Time Report, Appendix A, Exhibit 3, Sheet 2, Column (9).

(f) From CAS 2008 Travel Time Report, Appendix A, Exhibit 3, Sheet 2, Column (10).

(g) Selected based on Columns (4) through (8).

2008 CAS Travel Time Report

Projected Ultimate Counts: FCAS Membership

Year of First Exam	Estimated Ultimate Candidate Count	FCAS Count	Chain Ladder Approach: Age to Ultimate Factor	Chain Ladder Approach: Projected Ultimate FCAS Count	Projected FCAS Success Rate	A Priori Ultimate FCAS Count	B-F Approaches: Expected % of new FCAS	B-F Approaches: Single BF Ultimate FCAS Count	B-F Approaches: Double BF Ultimate FCAS Count
	(a)	*(b)*	*(c)*	*[(3) x (4)]*	*[(5) / (2)]*	*(d)*	*[100.0% - 1 / (4)]*	*[(7) x (8) + (3)]*	*[(9) x (8) + (3)]*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
PRIOR	846	539	1.000	539	64%	539	0.0%	539	539
1979	101	62	1.000	62	61%	62	0.0%	62	62
1980	85	55	1.000	55	65%	55	0.0%	55	55
1981	85	53	1.000	53	62%	53	0.0%	53	53
1982	104	56	1.000	56	54%	56	0.0%	56	56
1983	108	48	1.000	48	44%	48	0.0%	48	48
1984	129	63	1.001	63	49%	63	0.1%	63	63
1985	214	83	1.004	83	39%	83	0.3%	83	83
1986	299	108	1.007	109	36%	109	0.7%	109	109
1987	455	139	1.012	141	31%	141	1.2%	141	141
1988	500	130	1.020	133	27%	133	1.9%	133	133
1989	720	177	1.030	182	25%	182	2.9%	182	182
1990	919	194	1.046	203	22%	203	4.4%	203	203
1991	895	156	1.067	166	19%	166	6.2%	166	166
1992	880	148	1.095	162	18%	162	8.7%	162	162
1993	776	101	1.134	115	15%	115	11.8%	115	115
1994	706	92	1.185	109	15%	109	15.6%	109	109
1995	657	70	1.256	88	13%	88	20.4%	88	88
1996	523	70	1.350	95	18%	95	25.9%	95	95
1997	527	78	1.478	115	22%	115	32.4%	115	115
1998	316	52	1.656	86	27%	86	39.6%	86	86
1999	117	55	1.921	106	91%	41	47.9%	75	91
2000	851	75	2.372	178	21%	298	57.8%	247	218
2001	548	94	3.214	302	55%	192	68.9%	226	250
2002	707	96	5.094	489	69%	247	80.4%	295	333
2003	731	39	10.290	401	55%	256	90.3%	270	283
2004	781	14	35.398	496	64%	273	97.2%	279	285
2005	1,560	18	198.230	3,568	229%	546	99.5%	561	576
2006	1,417	0	3,568.146	0	0%	496	100.0%	496	496
2007	1,199	0		n/a	n/a	420	100.0%	420	420
2008	1,023	0		n/a	n/a	358	100.0%	358	358
Total	18,779	2,865		8,203	44%	5,790		5,890	5,973

(11) Averages:

(i)	Simple Average (1994 - 1998)	19%
(ii)	Simple Average (1999 - 2003)	58%
(iii)	Medial Average Ex. 1 (1997 - 2003)	46%
(iv)	Medial Average Ex. 1 (1994 - 2003)	41%
(v)	Volume Average (1994 - 1998)	18%
(vi)	Volume Average (1999 - 2003)	50%
(vii)	Volume Average (1994 - 2003)	35%

(12) Selected FCAS Success Rate 35%

Notes:

(a) From CAS 2008 Travel Time Report, Appendix A, Exhibit 3, Sheet 3, Column (4).

(b) From CAS membership database as of September 2008.

(c) From CAS 2008 Travel Time Report, Appendix A, Exhibit 4a, Sheets 1 and 2: FCAS Count Development Triangle.

(d) First Exam Years 1998 & Prior: = (5). First Exam Years 1999 & Subsequent: = (2) x (12).

2008 CAS Travel Time Report

Projected Ultimate Counts: ACAS Membership

Year of First Exam	Estimated Ultimate Candidate Count	ACAS Count	Chain Ladder Approach: Age to Ultimate Factor	Chain Ladder Approach: Projected Ultimate ACAS Count	Projected ACAS Success Rate	A Priori Ultimate ACAS Count	B-F Approaches: Expected % of new ACAS	B-F Approaches: Single BF Ultimate ACAS Count	B-F Approaches: Double BF Ultimate ACAS Count
	(a)	*(b)*	*(c)*	*[(3) x (4)]*	*[(5) / (2)]*	*(d)*	*[100.0% - 1 / (4)]*	*[(7) x (8) + (3)]*	*[(9) x (8) + (3)]*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
PRIOR	846	699	1.000	699	83%	699	0.0%	699	699
1979	101	75	1.000	75	74%	75	0.0%	75	75
1980	85	66	1.000	66	78%	66	0.0%	66	66
1981	85	65	1.000	65	76%	65	0.0%	65	65
1982	104	72	1.000	72	69%	72	0.0%	72	72
1983	108	77	1.000	77	71%	77	0.0%	77	77
1984	129	85	1.000	85	66%	85	0.0%	85	85
1985	214	115	1.000	115	54%	115	0.0%	115	115
1986	299	147	1.000	147	49%	147	0.0%	147	147
1987	455	214	1.001	214	47%	214	0.1%	214	214
1988	500	187	1.004	188	38%	188	0.4%	188	188
1989	720	260	1.007	262	36%	262	0.7%	262	262
1990	919	270	1.012	273	30%	273	1.2%	273	273
1991	895	223	1.020	228	25%	228	2.0%	228	228
1992	880	203	1.031	209	24%	209	3.0%	209	209
1993	776	131	1.046	137	18%	137	4.4%	137	137
1994	706	131	1.066	140	20%	140	6.2%	140	140
1995	657	110	1.097	121	18%	121	8.8%	121	121
1996	523	94	1.137	107	20%	107	12.1%	107	107
1997	527	110	1.192	131	25%	131	16.1%	131	131
1998	316	76	1.275	97	31%	97	21.6%	97	97
1999	117	65	1.390	90	77%	47	28.1%	78	87
2000	851	165	1.574	260	31%	340	36.5%	289	270
2001	548	149	1.944	290	53%	219	48.6%	255	273
2002	707	161	2.682	432	61%	283	62.7%	338	373
2003	731	91	4.264	388	53%	292	76.5%	315	332
2004	781	55	8.464	466	60%	312	88.2%	330	346
2005	1,560	60	28.439	1,706	109%	624	96.5%	662	699
2006	1,417	1	127.975	128	9%	567	99.2%	564	561
2007	1,199	0	191.962	0	n/a	480	99.5%	477	475
2008	1,023	0		n/a	n/a	409	100.0%	409	409
Total	18,779	4,157		7,268		7,081		7,225	7,333

(11) Averages:

(i)	Simple Average (1994 - 1998)	23%
(ii)	Simple Average (1999 - 2003)	55%
(iii)	Medial Average Ex. 1 (1997 - 2003)	46%
(iv)	Medial Average Ex. 1 (1994 - 2003)	42%
(v)	Volume Average (1994 - 1998)	22%
(vi)	Volume Average (1999 - 2003)	49%
(vii)	Volume Average (1994 - 2003)	36%

(12) Selected ACAS Success Rate 40%

Notes:

(a) From CAS 2008 Travel Time Report, Appendix A, Exhibit 3, Sheet 3, Column (4).

(b) From CAS membership database as of September 2008.

(c) From CAS 2008 Travel Time Report, Appendix A, Exhibit 4b, Sheets 1 and 2: ACAS Count Development Triangle.

(d) First Exam Years 1998 & Prior: = (5). First Exam Years 1999 & Subsequent: = (2) x (12).

2008 CAS Travel Time Report

Projected Ultimate Counts: CAS Candidates

Year of First Exam	CAS Candidates Count	Age to Ultimate Factor	Estimated Ultimate CAS Candidate Count
(a)	*(a)*	*(b)*	*[(2) x (3)]*
(1)	(2)	(3)	(4)
PRIOR	846	1.000	846
1979	101	1.000	101
1980	85	1.000	85
1981	85	1.000	85
1982	104	1.000	104
1983	108	1.000	108
1984	129	1.000	129
1985	214	1.000	214
1986	299	1.000	299
1987	455	1.000	455
1988	500	1.000	500
1989	720	1.000	720
1990	919	1.000	919
1991	895	1.000	895
1992	880	1.000	880
1993	776	1.000	776
1994	706	1.001	706
1995	656	1.001	657
1996	522	1.003	523
1997	525	1.004	527
1998	314	1.007	316
1999	116	1.010	117
2000	838	1.015	851
2001	536	1.022	548
2002	685	1.032	707
2003	698	1.048	731
2004	727	1.074	781
2005	1,397	1.117	1,560
2006	1,197	1.184	1,417
2007	912	1.314	1,199
2008	445	2.300	1,023
Total	17,390		18,779

Notes:

(a) From CAS membership database as of September 2008.

(b) From CAS 2008 Travel Time Report, Appendix A, Exhibit 4c, Sheets 1 and 2: CAS Candidate Count Development Triangle.

CAS 2008 Travel Time Report

FCAS Membership Development Triangle

FCAS Count

First Exam Year	9	21	33	45	57	69	81	93	105	117	129	141	153	165	177
Prior	0	0	0	5	25	70	126	192	253	290	341	376	416	441	457
1979	0	0	0	0	1	4	12	17	26	35	40	46	50	52	54
1980	0	0	0	0	0	1	5	11	19	25	30	33	38	42	43
1981	0	0	0	0	1	5	13	21	25	32	36	40	46	51	51
1982	0	0	0	0	0	2	6	16	22	30	33	38	42	44	45
1983	0	0	0	0	0	1	6	11	15	20	25	34	36	39	40
1984	0	0	0	1	3	6	10	16	23	31	37	41	48	55	56
1985	0	0	0	0	0	5	12	23	35	43	49	57	65	72	73
1986	0	0	0	0	2	9	18	31	47	57	66	75	85	91	98
1987	0	0	0	0	2	7	20	35	45	62	67	78	84	92	98
1988	0	0	0	0	2	10	19	34	48	63	71	85	92	101	107
1989	0	0	0	0	3	9	20	39	54	74	95	114	131	147	161
1990	0	0	0	0	0	15	34	53	72	92	114	128	144	165	175
1991	0	0	0	0	3	7	17	39	56	77	97	108	121	137	143
1992	0	0	0	0	2	7	21	34	57	72	94	107	118	126	134
1993	0	0	0	0	1	8	15	28	39	55	65	75	81	86	94
1994	0	0	0	0	1	5	10	21	31	54	70	77	83	88	92
1995	0	0	0	0	1	6	15	30	39	47	53	60	65	70	
1996	0	0	0	1	7	14	20	29	45	58	63	66	70		
1997	0	0	0	1	2	14	31	44	56	68	75	78			
1998	0	0	0	0	4	10	15	24	34	44	52				
1999	0	0	1	2	2	7	19	38	47	55					
2000	0	0	1	1	4	16	35	55	75						
2001	0	0	0	2	10	31	61	94							
2002	0	0	0	0	16	48	96								
2003	0	0	0	0	9	39									
2004	0	0	0	2	14										
2005	0	0	1	18											
2006	0	0	0												
2007	0	0													
2008	0														

Age-to-Age Factors

First Exam Year	9 - 21	21 - 33	33 - 45	45 - 57	57 - 69	69 - 81	81 - 93	93 - 105	105 - 117	117 - 129	129 - 141	141 - 153	153 - 165	165 - 177	177 - 189
Prior				5.000	2.800	1.800	1.524	1.318	1.146	1.176	1.103	1.106	1.060	1.036	1.026
1979					4.000	3.000	1.417	1.529	1.346	1.143	1.150	1.087	1.040	1.038	1.000
1980						5.000	2.200	1.727	1.316	1.200	1.100	1.152	1.105	1.024	1.093
1981					5.000	2.600	1.615	1.190	1.280	1.125	1.111	1.150	1.109	1.000	1.000
1982						3.000	2.667	1.375	1.364	1.100	1.152	1.105	1.048	1.023	1.044
1983						6.000	1.833	1.364	1.333	1.250	1.360	1.059	1.083	1.026	1.025
1984				3.000	2.000	1.667	1.600	1.438	1.348	1.194	1.108	1.171	1.146	1.018	1.054
1985						2.400	1.917	1.522	1.229	1.140	1.163	1.140	1.108	1.014	1.014
1986					4.500	2.000	1.722	1.516	1.213	1.158	1.136	1.133	1.071	1.077	1.000
1987					3.500	2.857	1.750	1.286	1.378	1.081	1.164	1.077	1.095	1.065	1.071
1988					5.000	1.900	1.789	1.412	1.313	1.127	1.197	1.082	1.098	1.059	1.037
1989					3.000	2.222	1.950	1.385	1.370	1.284	1.200	1.149	1.122	1.095	1.012
1990						2.267	1.559	1.358	1.278	1.239	1.123	1.125	1.146	1.061	1.046
1991					2.333	2.429	2.294	1.436	1.375	1.260	1.113	1.120	1.132	1.044	1.028
1992					3.500	3.000	1.619	1.676	1.263	1.306	1.138	1.103	1.068	1.063	1.052
1993					8.000	1.875	1.867	1.393	1.410	1.182	1.154	1.080	1.062	1.093	1.074
1994					5.000	2.000	2.100	1.476	1.742	1.296	1.100	1.078	1.060	1.045	
1995					6.000	2.500	2.000	1.300	1.205	1.128	1.132	1.083	1.077		
1996				7.000	2.000	1.429	1.450	1.552	1.289	1.086	1.048	1.061			
1997				2.000	7.000	2.214	1.419	1.273	1.214	1.103	1.040				
1998					2.500	1.500	1.600	1.417	1.294	1.182					
1999			2.000	1.000	3.500	2.714	2.000	1.237	1.170						
2000			1.000	4.000	4.000	2.188	1.571	1.364							
2001				5.000	3.100	1.968	1.541								
2002					3.000	2.000									
2003					4.333										
2004				7.000											
2005			18.000												
2006															
2007															
2008															

