

# RECORD OF SOCIETY OF ACTUARIES 1989 VOL. 15 NO. 3A

## MARKET FOR ACTUARIES

Moderator: ROBERT M. MUSEN  
Panelists: DARYLE G. JOHNSON  
KIN ON TAM  
HAL S. TEPFER  
Recorder: MARCY F. LEHRER

- o *The forum will present the results of a recently completed comprehensive survey of employers of actuaries. Topics will include demand for actuaries by both traditional employers and nontraditional employers (e.g., investment banks and software firms) and the changing pattern of demand since the last survey was conducted six years ago. Implications for future hiring, recruiting, and training will be discussed.*

MR. ROBERT M. MUSEN: Joining me on the panel are Daryle Johnson, Hal Tepfer and Kin Tam. In addition, Linda Delgadillo and Jim Weiss of the Society worked very diligently behind the scenes to make this presentation possible. Scott McGaire of the Committee on Career Encouragement, of which we all here are members, was unable to attend this session. Otherwise, he would have been up here with us. Scott was involved in sorting and analyzing a good portion of the data, and I would like to acknowledge him.

Before proceeding, I want to issue the standard disclaimer: it goes without saying that the summarized results of the survey represent the collective opinion of the respondents and not that of our subcommittee or the SOA.

This Open Forum is entitled "Market for Actuaries." The title might be a slight misnomer since we plan to spend the majority of the time reviewing, summarizing and discussing a survey on the need for actuaries recently distributed to and returned by employers of actuaries. I believe that this is the third such survey that has been conducted; the previous two were done in 1973 by Russell Smith and in 1983 by Bill Poortvliet and the then members of this Committee. This year's survey was returned by firms constituting roughly 25% of the Society's membership.

I am going to discuss the survey design and some general trends that are in evidence. First, however, I would like to indicate a few of the changes that we instituted this year in comparison to the last two surveys. In response to issues raised by the Task Force on The Actuary of the Future, we distributed the survey to nontraditional employers of actuaries; these include software houses, management consultants and investment banks. Unfortunately, the response rate from these firms was quite low: a total of 46 companies (7 investment firms and 39 others) in this category responded to our survey. Further, we attempted to ask questions that would address the actuary of the future. For example, we had a section on the change in the number and the change in the role of actuaries that employers might anticipate as a result of changes in external forces such as legislation, AIDS, mergers and acquisitions and insurance company decentralization. Hal Tepfer and Kin Tam will discuss the responses to these questions later.

An overview of our survey is shown on the next page. As you can see, it was distributed to insurance companies, consulting and brokerage firms, universities and governmental agencies as well as the nontraditional employers mentioned above. The surveys overlap, but there are significant differences. For example, universities were not asked as much about demand for actuaries as about the ways that the Society can increase interest in the profession. We will not discuss the results from the smaller categories (universities, software firms, investments firms and management consultants) because the total number of responses does not merit such.

Before moving on, however, I want to touch on another survey that recently was conducted by Ardian Gill and was presented at the Centennial Meeting in Washington, D.C. This survey was sent to CEOs of organizations employing five or more actuaries, insurance commissioners and a

## OPEN FORUM

### SCOPE OF 1989 SURVEY OF ACTUARIAL DEMAND

- o Conducted in Summer of 1989
- o Responding Firms
  - 169 Insurance Companies
  - 74 Consulting and Brokerage Firms
  - 14 Governmental Agencies
  - 23 Colleges and Universities
  - 7 Investment Firms
  - 39 Software Firms, Management Consultants, and Other Employers
- o Responding Companies Represent Total Staff of
  - 1,785 FSAs
  - 1,108 ASAs
  - 1,439 Students

sample of actuaries themselves. The latter group included Fellows of the Casualty Actuarial Society (FCASs) and FSAs. The focus of the survey was on how actuaries as a group view themselves and how they are viewed by their employers. There is some overlap between this survey and the one we are discussing, but our focus has been on demand for actuaries and what will influence that demand.

Before I turn to Hal, Kin, and Daryle, I would like to give you an overall feel for the results of the survey. I believe that Exhibit 1 does just that. The first line shows the actual Society membership. The second line shows the membership as projected by Linden Cole in 1980. I think it is quite remarkable that projected demand is so close to the actual. The next two lines show the projected demand as indicated by the 1983 and 1989 surveys. It is interesting to note that each survey has indicated a level of demand higher than the survey preceding it. In addition, the rate of growth over the first five years of any of the surveys is in the 7% range while the rate of growth of Society membership continues to be in the 5% range. Clearly, we should all have jobs for some time to come.

MR. KIN ON TAM: In this part of the survey, we asked the Chief Actuary of each company to indicate, by type of work, the number of Fellows, Associates, and Actuarial Students employed as of June 1989, as well as the projected number required as of January 1994 (roughly in 5 years' time).