Averages

	9 - 21	21 - 33	33 - 45	45 - 57	57 - 69	69 - 81	81 - 93	93 - 105	105 - 117	117 - 129	129 - 141	141 - 153	153 - 165	165 - 177	177 - 189
Simple Avg															
All Yrs			7.000	4.143	4.063	2.530	1.804	1.419	1.320	1.179	1.142	1.109	1.092	1.047	1.037
Latest 5			18.000	5.333	3.587	2.074	1.626	1.368	1.235	1.159	1.095	1.081	1.080	1.061	1.043
Latest 7			7.000	4.250	3.919	2.002	1.655	1.374	1.332	1.183	1.104	1.093	1.095	1.066	1.046
Latest 15			7.000	4.333	4.090	2.147	1.767	1.405	1.316	1.184	1.145	1.104	1.095	1.047	1.037
Medial Avg															
Latest 7x1			2.000	4.500	3.587	1.974	1.632	1.366	1.283	1.178	1.106	1.093	1.092	1.064	1.047
Latest 15x1			2.000	4.500	3.939	2.137	1.754	1.397	1.295	1.183	1.137	1.103	1.095	1.047	1.035
Volume Wtd															
All Yrs			7.000	4.200	3.447	2.146	1.712	1.402	1.310	1.186	1.136	1.109	1.097	1.055	1.036
Latest 5			18.000	5.600	3.439	2.018	1.584	1.353	1.231	1.155	1.092	1.083	1.083	1.060	1.040
Latest 7			7.000	4.286	3.511	1.979	1.602	1.357	1.309	1.186	1.104	1.098	1.102	1.066	1.043
Latest 15			7.000	4.333	3.400	2.068	1.696	1.395	1.306	1.191	1.136	1.107	1.099	1.055	1.036

Development Factor Selection

	9 - 21	21 - 33	33 - 45	45 - 57	57 - 69	69 - 81	81 - 93	93 - 105	105 - 117	117 - 129	129 - 141	141 - 153	153 - 165	165 - 177	177 - 189
Prior Selected	1.000	1.000	13.000	5.063	1.923	1.540	1.427	1.270	1.180	1.120	1.100	1.090	1.080	1.060	1.040
User Selected			18.000	5.600	3.440	2.020	1.585	1.355	1.235	1.160	1.120	1.095	1.075	1.060	1.045
Selected Result			18.000	5.600	3.440	2.020	1.585	1.355	1.235	1.160	1.120	1.095	1.075	1.060	1.045
FacToUlt			3568.146	198.230	35.398	10.290	5.094	3.214	2.372	1.921	1.656	1.478	1.350	1.256	1.185
Percent of Ult			0.000	0.005	0.028	0.097	0.196	0.311	0.422	0.521	0.604	0.676	0.741	0.796	0.844

CAS 2008 Travel Time Report

FCAS Membership Development Triangle

FCAS Count

First Exam Year	189	201	213	225	237	249	261	273	285	297	309	321	333	345	357
Prior	469	482	495	507	514	520	524	527	529	531	532	535	537	538	539
1979	54	57	59	59	59	61	61	61	62	62	62	62	62	62	62
1980	47	47	49	51	52	52	53	54	54	54	55	55	55	55	
1981	51	52	52	52	52	52	52	52	52	53	53	53	53		
1982	47	49	50	52	52	53	53	55	55	55	56	56			
1983	41	42	43	43	46	47	48	48	48	48	48				
1984	59	59	61	61	62	63	63	63	63	63					
1985	74	77	80	80	80	82	83	83	83						
1986	98	100	102	104	105	106	108	108							
1987	105	116	122	132	135	138	139								
1988	111	119	121	127	127	130									
1989	163	168	174	176	177										
1990	183	189	191	194											
1991	147	152	156												
1992	141	148													
1993	101														
1994															
1995															
1996															
1997															
1998															
1999															
2000															
2001															
2002															
2003															
2004															
2005															
2006															
2007															
2008															

Age-to-Age Factors

First Exam Year	189 - 201	201 - 213	213 - 225	225 - 237	237 - 249	249 - 261	261 - 273	273 - 285	285 - 297	297 - 309	309 - 321	321 - 333	333 - 345	345 - 357	To Ult
Prior	1.028	1.027	1.024	1.014	1.012	1.008	1.006	1.004	1.004	1.002	1.006	1.004	1.002	1.002	
1979	1.056	1.035	1.000	1.000	1.034	1.000	1.000	1.016	1.000	1.000	1.000	1.000	1.000	1.000	
1980	1.000	1.043	1.041	1.020	1.000	1.019	1.019	1.000	1.000	1.019	1.000	1.000	1.000		
1981	1.020	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.019	1.000	1.000	1.000			
1982	1.043	1.020	1.040	1.000	1.019	1.000	1.038	1.000	1.000	1.018	1.000				
1983	1.024	1.024	1.000	1.070	1.022	1.021	1.000	1.000	1.000	1.000					
1984	1.000	1.034	1.000	1.016	1.016	1.000	1.000	1.000	1.000						
1985	1.041	1.039	1.000	1.000	1.025	1.012	1.000	1.000							
1986	1.020	1.020	1.020	1.010	1.010	1.019	1.000								
1987	1.105	1.052	1.082	1.023	1.022	1.007									
1988	1.072	1.017	1.050	1.000	1.024										
1989	1.031	1.036	1.011	1.006											
1990	1.033	1.011	1.016												
1991	1.034	1.026													
1992	1.050														
1993															
1994															
1995															
1996															
1997															
1998															
1999															
2000															
2001															
2002															
2003															
2004															
2005															
2006															
2007															
2008															

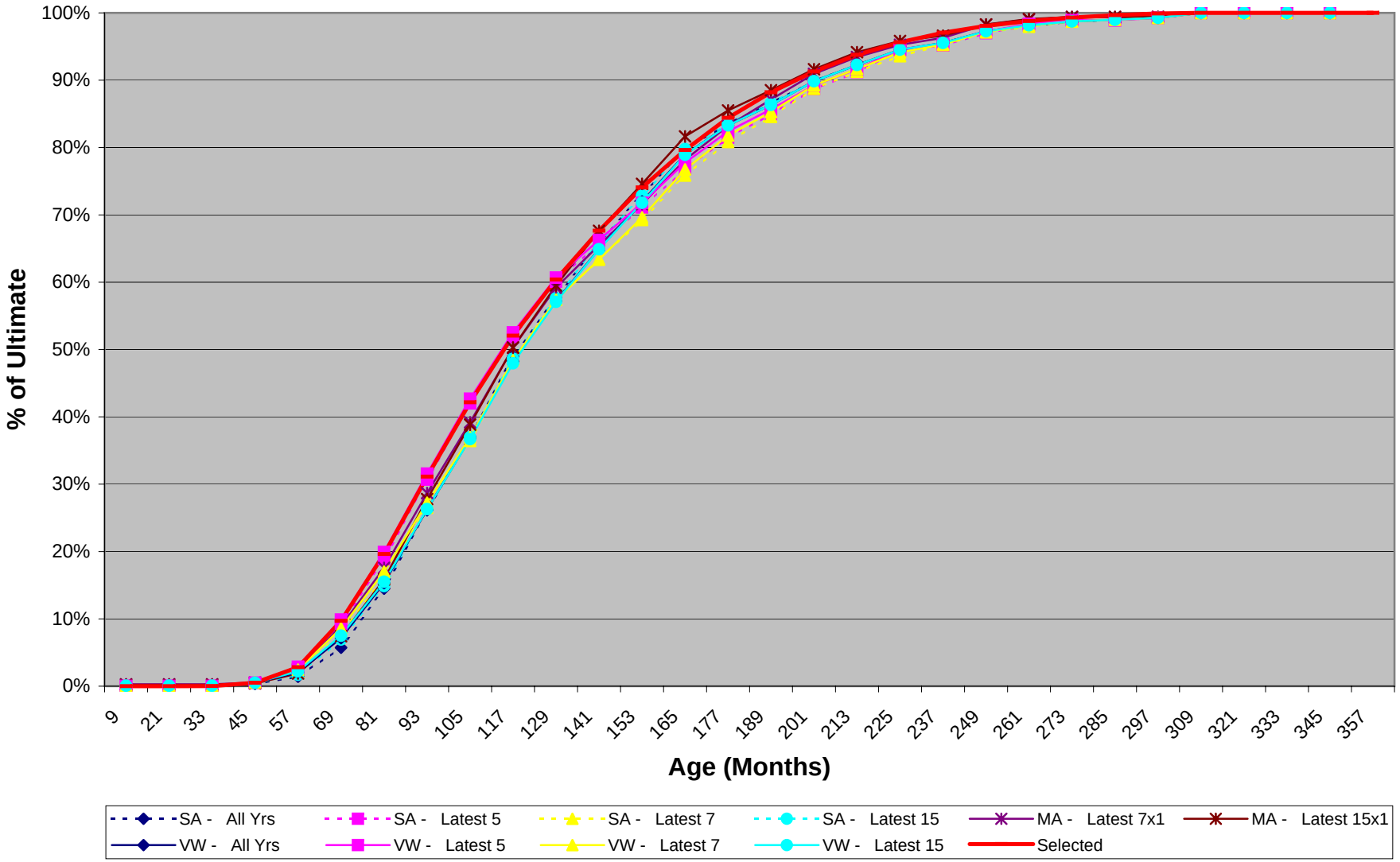
Averages

	189 - 201	201 - 213	213 - 225	225 - 237	237 - 249	249 - 261	261 - 273	273 - 285	285 - 297	297 - 309	309 - 321	321 - 333	333 - 345	345 - 357	To Ult
Simple Avg															
All Yrs	1.038	1.027	1.022	1.013	1.017	1.009	1.007	1.002	1.003	1.007	1.000	1.000	1.000	1.000	
Latest 5	1.044	1.028	1.036	1.008	1.019	1.012	1.008	1.000	1.004	1.007	1.000	1.000	1.000	1.000	
Latest 7	1.049	1.029	1.025	1.018	1.020	1.009	1.008	1.002	1.003	1.007	1.000	1.000	1.000	1.000	
Latest 15	1.038	1.027	1.022	1.013	1.017	1.009	1.007	1.002	1.003	1.007	1.000	1.000	1.000	1.000	
Medial Avg															
Latest 7x1	1.044	1.028	1.019	1.011	1.021	1.008	1.004	1.000	1.000	1.006	1.000	1.000	1.000	1.000	
Latest 15x1	1.035	1.028	1.018	1.008	1.017	1.008	1.003	1.000	1.000	1.006	1.000	1.000	1.000	1.000	
Volume Wtd															
All Yrs	1.041	1.027	1.024	1.011	1.018	1.009	1.006	1.002	1.003	1.007	1.000	1.000	1.000	1.000	
Latest 5	1.042	1.027	1.032	1.008	1.020	1.011	1.006	1.000	1.004	1.007	1.000	1.000	1.000	1.000	
Latest 7	1.046	1.027	1.027	1.012	1.020	1.009	1.007	1.002	1.003	1.007	1.000	1.000	1.000	1.000	
Latest 15	1.041	1.027	1.024	1.011	1.018	1.009	1.006	1.002	1.003	1.007	1.000	1.000	1.000	1.000	

Development Factor Selection

	189 - 201	201 - 213	213 - 225	225 - 237	237 - 249	249 - 261	261 - 273	273 - 285	285 - 297	297 - 309	309 - 321	321 - 333	333 - 345	345 - 357	To Ult
Prior Selected	1.030	1.025	1.020	1.015	1.030										
User Selected	1.035	1.027	1.020	1.015	1.010	1.007	1.005	1.004	1.002	1.001	1.000	1.000	1.000	1.000	1.000
Selected Result	1.035	1.027	1.020	1.015	1.010	1.007	1.005	1.004	1.002	1.001	1.000	1.000	1.000	1.000	1.000
FacToUlt	1.134	1.095	1.067	1.046	1.030	1.020	1.012	1.007	1.004	1.001	1.000	1.000	1.000	1.000	1.000
Percent of Ult	0.882	0.913	0.938	0.956	0.971	0.981	0.988	0.993	0.997	0.999	1.000	1.000	1.000	1.000	1.000

FCAS Count: Development Pattern



CAS 2008 Travel Time Report

ACAS Membership Development Triangle

ACAS Count

First Exam Year	9	21	33	45	57	69	81	93	105	117	129	141	153	165	177
Prior	0	12	48	126	229	317	383	444	490	534	571	590	607	624	635
1979	0	0	0	4	9	19	29	44	54	58	63	67	70	70	71
1980	0	0	0	0	3	14	24	30	39	49	53	56	59	61	62
1981	0	1	2	3	11	21	35	43	51	56	57	59	61	62	62
1982	0	0	0	0	8	20	30	39	45	55	60	60	64	68	68
1983	0	0	0	2	7	15	25	37	48	55	59	65	67	68	68
1984	0	0	1	5	9	20	42	53	60	71	76	79	81	81	83
1985	0	0	0	3	18	36	49	65	77	88	94	99	102	106	110
1986	0	0	0	4	19	45	67	83	111	124	131	131	134	140	145
1987	0	0	0	6	27	47	74	104	121	143	156	161	171	182	186
1988	0	0	0	9	21	47	73	99	121	134	146	156	165	168	173
1989	0	0	0	8	23	59	91	137	171	188	212	225	229	237	242
1990	0	0	0	8	34	71	106	146	171	197	219	234	244	249	258
1991	0	0	0	6	17	40	78	110	146	170	181	192	202	210	214
1992	0	0	0	5	23	50	83	114	135	148	161	176	184	191	199
1993	0	0	1	5	18	26	48	72	81	87	106	117	123	129	130
1994	0	1	1	3	12	26	40	58	80	93	106	112	123	126	131
1995	0	0	1	1	8	25	41	60	72	85	92	100	105	110	
1996	0	0	2	6	15	27	48	61	69	80	90	93	94		
1997	0	0	1	3	19	35	55	72	87	100	107	110			
1998	0	0	0	5	12	23	34	50	68	73	76				
1999	0	0	2	3	8	26	46	62	65	65					
2000	0	0	1	6	19	43	71	117	165						
2001	0	0	0	9	38	77	114	149							
2002	0	0	0	20	69	116	161								
2003	0	0	1	15	44	91									
2004	0	0	3	17	55										
2005	0	0	19	60											
2006	0	0	1												
2007	0	0													
2008	0														

Age-to-Age Factors

First Exam Year	9 - 21	21 - 33	33 - 45	45 - 57	57 - 69	69 - 81	81 - 93	93 - 105	105 - 117	117 - 129	129 - 141	141 - 153	153 - 165	165 - 177	177 - 189
Prior		4.000	2.625	1.817	1.384	1.208	1.159	1.104	1.090	1.069	1.033	1.029	1.028	1.018	1.009
1979				2.250	2.111	1.526	1.517	1.227	1.074	1.086	1.063	1.045	1.000	1.014	1.028
1980					4.667	1.714	1.250	1.300	1.256	1.082	1.057	1.054	1.034	1.016	1.016
1981		2.000	1.500	3.667	1.909	1.667	1.229	1.186	1.098	1.018	1.035	1.034	1.016	1.000	1.016
1982					2.500	1.500	1.300	1.154	1.222	1.091	1.000	1.067	1.063	1.000	1.015
1983				3.500	2.143	1.667	1.480	1.297	1.146	1.073	1.102	1.031	1.015	1.000	1.044
1984			5.000	1.800	2.222	2.100	1.262	1.132	1.183	1.070	1.039	1.025	1.000	1.025	1.000
1985				6.000	2.000	1.361	1.327	1.185	1.143	1.068	1.053	1.030	1.039	1.038	1.036
1986				4.750	2.368	1.489	1.239	1.337	1.117	1.056	1.000	1.023	1.045	1.036	1.000
1987				4.500	1.741	1.574	1.405	1.163	1.182	1.091	1.032	1.062	1.064	1.022	1.038
1988				2.333	2.238	1.553	1.356	1.222	1.107	1.090	1.068	1.058	1.018	1.030	1.023
1989				2.875	2.565	1.542	1.505	1.248	1.099	1.128	1.061	1.018	1.035	1.021	1.012
1990				4.250	2.088	1.493	1.377	1.171	1.152	1.112	1.068	1.043	1.020	1.036	1.023
1991				2.833	2.353	1.950	1.410	1.327	1.164	1.065	1.061	1.052	1.040	1.019	1.028
1992				4.600	2.174	1.660	1.373	1.184	1.096	1.088	1.093	1.045	1.038	1.042	1.020
1993			5.000	3.600	1.444	1.846	1.500	1.125	1.074	1.218	1.104	1.051	1.049	1.008	1.008
1994		1.000	3.000	4.000	2.167	1.538	1.450	1.379	1.163	1.140	1.057	1.098	1.024	1.040	
1995			1.000	8.000	3.125	1.640	1.463	1.200	1.181	1.082	1.087	1.050	1.048		
1996			3.000	2.500	1.800	1.778	1.271	1.131	1.159	1.125	1.033	1.011			
1997			3.000	6.333	1.842	1.571	1.309	1.208	1.149	1.070	1.028				
1998				2.400	1.917	1.478	1.471	1.360	1.074	1.041					
1999			1.500	2.667	3.250	1.769	1.348	1.048	1.000						
2000			6.000	3.167	2.263	1.651	1.648	1.410							
2001				4.222	2.026	1.481	1.307								
2002				3.450	1.681	1.388									
2003			15.000	2.933	2.068										
2004			5.667	3.235											
2005			3.158												
2006															
2007															
2008															

Averages

	9 - 21	21 - 33	33 - 45	45 - 57	57 - 69	69 - 81	81 - 93	93 - 105	105 - 117	117 - 129	129 - 141	141 - 153	153 - 165	165 - 177	177 - 189
Simple Avg															
All Yrs		1.500	4.402	3.744	2.267	1.622	1.383	1.227	1.135	1.090	1.055	1.044	1.032	1.022	1.021
Latest 5		1.000	7.942	3.402	2.258	1.553	1.416	1.232	1.113	1.092	1.062	1.051	1.040	1.029	1.018
Latest 7		1.000	6.265	3.153	2.150	1.588	1.402	1.248	1.114	1.109	1.066	1.050	1.036	1.028	1.022
Latest 15		1.500	4.632	3.879	2.184	1.623	1.413	1.234	1.124	1.096	1.059	1.044	1.034	1.022	1.021
Medial Avg															
Latest 7x1		1.000	4.942	3.090	2.023	1.590	1.380	1.256	1.124	1.101	1.066	1.048	1.037	1.029	1.021
Latest 15x1		1.500	3.791	3.676	2.159	1.616	1.406	1.235	1.129	1.091	1.060	1.043	1.035	1.022	1.020
Volume Wtd															
All Yrs		1.500	3.629	3.429	2.075	1.578	1.385	1.230	1.132	1.093	1.057	1.044	1.034	1.025	1.021
Latest 5		1.000	4.000	3.358	1.983	1.495	1.406	1.254	1.116	1.093	1.062	1.052	1.039	1.030	1.019
Latest 7		1.000	3.885	3.267	1.967	1.524	1.396	1.263	1.117	1.108	1.068	1.050	1.035	1.028	1.022
Latest 15		1.500	3.719	3.491	2.047	1.576	1.408	1.236	1.127	1.097	1.059	1.044	1.035	1.026	1.021

Development Factor Selection

	9 - 21	21 - 33	33 - 45	45 - 57	57 - 69	69 - 81	81 - 93	93 - 105	105 - 117	117 - 129	129 - 141	141 - 153	153 - 165	165 - 177	177 - 189
Prior Selected	3.000	3.743	6.550	2.295	1.519	1.375	1.285	1.172	1.120	1.075	1.052	1.036	1.027	1.020	1.015
Selected		1.500	4.500	3.360	1.985	1.590	1.380	1.235	1.132	1.090	1.070	1.048	1.037	1.029	1.019
Selected Result		1.500	4.500	3.360	1.985	1.590	1.380	1.235	1.132	1.090	1.070	1.048	1.037	1.029	1.019
FacToUlt		191.962	127.975	28.439	8.464	4.264	2.682	1.944	1.574	1.390	1.275	1.192	1.137	1.097	1.066
Percent of Ult		0.5%	0.8%	3.5%	11.8%	23.5%	37.3%	51.4%	63.5%	71.9%	78.4%	83.9%	87.9%	91.2%	93.8%

CAS 2008 Travel Time Report

ACAS Membership Development Triangle

ACAS Count

First Exam Year	189	201	213	225	237	249	261	273	285	297	309	321	333	345	357
Prior	641	648	660	670	681	685	688	690	691	693	695	696	696	698	699
1979	73	73	74	74	75	75	75	75	75	75	75	75	75	75	75
1980	63	63	65	65	65	65	65	66	66	66	66	66	66	66	
1981	63	63	64	65	65	65	65	65	65	65	65	65	65		
1982	69	69	69	69	70	71	71	71	72	72	72	72			
1983	71	71	71	72	74	74	74	77	77	77	77				
1984	83	83	83	83	84	84	85	85	85	85					
1985	114	114	114	115	115	115	115	115	115						
1986	145	146	146	147	147	147	147	147							
1987	193	201	206	208	213	213	214								
1988	177	184	184	187	187	187									
1989	245	252	256	259	260										
1990	264	267	270	270											
1991	220	223	223												
1992	203	203													
1993	131														
1994															
1995															
1996															
1997															
1998															
1999															
2000															
2001															
2002															
2003															
2004															
2005															
2006															
2007															
2008															

Age-to-Age Factors

First Exam Year	189 - 201	201 - 213	213 - 225	225 - 237	237 - 249	249 - 261	261 - 273	273 - 285	285 - 297	297 - 309	309 - 321	321 - 333	333 - 345	345 - 357	To Ult
Prior	1.011	1.019	1.015	1.016	1.006	1.004	1.003	1.001	1.003	1.003	1.001	1.000	1.003	1.001	
1979	1.000	1.014	1.000	1.014	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
1980	1.000	1.032	1.000	1.000	1.000	1.000	1.015	1.000	1.000	1.000	1.000	1.000	1.000		
1981	1.000	1.016	1.016	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000			
1982	1.000	1.000	1.000	1.014	1.014	1.000	1.000	1.014	1.000	1.000	1.000				
1983	1.000	1.000	1.014	1.028	1.000	1.000	1.041	1.000	1.000	1.000					
1984	1.000	1.000	1.000	1.012	1.000	1.012	1.000	1.000	1.000						
1985	1.000	1.000	1.009	1.000	1.000	1.000	1.000	1.000							
1986	1.007	1.000	1.007	1.000	1.000	1.000	1.000								
1987	1.041	1.025	1.010	1.024	1.000	1.005									
1988	1.040	1.000	1.016	1.000	1.000										
1989	1.029	1.016	1.012	1.004											
1990	1.011	1.011	1.000												
1991	1.014	1.000													
1992	1.000														
1993															
1994															
1995															
1996															
1997															
1998															
1999															
2000															
2001															
2002															
2003															
2004															
2005															
2006															
2007															
2008															

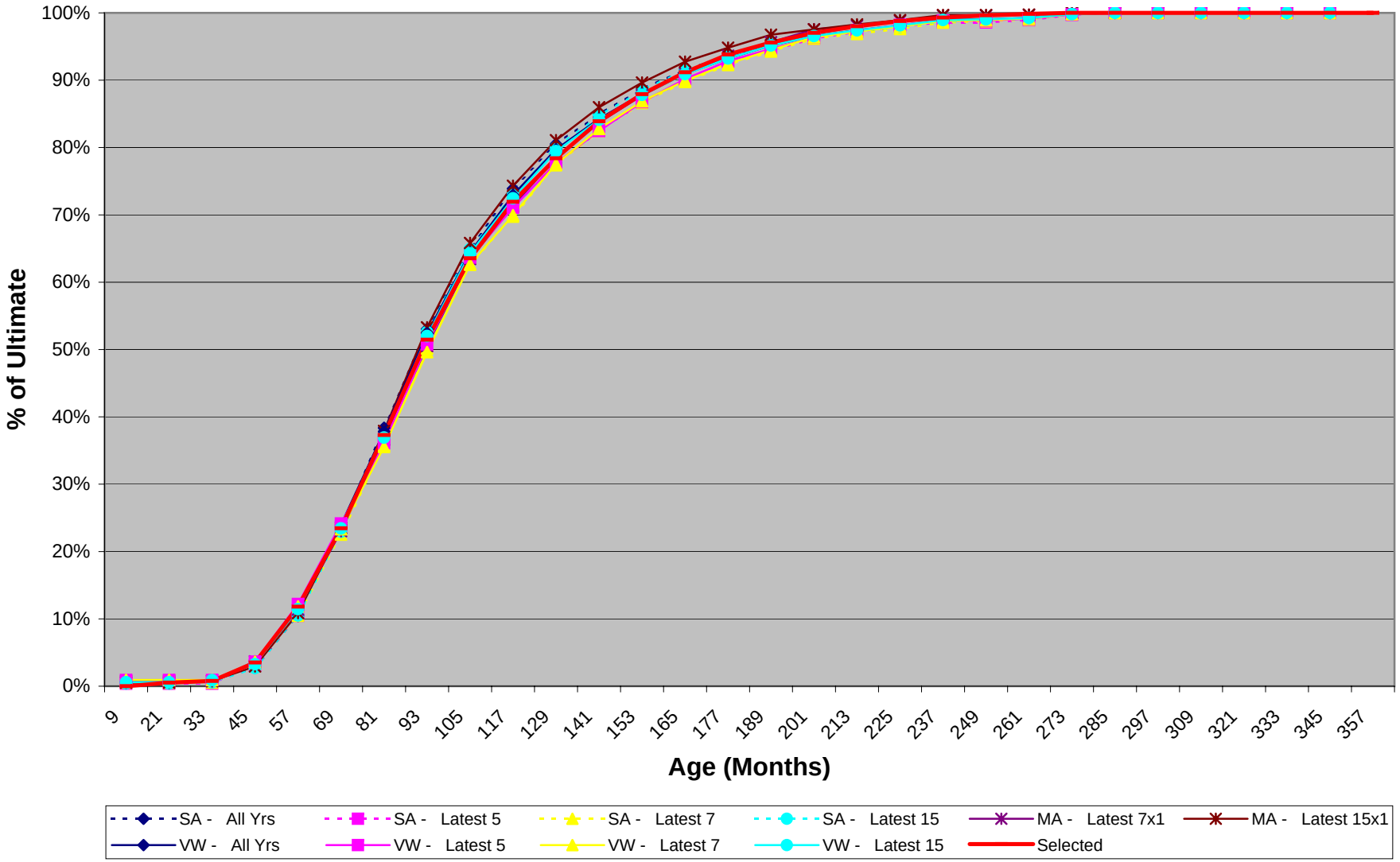
Averages

	189 - 201	201 - 213	213 - 225	225 - 237	237 - 249	249 - 261	261 - 273	273 - 285	285 - 297	297 - 309	309 - 321	321 - 333	333 - 345	345 - 357	To Ult
Simple Avg															
All Yrs	1.010	1.009	1.007	1.009	1.001	1.002	1.007	1.002	1.000	1.000	1.000	1.000	1.000	1.000	
Latest 5	1.019	1.010	1.009	1.006	1.000	1.003	1.008	1.003	1.000	1.000	1.000	1.000	1.000	1.000	
Latest 7	1.020	1.007	1.008	1.010	1.002	1.002	1.008	1.002	1.000	1.000	1.000	1.000	1.000	1.000	
Latest 15	1.010	1.009	1.007	1.009	1.001	1.002	1.007	1.002	1.000	1.000	1.000	1.000	1.000	1.000	
Medial Avg															
Latest 7x1	1.020	1.005	1.007	1.008	1.000	1.001	1.003	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
Latest 15x1	1.008	1.007	1.007	1.008	1.000	1.001	1.003	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
Volume Wtd															
All Yrs	1.015	1.009	1.007	1.008	1.001	1.002	1.006	1.002	1.000	1.000	1.000	1.000	1.000	1.000	
Latest 5	1.018	1.011	1.008	1.007	1.000	1.003	1.006	1.002	1.000	1.000	1.000	1.000	1.000	1.000	
Latest 7	1.020	1.009	1.008	1.008	1.001	1.003	1.006	1.002	1.000	1.000	1.000	1.000	1.000	1.000	
Latest 15	1.015	1.009	1.007	1.008	1.001	1.002	1.006	1.002	1.000	1.000	1.000	1.000	1.000	1.000	