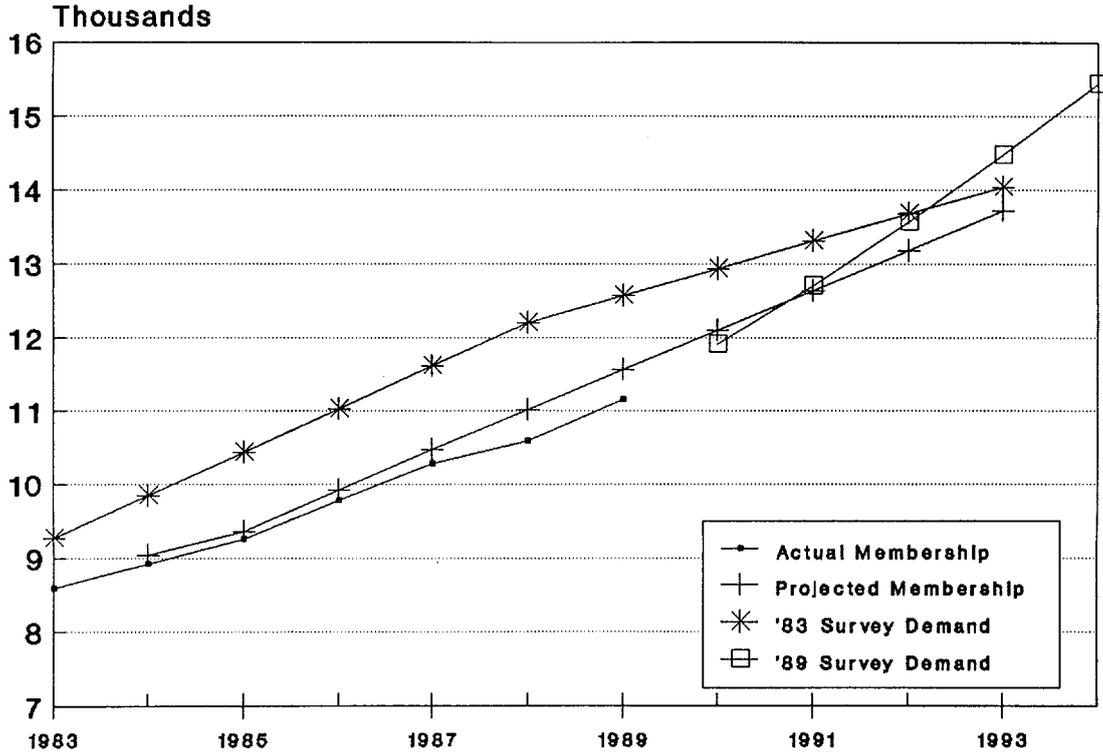
We are going to discuss the results for Fellows, Associates, and Students in turn, and we are going to alternate between insurance companies and consulting firms. First, the results for Fellows employed by insurance companies are shown in Exhibit 2. The first four categories above constitute the line functions, while the others can be described as corporate functions.

On the right-hand side of Exhibit 2, proportionally magnified, is the distribution of the projected demand as of 1994.

1. Overall, the demand for Fellows in insurance companies is expected to grow at an annual rate of 5% a year.
2. There is an expected growth in every type of work. But it is one of the smaller categories, investment, that stands out as the specialty with the highest annual growth rate, namely, 13% a year.
3. There is no significant redistribution of Fellows expected among different types of work.

MR. HAL S. TEPFER: Exhibit 3 is somewhat similar, but it is for Fellows in consulting firms and insurance brokers; the breakdown is both now and what is expected to be in 1994. I would like to note that several of the largest consulting firms did not respond to this survey. Due to decentralization, it is difficult for them to compile the information that we were looking for. The bottom box shows the percentage for pension benefits and deferred compensation programs; the next box is for consulting services provided to insurance companies; the next is for life and accident and health benefits; and then we have lumped everything else together in a category called "other."

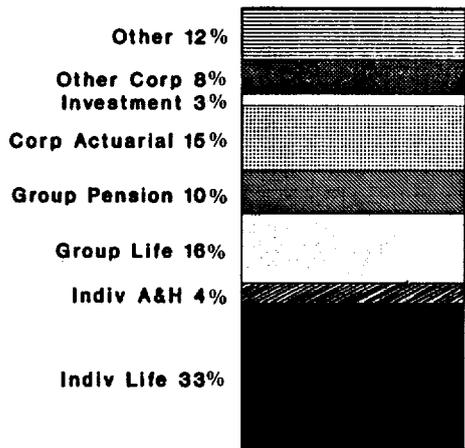
# Supply and Demand for Actuaries



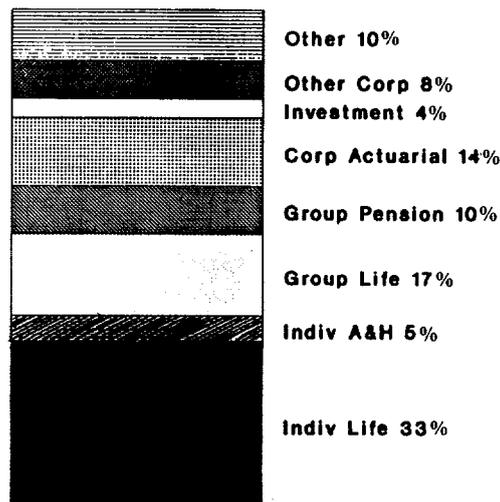
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MARKET FOR ACTUARIES  
EXHIBIT 1