Development Factor Selection

	189 - 201	201 - 213	213 - 225	225 - 237	237 - 249	249 - 261	261 - 273	273 - 285	285 - 297	297 - 309	309 - 321	321 - 333	333 - 345	345 - 357	To Ult
Prior Selected	1.012	1.009	1.006	1.006	1.020										
Selected	1.015	1.010	1.008	1.005	1.003	1.002	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Selected Result	1.015	1.010	1.008	1.005	1.003	1.002	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
FacToUlt	1.046	1.031	1.020	1.012	1.007	1.004	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Percent of Ult	95.6%	97.0%	98.0%	98.8%	99.3%	99.6%	99.9%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

ACAS Count: Development Pattern



CAS Candidate Count

First Exam Year	9	21	33	45	57	69	81	93	105	117	129	141	153	165	177
Prior	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	776
1994	0	0	0	0	0	0	0	0	0	0	0	0	0	706	706
1995	0	0	0	0	0	0	0	0	0	0	0	0	655	656	
1996	0	0	0	0	0	0	0	0	0	0	0	522	522		
1997	0	0	0	0	0	0	0	0	0	0	525	525			
1998	0	0	0	0	0	0	0	0	0	314	314				
1999	0	0	0	0	0	0	0	0	116	116					
2000	0	0	0	0	0	0	0	827	838						
2001	0	0	0	0	0	0	531	536							
2002	0	0	0	0	0	679	685								
2003	0	0	0	0	687	698									
2004	0	0	0	685	727										
2005	0	0	1,342	1,397											
2006	0	1,079	1,197												
2007	525	912													
2008	445														

Age-to-Age Factors

First Exam Year	9 - 21	21 - 33	33 - 45	45 - 57	57 - 69	69 - 81	81 - 93	93 - 105	105 - 117	117 - 129	129 - 141	141 - 153	153 - 165	165 - 177	177 - 189
Prior															
1979															
1980															
1981															
1982															
1983															
1984															
1985															
1986															
1987															
1988															
1989															
1990															
1991															
1992															
1993															1.000
1994														1.000	
1995													1.002		
1996												1.000			
1997											1.000				
1998										1.000					
1999									1.000						
2000								1.013							
2001							1.009								
2002						1.009									
2003					1.016										
2004				1.061											
2005			1.041												
2006		1.109													
2007	1.737														
2008															

Averages

	9 - 21	21 - 33	33 - 45	45 - 57	57 - 69	69 - 81	81 - 93	93 - 105	105 - 117	117 - 129	129 - 141	141 - 153	153 - 165	165 - 177	177 - 189
Simple Avg															
All Yrs	1.737	1.109	1.041	1.061	1.016	1.009	1.009	1.013	1.000	1.000	1.000	1.000	1.002	1.000	1.000
Latest 5	1.737	1.109	1.041	1.061	1.016	1.009	1.009	1.013	1.000	1.000	1.000	1.000	1.002	1.000	1.000
Latest 7	1.737	1.109	1.041	1.061	1.016	1.009	1.009	1.013	1.000	1.000	1.000	1.000	1.002	1.000	1.000
Latest 15	1.737	1.109	1.041	1.061	1.016	1.009	1.009	1.013	1.000	1.000	1.000	1.000	1.002	1.000	1.000
Medial Avg															
Latest 7x1	1.737	1.109	1.041	1.061	1.016	1.009	1.009	1.013	1.000	1.000	1.000	1.000	1.002	1.000	1.000
Latest 15x1	1.737	1.109	1.041	1.061	1.016	1.009	1.009	1.013	1.000	1.000	1.000	1.000	1.002	1.000	1.000
Volume Wtd															
All Yrs	1.737	1.109	1.041	1.061	1.016	1.009	1.009	1.013	1.000	1.000	1.000	1.000	1.002	1.000	1.000
Latest 5	1.737	1.109	1.041	1.061	1.016	1.009	1.009	1.013	1.000	1.000	1.000	1.000	1.002	1.000	1.000
Latest 7	1.737	1.109	1.041	1.061	1.016	1.009	1.009	1.013	1.000	1.000	1.000	1.000	1.002	1.000	1.000
Latest 15	1.737	1.109	1.041	1.061	1.016	1.009	1.009	1.013	1.000	1.000	1.000	1.000	1.002	1.000	1.000

Development Factor Selection

	9 - 21	21 - 33	33 - 45	45 - 57	57 - 69	69 - 81	81 - 93	93 - 105	105 - 117	117 - 129	129 - 141	141 - 153	153 - 165	165 - 177	177 - 189
Prior Selected	1.326	1.017	1.153	1.093	1.065	1.021	1.051	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
User Selected	1.750	1.110	1.060	1.040	1.025	1.015	1.010	1.007	1.005	1.003	1.002	1.002	1.001	1.001	1.001
Selected Result	1.750	1.110	1.060	1.040	1.025	1.015	1.010	1.007	1.005	1.003	1.002	1.002	1.001	1.001	1.001
FacToUlt	2.300	1.314	1.184	1.117	1.074	1.048	1.032	1.022	1.015	1.010	1.007	1.004	1.003	1.001	1.001
Percent of Ult	0.435	0.761	0.845	0.895	0.931	0.954	0.969	0.978	0.985	0.990	0.993	0.996	0.997	0.999	0.999

CAS 2008 Travel Time Report

CAS Candidate Development Triangle

CAS Candidate Count

First Exam Year	189	201	213	225	237	249	261	273	285	297	309	321	333	345	357
Prior	0	0	0	0	0	0	0	0	0	0	0	0	0	0	846
1979	0	0	0	0	0	0	0	0	0	0	0	0	0	101	101
1980	0	0	0	0	0	0	0	0	0	0	0	0	85	85	
1981	0	0	0	0	0	0	0	0	0	0	0	85	85		
1982	0	0	0	0	0	0	0	0	0	0	103	104			
1983	0	0	0	0	0	0	0	0	0	108	108				
1984	0	0	0	0	0	0	0	0	129	129					
1985	0	0	0	0	0	0	0	214	214						
1986	0	0	0	0	0	0	299	299							
1987	0	0	0	0	0	455	455								
1988	0	0	0	0	499	500									
1989	0	0	0	720	720										
1990	0	0	919	919											
1991	0	895	895												
1992	879	880													
1993	776														
1994															
1995															
1996															
1997															
1998															
1999															
2000															
2001															
2002															
2003															
2004															
2005															
2006															
2007															
2008															

Age-to-Age Factors

First Exam Year	189 - 201	201 - 213	213 - 225	225 - 237	237 - 249	249 - 261	261 - 273	273 - 285	285 - 297	297 - 309	309 - 321	321 - 333	333 - 345	345 - 357	To Ult
Prior															
1979														1.000	
1980													1.000		
1981												1.000			
1982											1.010				
1983										1.000					
1984									1.000						
1985								1.000							
1986							1.000								
1987						1.000									
1988					1.002										
1989				1.000											
1990			1.000												
1991		1.000													
1992	1.001														
1993															
1994															
1995															
1996															
1997															
1998															
1999															
2000															
2001															
2002															
2003															
2004															
2005															
2006															
2007															
2008															

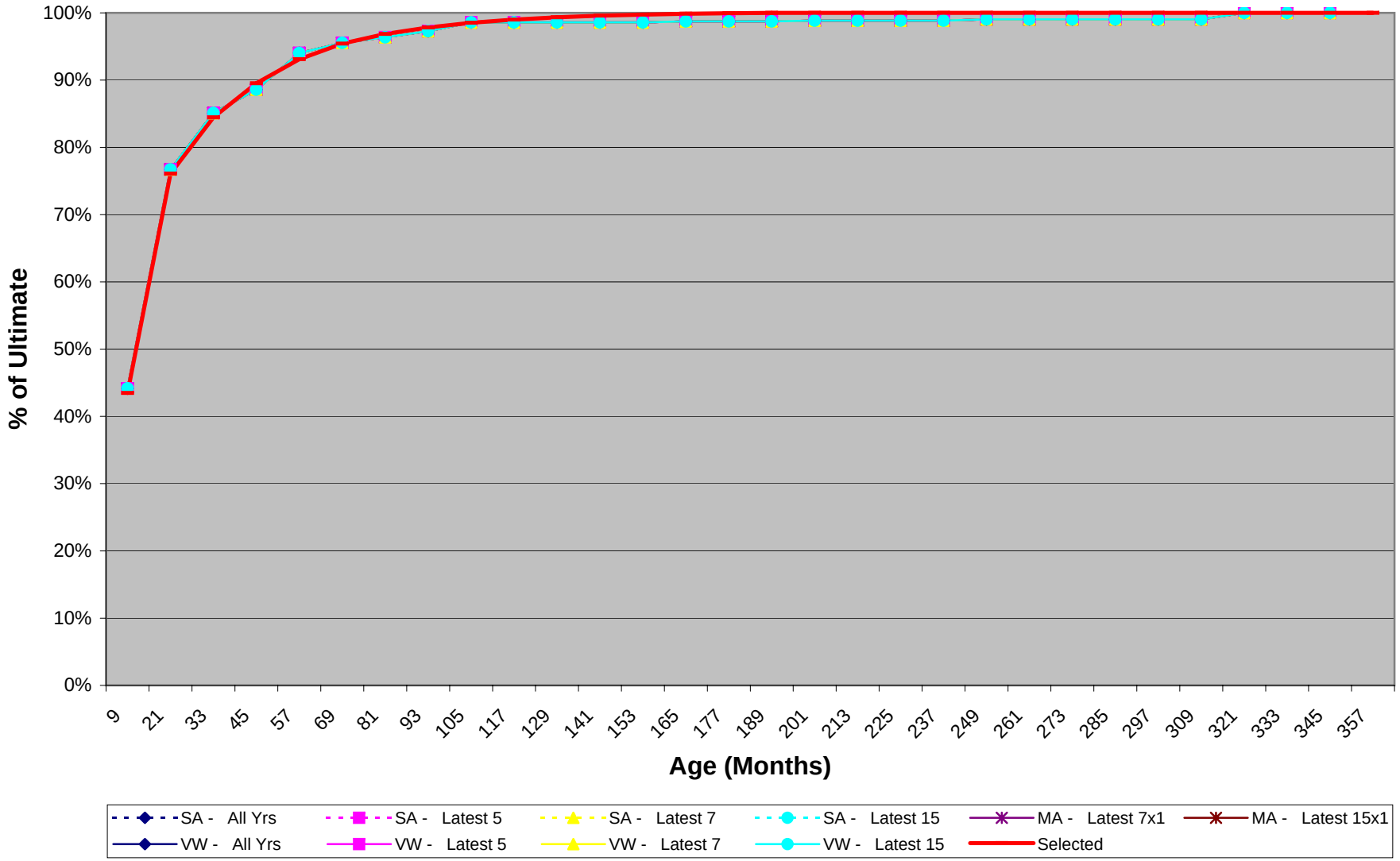
Averages

	189 - 201	201 - 213	213 - 225	225 - 237	237 - 249	249 - 261	261 - 273	273 - 285	285 - 297	297 - 309	309 - 321	321 - 333	333 - 345	345 - 357	To Ult
Simple Avg															
All Yrs	1.001	1.000	1.000	1.000	1.002	1.000	1.000	1.000	1.000	1.000	1.010	1.000	1.000	1.000	
Latest 5	1.001	1.000	1.000	1.000	1.002	1.000	1.000	1.000	1.000	1.000	1.010	1.000	1.000	1.000	
Latest 7	1.001	1.000	1.000	1.000	1.002	1.000	1.000	1.000	1.000	1.000	1.010	1.000	1.000	1.000	
Latest 15	1.001	1.000	1.000	1.000	1.002	1.000	1.000	1.000	1.000	1.000	1.010	1.000	1.000	1.000	
Medial Avg															
Latest 7x1	1.001	1.000	1.000	1.000	1.002	1.000	1.000	1.000	1.000	1.000	1.010	1.000	1.000	1.000	
Latest 15x1	1.001	1.000	1.000	1.000	1.002	1.000	1.000	1.000	1.000	1.000	1.010	1.000	1.000	1.000	
Volume Wtd															
All Yrs	1.001	1.000	1.000	1.000	1.002	1.000	1.000	1.000	1.000	1.000	1.010	1.000	1.000	1.000	
Latest 5	1.001	1.000	1.000	1.000	1.002	1.000	1.000	1.000	1.000	1.000	1.010	1.000	1.000	1.000	
Latest 7	1.001	1.000	1.000	1.000	1.002	1.000	1.000	1.000	1.000	1.000	1.010	1.000	1.000	1.000	
Latest 15	1.001	1.000	1.000	1.000	1.002	1.000	1.000	1.000	1.000	1.000	1.010	1.000	1.000	1.000	

Development Factor Selection

	189 - 201	201 - 213	213 - 225	225 - 237	237 - 249	249 - 261	261 - 273	273 - 285	285 - 297	297 - 309	309 - 321	321 - 333	333 - 345	345 - 357	To Ult
Prior Selected	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
User Selected	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Selected Result	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
FacToUlt	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Percent of Ult	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

CAS Candidate Count: Development Pattern



APPENDIX B: ADDITIONAL STATISTICS

Appendix B contains additional statistics, updated to include results through the May 2008 exam sessions, along with supporting text. Specifically, this appendix includes:

- Median travel times for starting cohorts;
- Percentage completion for starting cohorts (including Fisher Statistics); and
- Travel times by candidate starting age (Schwartz Statistics).

As the data prior to 1970 are very sparse, we exclude this information from the tables in Appendix B.

MEDIAN TRAVEL TIMES FOR STARTING COHORTS

In order to remove some of the distortions inherent in the statistics representing average travel times for graduating classes caused by the skewed distribution of travel times, a new set of statistics was created in 2002. These statistics group members by year of first employment ("starting cohort") and compute median, rather than mean, travel times for each group. Additionally, medians are computed for each starting cohort, truncated at each of five and ten years.

Median travel times for starting cohorts are shown graphically in Chart B.1 with accompanying data in Table B.1.

Chart B.1

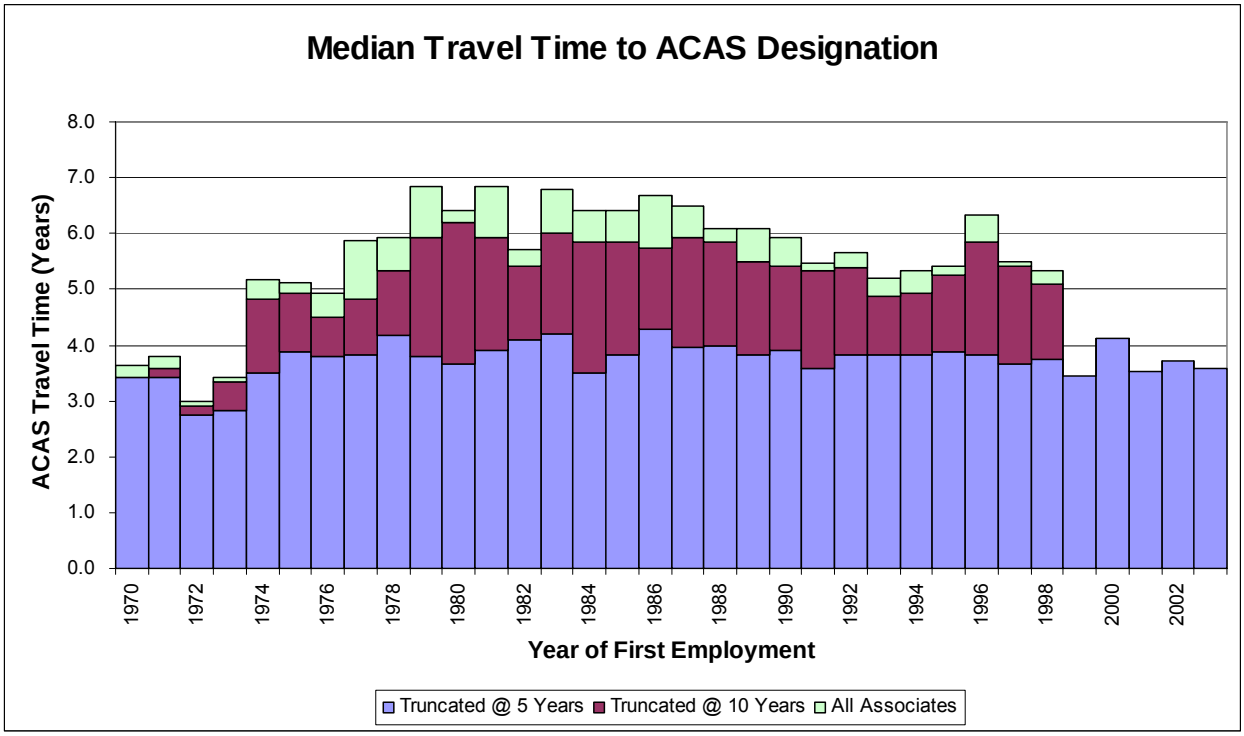


Table B.1

Travel Time Statistics for Associates: Median Travel Time (Years) for Starting Cohorts							
	All Candidates (No Truncation)			Truncated @ 5 Years		Truncated @ 10 Years	
Year of First Employment	Number of Candidates	Number of Associates	Median Travel Time	Number of Associates	Median Travel Time	Number of Associates	Median Travel Time
1970	28	28	3.63	23	3.42	23	3.42
1971	43	42	3.79	34	3.42	39	3.58
1972	54	54	3.00	43	2.75	50	2.92
1973	66	66	3.42	45	2.83	60	3.33
1974	49	49	5.17	24	3.50	43	4.83
1975	52	50	5.13	26	3.88	46	4.92
1976	69	68	4.92	36	3.79	57	4.50
1977	74	74	5.88	34	3.83	61	4.83
1978	85	82	5.92	34	4.17	71	5.33
1979	99	96	6.83	26	3.79	72	5.92
1980	81	81	6.42	25	3.67	72	6.21
1981	73	69	6.83	21	3.92	59	5.92
1982	72	70	5.71	27	4.08	63	5.42
1983	77	72	6.79	20	4.21	59	6.00
1984	86	81	6.42	26	3.50	65	5.83
1985	84	82	6.42	26	3.83	68	5.83
1986	146	132	6.67	42	4.29	106	5.75
1987	194	178	6.50	64	3.96	144	5.92
1988	144	131	6.08	49	4.00	113	5.83
1989	200	179	6.08	59	3.83	140	5.50
1990	222	193	5.92	80	3.92	173	5.42
1991	186	162	5.46	70	3.58	147	5.33
1992	197	169	5.67	73	3.83	152	5.38
1993	185	166	5.21	79	3.83	148	4.88
1994	214	189	5.33	89	3.83	169	4.92
1995	164	119	5.42	54	3.88	111	5.25
1996	203	153	6.33	54	3.83	137	5.83
1997	189	129	5.50	53	3.67	120	5.42
1998	204	135	5.33	65	3.75	128	5.08
1999	173	95	5.58	40	3.46	95	5.58
2000	180	94	5.38	44	4.13	94	5.38
2001	251	103	4.83	60	3.54	103	4.83
2002	321	147	4.33	90	3.71	147	4.33
2003	392	164	3.88	135	3.58	164	3.88
2004	399	120	3.42	120	3.42	120	3.42
2005	379	89	3.08	89	3.08	89	3.08
2006	304	49	2.42	49	2.42	49	2.42
2007	170	8	1.46	8	1.46	8	1.46
2008	21	-	-	-	-	-	-

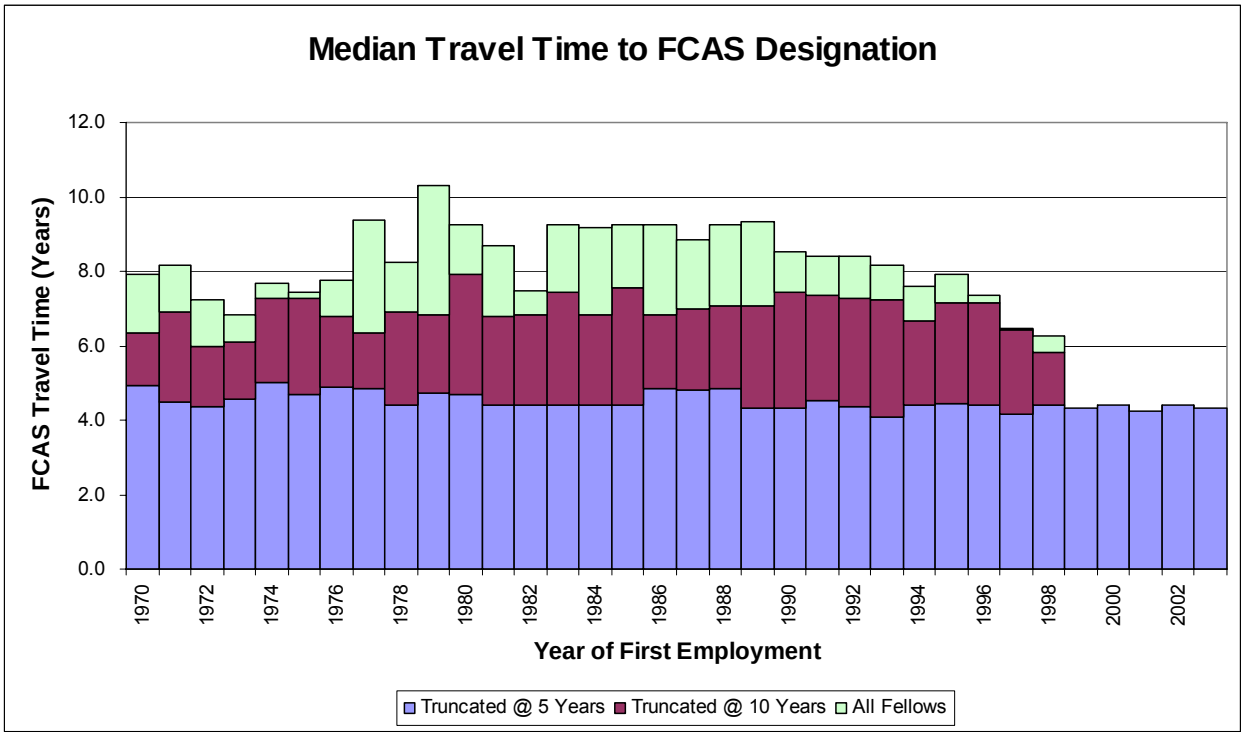
We note that the total number of candidates in recent year cohorts will increase over time since many candidates are unknown to the CAS until they enroll in their first CAS exam and many candidates are still

taking joint exams when they begin P&C employment. For example, in the 2007 Report, there were 305 candidates in the 2005 starting cohort versus 379 in the 2008 Report[2].

Travel time appears to have peaked in the late 1970s, following the transition in 1975 that increased the number of exams required for Associateship from five to seven. The transition to partitioned exams in 1990 does not appear to have increased travel time as had been previously feared. Statistics were included in previous reports that indicated that candidates sat for fewer exams following partitioning; this led many to conclude that partitioning increased travel time. However, we now question the interpretation of those statistics. New statistics, which were first included in the 2005 Report, provide evidence that exam partitioning may not have had a materially deleterious effect on candidate travel time[3]. Prior reports also included statistics on mean travel times for graduating classes. Those statistics were often cited as indicating sharp increases in travel time. The statistics, based on starting year and using median and earlier percentiles, do not show sharp increases.

The travel times to Fellowship are shown in Chart B.2 and Table B.2.

Chart B.2



[2] The 21 candidates in 2008 are expected to exceed 300 when the reporting is complete.

[3] See "Fisher Statistics" below.

Table B.2

Travel Time Statistics for Fellows: Median Travel Time (Years) for Starting Cohorts							
	All Candidates (No Truncation)			Truncated @ 5 Years		Truncated @ 10 Years	
Year of First Employment	Number of Candidates	Number of Fellows	Median Travel Time	Number of Fellows	Median Travel Time	Number of Fellows	Median Travel Time
1970	28	21	7.92	3	4.92	15	6.33
1971	43	39	8.17	3	4.50	28	6.92
1972	54	42	7.25	10	4.38	30	6.00
1973	66	49	6.83	9	4.58	38	6.08
1974	49	36	7.67	3	5.00	30	7.29
1975	52	39	7.42	7	4.67	28	7.29
1976	69	57	7.75	10	4.88	42	6.79
1977	74	52	9.38	9	4.83	31	6.33
1978	85	66	8.25	7	4.42	45	6.92
1979	99	76	10.29	8	4.71	38	6.83
1980	81	67	9.25	6	4.67	43	7.92
1981	73	50	8.67	5	4.42	30	6.79
1982	72	48	7.46	6	4.42	36	6.83
1983	77	53	9.25	4	4.42	31	7.42
1984	86	59	9.17	9	4.42	35	6.83
1985	84	55	9.25	3	4.42	36	7.54
1986	146	92	9.25	3	4.83	51	6.83
1987	194	121	8.83	12	4.79	68	7.00
1988	144	99	9.25	7	4.83	57	7.08
1989	200	123	9.33	15	4.33	71	7.08
1990	222	144	8.54	9	4.33	92	7.42
1991	186	121	8.42	10	4.54	80	7.33
1992	197	116	8.42	18	4.38	78	7.29
1993	185	127	8.17	15	4.08	96	7.25
1994	214	142	7.58	21	4.42	103	6.67
1995	164	92	7.92	10	4.46	72	7.17
1996	203	107	7.33	17	4.42	91	7.17
1997	189	94	6.46	22	4.17	87	6.42
1998	204	103	6.25	40	4.42	96	5.83
1999	173	58	6.29	18	4.33	58	6.29
2000	180	65	5.67	21	4.42	65	5.67
2001	251	73	5.33	33	4.25	73	5.33
2002	321	96	5.21	46	4.42	96	5.21
2003	392	108	4.75	70	4.33	108	4.75
2004	399	63	4.00	63	4.00	63	4.00
2005	379	41	3.42	41	3.42	41	3.42
2006	304	9	2.50	9	2.50	9	2.50
2007	170	1	1.83	1	1.83	1	1.83
2008	21	-	-	-	-	-	-

No clear trends appear as a result of the 1990 transition. The effect of the 2000 transition is not yet evident in the data. For the period from 1970 to 1993, the average median travel time is approximately 8.5 years. Of all classes from 1970 to present, only the class of 1973 succeeded in achieving a median travel time less than seven years. Travel times truncated at five and ten years have been relatively stable.

PERCENTAGE COMPLETION FOR STARTING COHORTS

Another method for analyzing travel time data is to look at the percentage of each cohort that reaches Associateship or Fellowship within a given number of years. This is a predictor of future direction in median travel time for starting cohorts. If greater numbers of candidates reach designations earlier, then the median travel times can be expected to decrease. If the percentage of candidates reaching designations at early points falls, median travel time can be expected to increase. This statistic is heavily influenced by the recording of date of first employment.

The CAS database extract provided for the 2008 Report contains records for approximately 19,000 individuals. Of these, only 6,162 have recorded employment dates. Date of first employment is now required for all candidates registering for exams[4]. For candidates that dropped out of the exam system prior to the capture of this data element, there is no cost effective means available to capture their employment dates. These candidates are therefore not included in the population. The exclusion of these candidates causes the completion percentages for early years to be inflated. The inclusion of these candidates going forward will cause percentages to fall. Data prior to 1980 was removed as it is not meaningful. We also note that prior to 1990, the number of candidates may be understated.

Chart B.3 and Table B.3 summarize the results for Associates, and Chart B.4 and Table B.4 present the results for Fellows. Cells shaded in gray are not fully mature in the tables.

Recent trends are encouraging, particularly with regard to the percentage of starting cohorts achieving Fellowship within five years. The most recent results are likely due to efforts to improve the exam process in the early 2000s. It is notable, however, that the percentage of candidates achieving Fellowship within five years is still less than 20%, and the percentage achieving Fellowship within ten years is less than 50%. It will be difficult to achieve a median travel time of five to seven years under these circumstances.

[4] The registration form asks for this information, however not all candidates complete this field.

Chart B.3

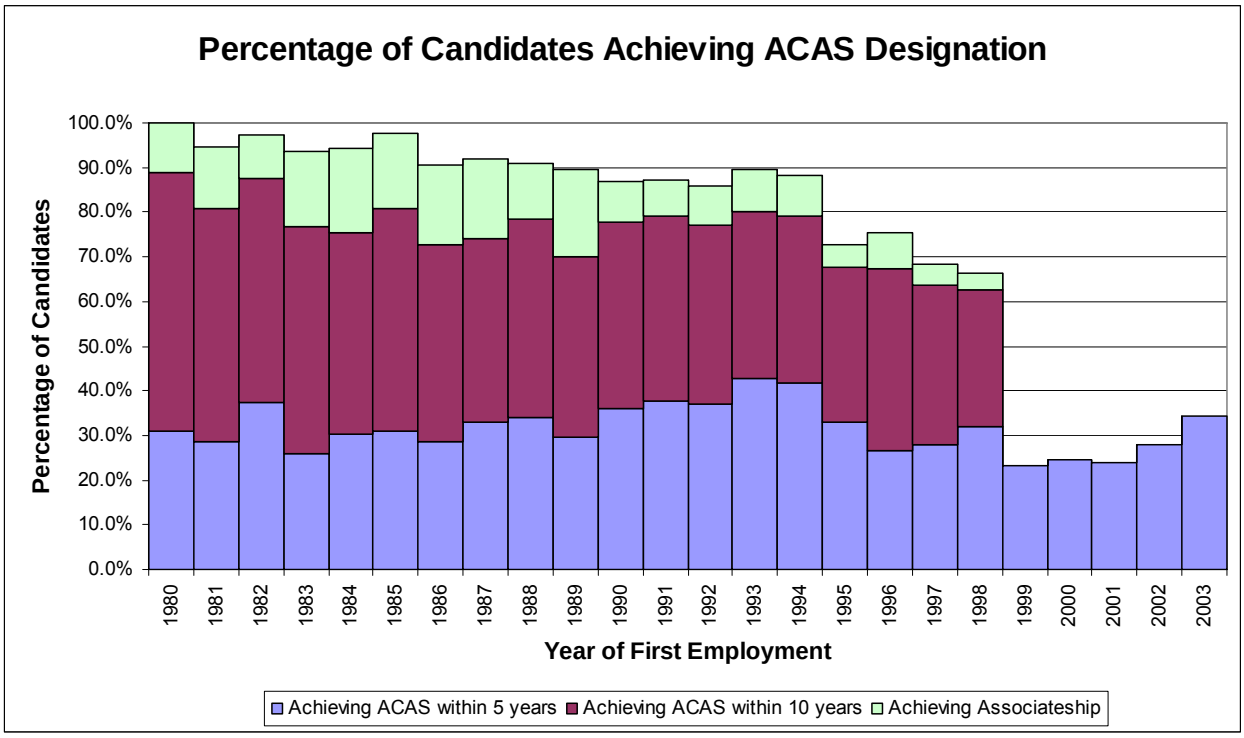


Chart B.4

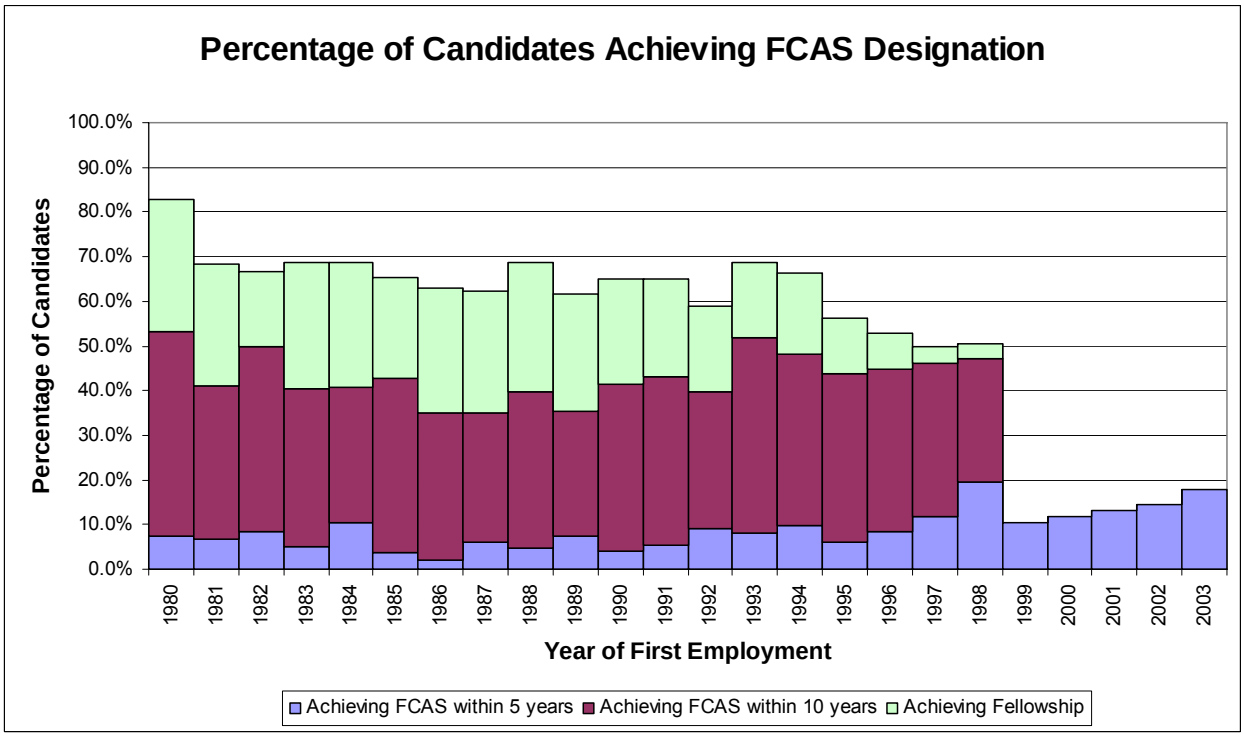


Table B.3

Completion Percentages for Associateship by Starting Cohort

Year of First Employment	Number of Candidates	Candidates reaching ACAS			% of candidates reaching ACAS		
		Within 5 Years	Within 10 Years	All	Within 5 Years	Within 10 Years	All
1980	81	25	72	81	30.9%	88.9%	100.0%
1981	73	21	59	69	28.8%	80.8%	94.5%
1982	72	27	63	70	37.5%	87.5%	97.2%
1983	77	20	59	72	26.0%	76.6%	93.5%
1984	86	26	65	81	30.2%	75.6%	94.2%
1985	84	26	68	82	31.0%	81.0%	97.6%
1986	146	42	106	132	28.8%	72.6%	90.4%
1987	194	64	144	178	33.0%	74.2%	91.8%
1988	144	49	113	131	34.0%	78.5%	91.0%
1989	200	59	140	179	29.5%	70.0%	89.5%
1990	222	80	173	193	36.0%	77.9%	86.9%
1991	186	70	147	162	37.6%	79.0%	87.1%
1992	197	73	152	169	37.1%	77.2%	85.8%
1993	185	79	148	166	42.7%	80.0%	89.7%
1994	214	89	169	189	41.6%	79.0%	88.3%
1995	164	54	111	119	32.9%	67.7%	72.6%
1996	203	54	137	153	26.6%	67.5%	75.4%
1997	189	53	120	129	28.0%	63.5%	68.3%
1998	204	65	128	135	31.9%	62.7%	66.2%
1999	173	40	95	95	23.1%	54.9%	54.9%
2000	180	44	94	94	24.4%	52.2%	52.2%
2001	251	60	103	103	23.9%	41.0%	41.0%
2002	321	90	147	147	28.0%	45.8%	45.8%
2003	392	135	164	164	34.4%	41.8%	41.8%
2004	399	120	120	120	30.1%	30.1%	30.1%
2005	379	89	89	89	23.5%	23.5%	23.5%
2006	304	49	49	49	16.1%	16.1%	16.1%
2007	170	8	8	8	4.7%	4.7%	4.7%
2008	21	-	-	-	0.0%	0.0%	0.0%

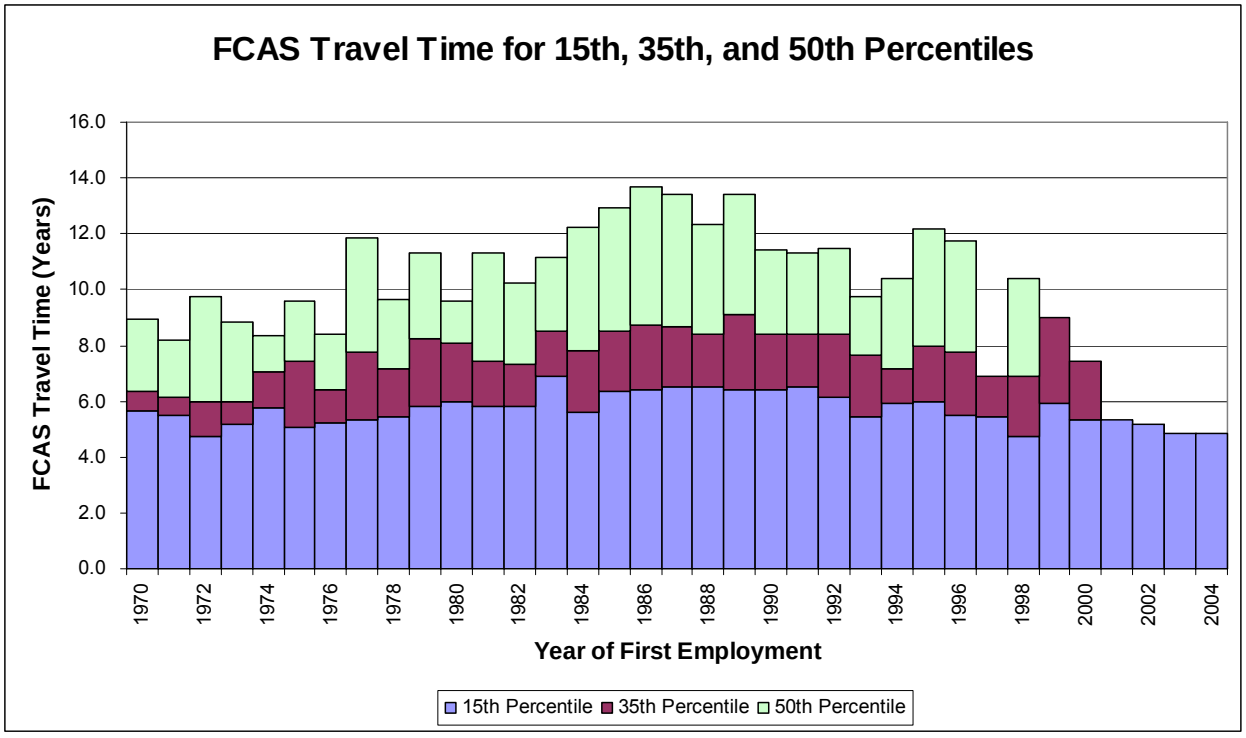
Table B.4

Completion Percentages for Fellowship by Starting Cohort							
		Candidates reaching FCAS			% of candidates reaching FCAS		
Year of First Employment	Number of Candidates	Within 5 Years	Within 10 Years	All	Within 5 Years	Within 10 Years	All
1980	81	6	43	67	7.4%	53.1%	82.7%
1981	73	5	30	50	6.8%	41.1%	68.5%
1982	72	6	36	48	8.3%	50.0%	66.7%
1983	77	4	31	53	5.2%	40.3%	68.8%
1984	86	9	35	59	10.5%	40.7%	68.6%
1985	84	3	36	55	3.6%	42.9%	65.5%
1986	146	3	51	92	2.1%	34.9%	63.0%
1987	194	12	68	121	6.2%	35.1%	62.4%
1988	144	7	57	99	4.9%	39.6%	68.8%
1989	200	15	71	123	7.5%	35.5%	61.5%
1990	222	9	92	144	4.1%	41.4%	64.9%
1991	186	10	80	121	5.4%	43.0%	65.1%
1992	197	18	78	116	9.1%	39.6%	58.9%
1993	185	15	96	127	8.1%	51.9%	68.6%
1994	214	21	103	142	9.8%	48.1%	66.4%
1995	164	10	72	92	6.1%	43.9%	56.1%
1996	203	17	91	107	8.4%	44.8%	52.7%
1997	189	22	87	94	11.6%	46.0%	49.7%
1998	204	40	96	103	19.6%	47.1%	50.5%
1999	173	18	58	58	10.4%	33.5%	33.5%
2000	180	21	65	65	11.7%	36.1%	36.1%
2001	251	33	73	73	13.1%	29.1%	29.1%
2002	321	46	96	96	14.3%	29.9%	29.9%
2003	392	70	108	108	17.9%	27.6%	27.6%
2004	399	63	63	63	15.8%	15.8%	15.8%
2005	379	41	41	41	10.8%	10.8%	10.8%
2006	304	9	9	9	3.0%	3.0%	3.0%
2007	170	1	1	1	0.6%	0.6%	0.6%
2008	21	-	-	-	0.0%	0.0%	0.0%

In order to reduce the uncertainty inherent in the emerging nature of the percentage completion statistics, Ginda Fisher suggested an alternative statistic. Ms. Fisher suggested grouping candidates by year of first employment and ranked by travel time. Various percentiles could then be directly compared across starting cohorts. In the following charts, the 15th percentile can be interpreted as the 15th fastest candidate in a starting class of 100. Once the population in a starting cohort becomes reasonably stable (i.e., no new candidates enter the population by virtue of reporting their date of first employment) these statistics will cease to develop. By comparing various travel time percentiles for starting cohorts, we can determine whether faster candidates in a particular cohort are progressing more quickly than those in other starting cohorts.

We present results in Chart B.5 for the 15th, 35th and 50th percentiles. For the 50th percentile, 50% of the starting cohort must have reached Fellowship. In this data set, the last starting cohort for which 50% of the class has reached Fellowship is the class reporting year of first employment in 1998. We note, however, that 50% of the class reporting year of first employment in 1997 has not yet reached Fellowship.

Chart B.5



Intermediate percentiles indicate results similar to those above. Analysis of these results is both encouraging and worthy of additional monitoring. For candidates having recorded date of first employment, the fastest candidates in the most recent five years appear to be moving more quickly through the exam process than those candidates with first employment dates from1985 to 1992. At the 35th and 50th percentiles, candidates in the mid-1990s are completing fellowship almost two years faster than their colleagues in the mid-1980s at least until the most recent periods for which statistics are available for these percentiles. We note the exception of 1999 where the travel time may be lengthened due to exam conversion. Again, these candidates would have been most heavily affected by the exam system changes in 2000.

In analyzing these results, it is useful to know how various points on the graph are likely to develop in the future. Recall, that in the CAS database, only 32% of candidates have coded first employment dates. As CAS staff members add additional first employment dates into the data, the size of various starting cohorts will increase. This will likely cause the travel time for any desired percentile of that population to increase. New data points are more likely to be candidates who have not yet achieved Fellowship or who have just reached Fellowship. Anecdotal evidence indicates that most candidates fill out their year of first employment on the CAS membership application, presumably because they do not want to have processing delayed because they did not complete every item.

In this respect, it is important to know how various cohorts are likely to have reported their employment dates in order to determine whether this statistic has any likely bias. As a proxy for this statistic, candidates were grouped by year of first exam[5] and coding of first employment date. The percentage of candidates with recorded date of first exam and coded dates of first employment are shown in Chart B.6.

Chart B.6

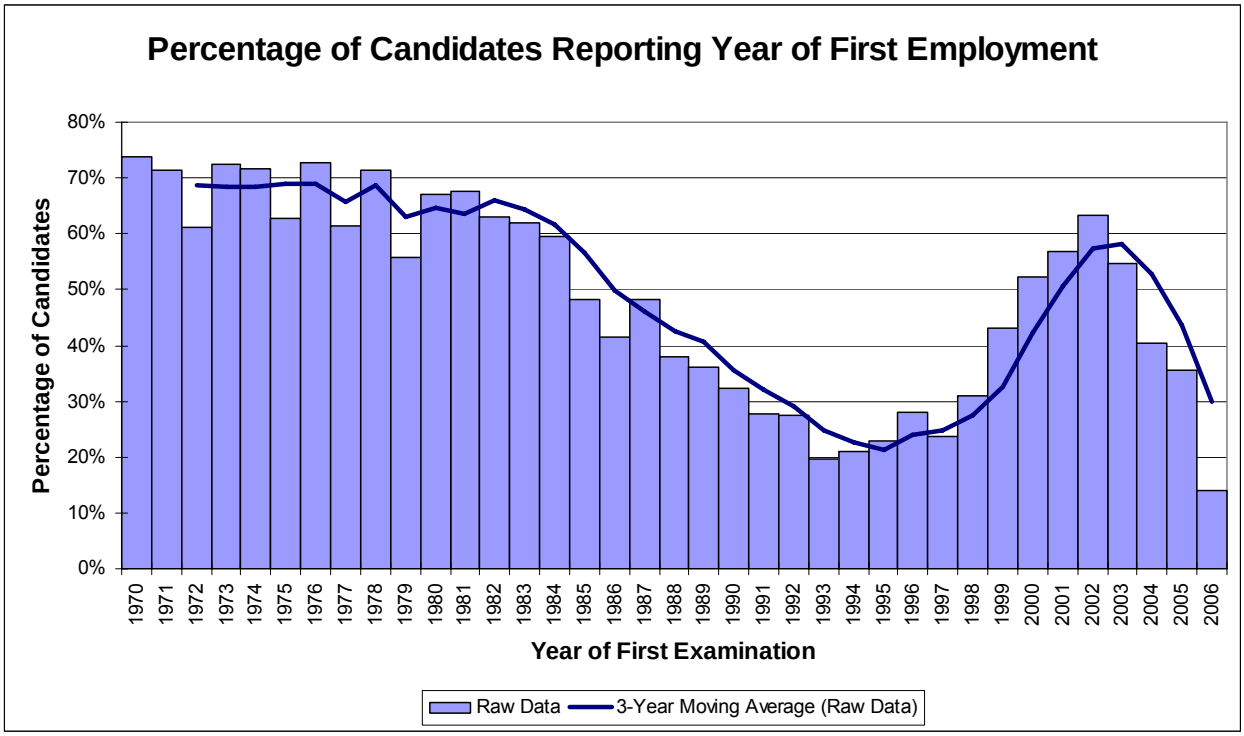


Chart B.6 indicates that many candidates who took their first exam in the 1990s have not reported their year of first employment. This could indicate that the Fisher Statistic, while promising for future monitoring, may not represent a valid picture of historical travel time across periods where capture of first employment date across the population is not consistent.

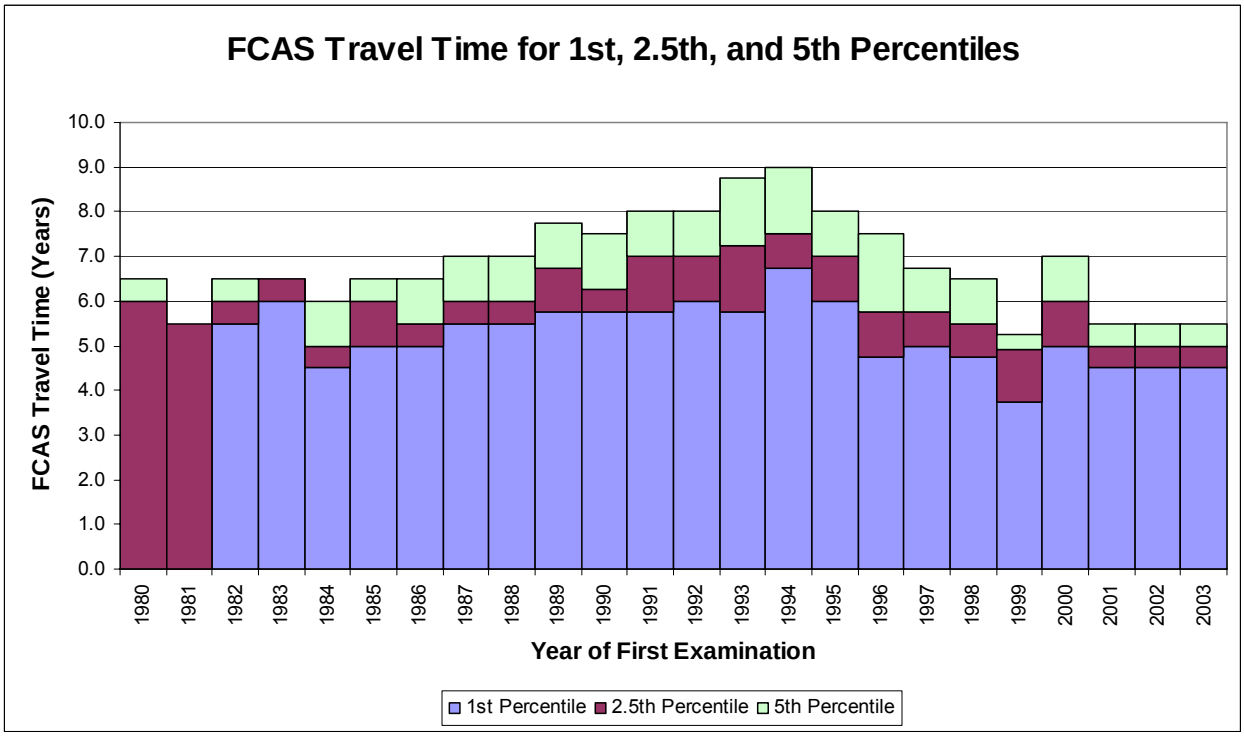
Chart B.6 also implies that a high rate of candidates drop out of the process. The CAS now captures date of first employment on exam registration forms. The fact that a very low percentage of candidates from the 1990s have coded dates of first employment may indicate that these candidates are no longer taking exams or have not reached Associateship status. These statistics are consistent with similar studies conducted by the SOA. The SOA determined that approximately 80% of candidates who sit for their first exam ultimately drop out of the exam process without achieving Associateship. Similar statistics from the SOA indicate that 70% of candidates completing their old Exam 150 (the watershed "Life Contingencies"

[5] Year of first exam is defined to be either joint exam or CAS exam, whichever is reported first in the data.

exam) fail to achieve their Fellowship designation. Initial investigations of the CAS data indicate that far fewer CAS candidates drop out once reaching Exam 4[6].

In order to remove some of the uncertainty in these statistics, the Education Policy Committee repeated the production of the Fisher Statistics using year of first exam in place of year of first employment. This compilation of the data removes the effect produced by the lack of collection of employment dates. Analysis of these statistics indicates that the apparent improvement in travel time indicated above is real and not an artifact of the employment date collection process. Because statistics based on year of first exam contain much larger populations, smaller percentiles are necessary. For example, the 1998 starting cohort, based on year of first employment, contains 204 candidates. The same cohort, based on year of first recorded exam sitting, contains 314 candidates. The results of the Fisher Statistic based on year of first exam appear in Chart B.7 and Table B.5.

Chart B.7



[6] Based on a study of candidates passing our exam 4/4B in the period 1990-1995, over 50% have completed their ACAS or FCAS designation.

Table B.5

Fisher Statistics by Year of First Examination Attempt							
Examination Attempt	Number of Candidates	Travel Time for Various Percentiles of Entering Class					
		0.5th	1.0st	2.5th	5.0th	10.0th	15.0th
1980	85	-	-	6.0	6.5	7.0	7.5
1981	85	-	-	5.5	5.5	6.5	6.5
1982	104	-	5.5	6.0	6.5	7.0	7.5
1983	108	-	6.0	6.5	6.5	7.5	9.0
1984	129	-	4.5	5.0	6.0	7.5	8.0
1985	214	5.0	5.0	6.0	6.5	7.5	8.5
1986	299	4.5	5.0	5.5	6.5	7.5	8.5
1987	455	5.0	5.5	6.0	7.0	8.8	11.0
1988	500	5.0	5.5	6.0	7.0	9.0	11.3
1989	720	5.5	5.8	6.8	7.8	9.8	11.5
1990	919	5.5	5.8	6.3	7.5	9.8	12.5
1991	895	5.0	5.8	7.0	8.0	10.5	13.5
1992	880	5.5	6.0	7.0	8.0	10.8	14.3
1993	776	5.5	5.8	7.3	8.8	12.0	-
1994	706	5.5	6.8	7.5	9.0	11.0	-
1995	656	5.0	6.0	7.0	8.0	13.1	-
1996	522	4.5	4.8	5.8	7.5	9.3	-
1997	525	5.0	5.0	5.8	6.8	8.5	-
1998	314	4.5	4.8	5.5	6.5	8.3	10.1
1999	116	-	3.8	4.9	5.3	6.0	6.5
2000	839	4.5	5.0	6.0	7.0	-	-
2001	536	4.0	4.5	5.0	5.5	6.5	7.0
2002	685	4.0	4.5	5.0	5.5	6.1	-
2003	699	4.5	4.5	5.0	5.5	-	-
2004	727	4.5	4.5	-	-	-	-
2005	1,397	3.8	3.8	-	-	-	-
2006	1,202	-	-	-	-	-	-
2007	919	0.7	-	-	-	-	-
2008	448	0.8	-	-	-	-	-

Care must be taken when interpreting these statistics since the candidate count in the older and most recent years is incomplete and this can have a significant impact on the travel times for the indicated percentiles.

TRAVEL TIMES BY CANDIDATE STARTING AGE: SCHWARTZ STATISTICS

Arthur Schwartz suggested grouping travel times by the starting age of candidates to provide useful insight into the travel time process. Accordingly, the Education Policy Committee constructed travel time statistics for members according to their age at date of first employment. Travel time is computed according to the difference between date of first employment and date of formal recognition of the designation at the CAS meeting. Compilation of this statistic required that members have valid birthdates and first employment dates coded in the CAS membership database.

The travel time for Fellows organized by age at first casualty actuarial employment is shown in Chart B.8. The travel time for candidates grouped by age at first employment is shown in Chart B.9.

It appears that candidates entering the profession in their early 30s experience shorter travel times than those entering earlier (although we also note that sample sizes are significantly smaller for older candidates). The standard deviation of travel time increases through the late 20s, peaking at age 27, and then decreases. This may be indicative of the effect of life experiences (i.e. marriage, children, job changes, etc.) on travel time. For Fellows whose age profiles may indicate that they are career changers in their 30s, it appears that they progress more quickly through exams. Possible explanations could be that more mature candidates may be more focused or disciplined in their approach to the exams, or that these candidates decide to drop out of the process earlier if preliminary indications do not show exam success.

Chart B.8

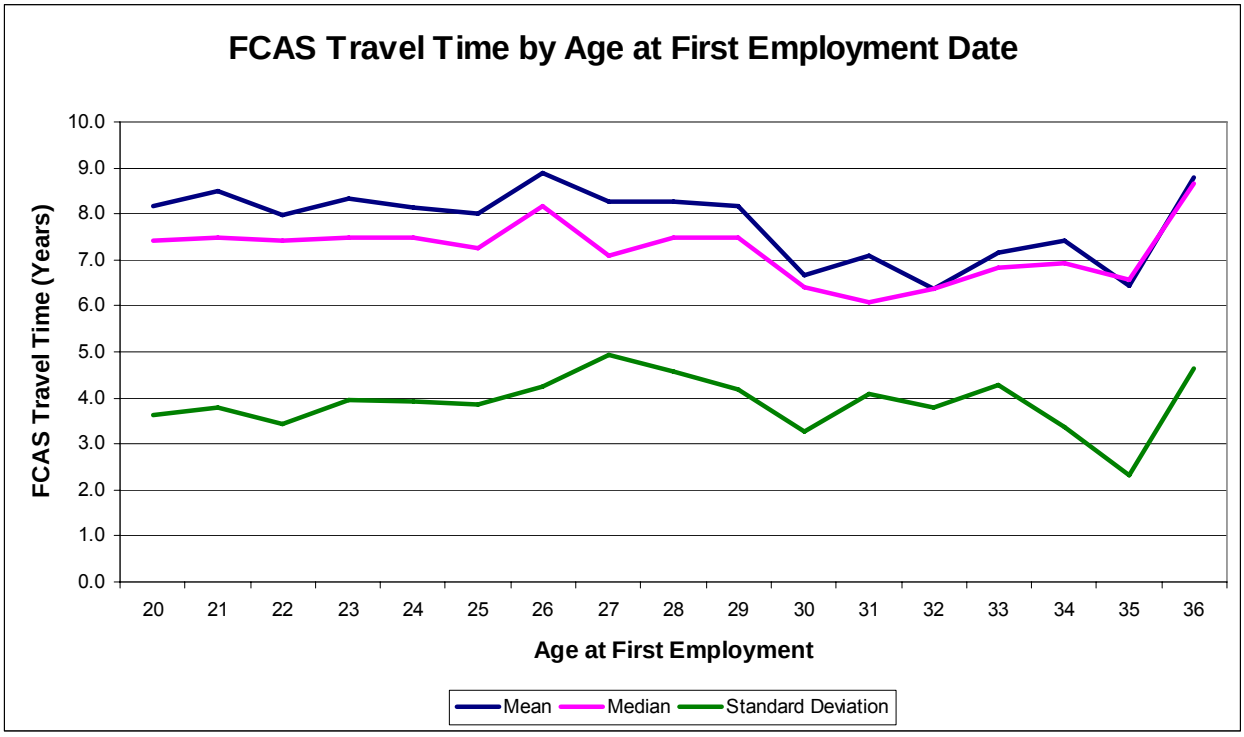
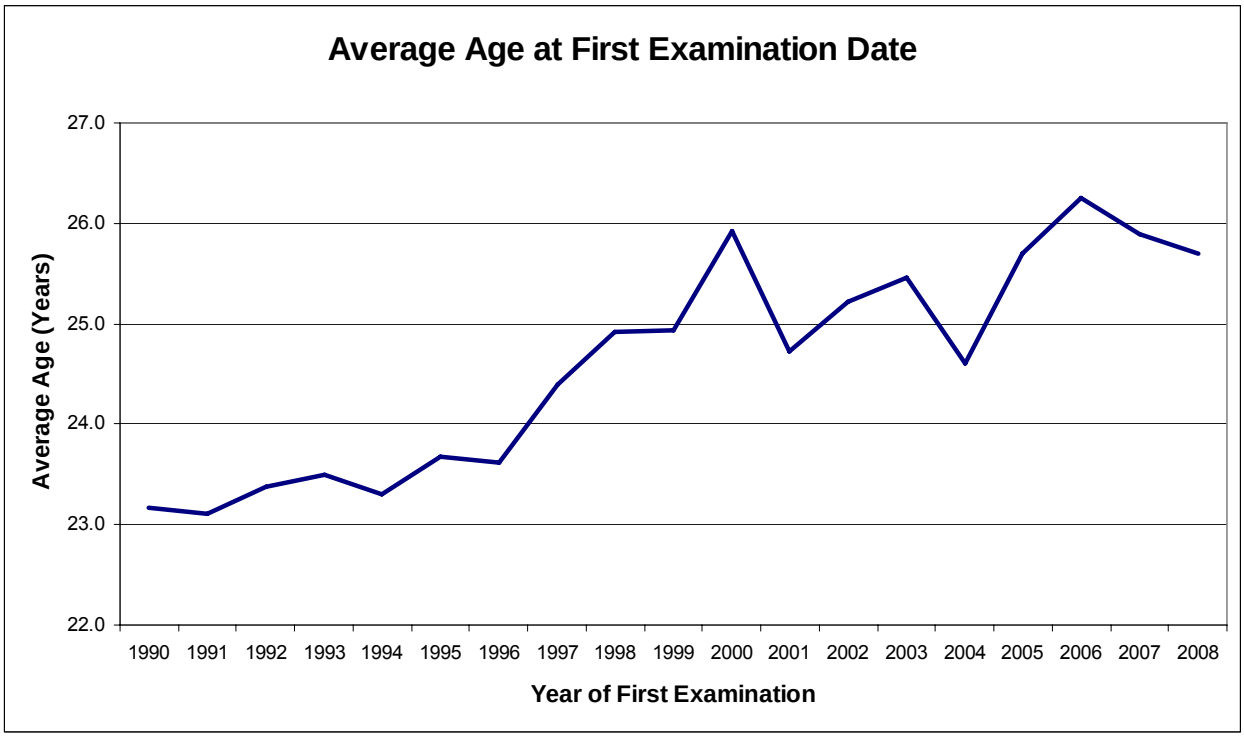


Chart B.9 clearly shows that the average age of entering candidates (reporting both birth date and date of first employment) is increasing. Given that older candidates generally report shorter travel time, this may

be an indicator that median travel times are likely to decrease as the candidate age demographic changes.

Chart B.9



APPENDIX C: DATA METHODS

All data presented in this report are derived from exam and membership databases maintained by CAS staff[7]. These databases are updated following each exam session to reflect individual exam results and membership status.

IDENTIFIED DATA ISSUES

The CAS implemented new database software in April 2008. In preparation for the conversion, CAS staff scrubbed the entire membership database over the span of a few months to identify and merge/remove duplicate records. In addition, records for candidates who only took old Exam 4B (Credibility Theory and Loss Distributions) in the pre-2000 education structure, and subsequently never took another CAS exam[8], were not converted to the new software database, but were archived instead. The significant data scrubbing has resulted in improvements to the overall quality of the data prior to the database software conversion. However as a result of the conversion, vendor extractions from the database needed to be reprogrammed. In extracting the information required for this report, the vendor excluded candidates without exam history (i.e., exams passed), which had been included in the travel time data extracts in the past. As such, there is a difference in the underlying data that has rendered some of the statistics in the 2008 report to be incomparable to statistics contained in the prior years' reports. We understand that the CAS continues to scrub the membership database for illogical records and is working with the vendor to ensure that consistency of data extract is maintained going forward.

DATA STRUCTURE

The data included in the extract this year includes exam results from both CAS exams and from exams administered jointly by the CAS and SOA. CAS staff members work with the database software vendor to export the data (as shown in Table C.1) and provide it to the Education Policy Committee (EPC) for study.

Table C.1 summarizes the data elements Included in the extract.

[7] Some statistics here include results from joint exams and are derived from the SoA database. Such statistics include candidates for the SoA and candidates that have not yet declared a preference between the Life/Health and Property/Casualty track.

[8] Most candidates who took old Exam 4B were not CAS candidates as the SOA gave credit for it under its flexible education structure prior to 2000.

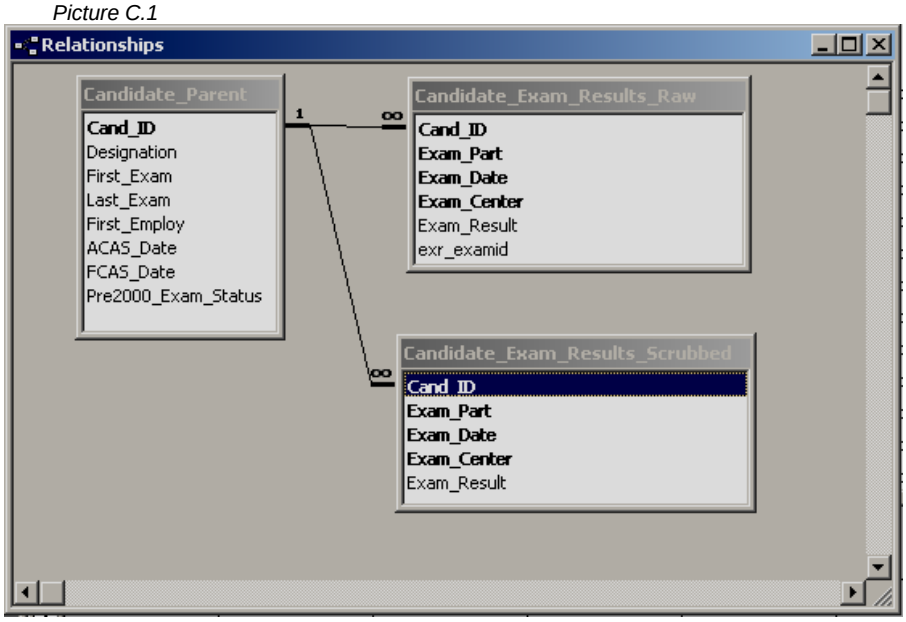
Table C.1

Field Name	Contents
MAS_ID	CAS Membership Master ID Number
MAS_DESIGN	CAS Membership Status (ACAS, FCAS, Student, Affiliate, etc.)
EXR_EXSIT	Date of Examination (YYYY/MM)
EXR_EXAMID	Examination Part
EXR_CENTID	Examination Center
EXR_GRADE	Examination Result (Pass, Fail, Not-Take, etc.)
EHI_OEXSTA	Examination Credits Prior to 2000 Transition
EHI_CEXSTA	Current Examination Credits
MAS_FTEMPL	Date of Full Time Employment
MAS_ACAS	Date ACAS Achieved
MAS_FCAS	Date FCAS Achieved

DATA PROCEDURES

The EPC scrubs, normalizes, and transforms this table into three tables using Microsoft Access. (See Picture C.1 below for relationships used for the data.)

Picture C.1



Three tables are created as part of this process: Candidate_Parent, Candidate_Exam_Results_Raw, and Candidate_Exam_Results_Scrubbed. Candidate_Parent is used to construct the travel time statistics displayed in this report. Candidate_Exam_Results_Raw is used only for ensuring correct record counts

and conversion of exam part labels, and Candidate_Exam_Results_Scrubbed is intended for future use in detailed studies of candidate progress[9].

Tables C.2, C.3, and C.4 summarize the fields contained in the three tables.

Table C.2

TABLE: CANDIDATE_PARENT	
Field Name	Contents
Cand_ID	CAS Membership Master ID Number
Cand_DOB	Candidate Date of Birth. For candidates with no reported date, this field contains zero.
Designation	CAS Membership Status (ACAS, FCAS, Student, Affiliate, etc.)
First_Exam	Date of first examination record found in "Candidate_Exam_Results_Scrubbed"; converted into decimal format for ease of use (i.e. 1998/06 → 1998.5).
Last_Exam	Date of last examination record found in "Candidate_Exam_Results_Scrubbed"; converted into decimal format for ease of use (i.e. 1998/06 → 1998.5).
First_Employ	Date of first full time P&C employment if reported by candidate; converted into decimal format for ease of use (i.e. 1998/06 → 1998.5). For candidates with no reported date, this field contains the value zero.
ACAS_Date	Date ACAS conferred. Converted into decimal format for ease of use (i.e. 1998/06 => 1998.5). For candidates not having achieved Associateship, this field contains zero.
FCAS_Date	Date FCAS conferred. Converted into decimal format for ease of use (i.e. 1998/06 => 1998.5). For candidates not having achieved Associateship, this field contains zero.
Pre2000_Exam_Status	Free form string containing a list of all pre-2000 exams for which the candidate had credit prior to the transition. For example, "1, 2, 3A, 4B".

Table C.3

TABLE: CANDIDATE_EXAM_RESULTS_RAW	
Field Name	Contents
Cand_ID	CAS Membership Master ID Number.
Exam_Part	Standardized exam identifier (see below); converted from "exr_exam_id".
Exam_Date	Recorded examination sitting (YYYY/MM) for which the candidate registered to sit for the exam.
Exam_Center	Abbreviated examination center.
Exam_Result	Pass, Fail, Not-Take, etc.
Exr_Exam_ID	Examination part label from raw data (see below).

[9] As an example, the Candidate_Exam_Results_Scrubbed table was used in a 2003 study that used Markov Chains to examine the relationship between the current and prior sitting. That study indicated a strong correlation between passing in prior and current sittings (i.e., candidates who pass are more likely to pass the next exam sitting).

Table C.4

TABLE: CANDIDATE_EXAM_RESULTS_SCRUBBED	
Field Name	Contents
Cand_ID	CAS Membership Master ID Number.
Exam_Part	Standardized exam identifier (see below); converted from "exr_exam_id".
Exam_Date	Recorded examination sitting (YYYY/MM) for which the candidate registered to sit for the exam; converted into decimal format for ease of use (i.e. 1998/06 → 1998.5).
Exam_Center	Abbreviated examination center.
Exam_Result	Converted from raw data into Pass, Fail, or Did Not Sit. Note that blank results in the raw data are not imported into this table.

In order to make the construction of queries simpler, several of the data fields are transformed. This section describes these transformations.

- **Dates**. All dates are transformed into decimal format using the rule: Decimal Date = Year + Month/12. In this fashion, it is possible to compute the difference between dates in the tables without using special query logic.

- **Exam Results**. Exam result labels are entered by hand and do not always conform to established data entry standards. Table C.5 contains the transformations from raw data to standardized labels.

Table C.5

EXAM RESULT TRANSFORMATIONS	
Raw Data	Converted Value
FAIL	FAIL
NOT-TAKE	DID NOT SIT
PASS	PASS
REFUND	DID NOT SIT
TRANSFER	DID NOT SIT
HOLD	DID NOT SIT
INVA	DID NOT SIT
INVALID	DID NOT SIT

- **Exam Part Labels**. Exam part labels as coded in the raw data are difficult to use because their ASCII sort order is not the natural order in which we are accustomed to seeing them and because Microsoft Access SQL does not distinguish between upper and lower case letters. Table C.6 contains the raw data labels and their converted values. The Exam_Value represents the percentage of an exam attributed to each part label.

Table C.6

EXAM PART LABEL TRANSFORMATIONS		
EXR_EXAMID	Converted_Exam	Exam_Value
1	01X	1.00
2	02X	1.00
3A	03A	0.33
3b	03b	0.33
3B	03B	0.33
3C	03C	0.34
3	03X	1.00
4A	04A	0.50
4B	04B	0.50
4	04X	1.00
5A	05A	0.50
5B	05B	0.50
5	05X	1.00
6	06X	1.00
7C	07C	1.00
7U	07U	1.00
7	07X	1.00
8C	08C	1.00
8	08X	1.00
9	09X	1.00
PC	0PC	0.00
VE	0VE	0.34
VF	0VF	0.33
VS	0VS	0.33
10	10X	1.00

In addition to the transformations above, the following adjustments are made to the data:

- Members who achieved Fellowship via mutual recognition are identified within the Candidate_Parent table to be excluded from the Travel Time report. Based on the candidate IDs included in the 2008 database and a listing provided by the CAS, 18 records are excluded for this reason.

- Illogical data entries in the Candidate_Parent table were manually adjusted for after consultation with and confirmation from the CAS (e.g., First_Exam is a date later than ACAS_Date or FCAS_Date; Designation field was blank but with a valid ACAS_Date and/or FCAS_Date; Designation field was not blank, but valid ACAS_Date and/or FCAS_Date missing; FCAS_Date is before First_Exam and Designation field is blank; etc.).

- The CAS's recording standard is to leave the ACAS_Date as a null value if a candidate achieves Fellowship without ever achieving Associateship (i.e. their last exam to completion is a preliminary or Associateship-level exam). To avoid inconsistencies in membership counts when compiling ACAS information, the ACAS_Date field was set equal to the FCAS_Date field.