# Insurance Companies Fellows

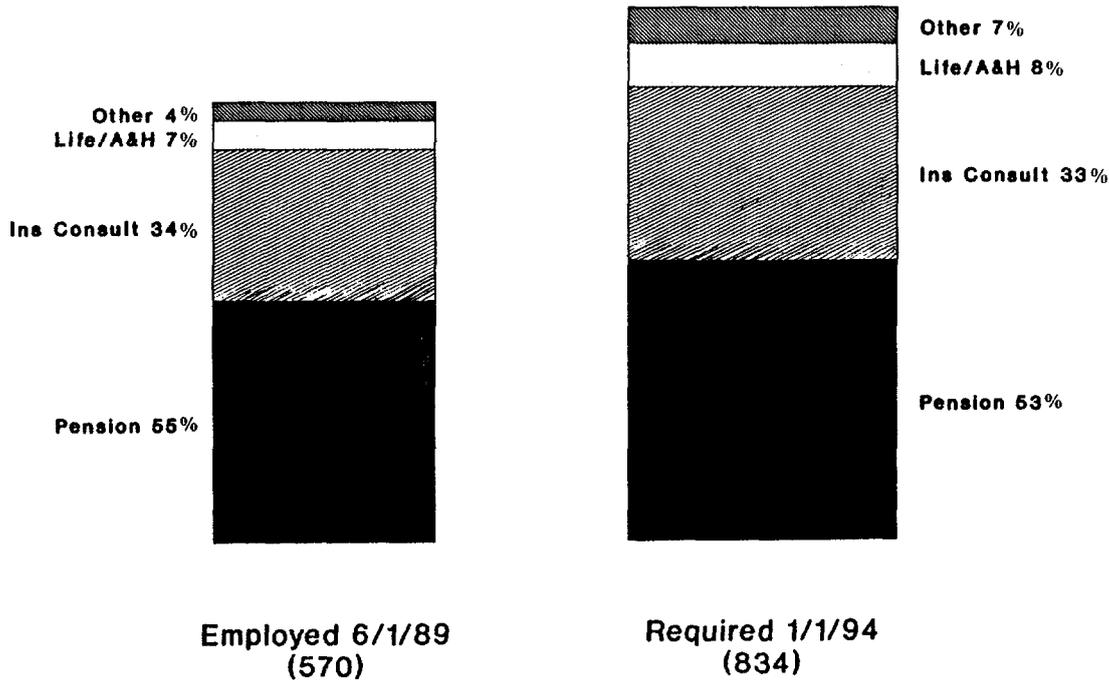


Employed 6/1/89  
(1,163)



Required 1/1/94  
(1,469)

# Consulting Firms & Insurance Brokers Fellows



1275

MARKET FOR ACTUARIES  
EXHIBIT 3

## OPEN FORUM

If you project from 1989 forward to 1994, you can see that there is an average annual increase of 8%. The breakdown among the four categories that we show here does not shift very much. Percentagewise, there is a small decline in pension benefits, a small decline in insurance consulting, a small increase in life and accident and health and an increase in the "other" category. It is expected that there are going to be significant annual increases in the investment, risk management and other employee benefits areas in the next four to five years.

MR. TAM: Exhibit 4 is for Associates employed in insurance companies.

1. The demand for Associates in insurance companies is expected to grow at an annual rate of 7%, which is higher than the 5% for Fellows.
2. As in the case of Fellows, investment is the area with the highest projected increase in demand.
3. The overall distribution of employment is about the same as for Fellows.
4. However, compared with Fellows, Associates are a little better represented in the product lines (the bottom 4 categories on the graph) than in the corporate functions. This seems to make sense from the standpoint of the required training to step into the corporate functions.

MR. TEPFER: Again, Exhibit 5 shows the current situation and what is expected in 1994. Here, there is a greater difference between the current and the future situation when you look at the pension side, a decrease from 67% to 61%. Because we surveyed consulting firms and insurance brokers together, these results could be a little deceptive. In general, I do not think that there is a real significant change. Based on the results of this survey, we see that the annual growth for the Associates in consulting firms is expected to be 12% versus the 8% for the Fellows.

MR. TAM: Exhibit 6 is for Students employed in insurance companies. By Students, we mean Actuarial Students who have not attained Associateship.

1. The annual growth rate in the demand for Students in insurance companies is about 6%.
2. In the case of Students, there is an even higher concentration in the line functions as compared with the corporate functions. In fact, as we go from Fellows to Associates to Students, the representation in the line functions goes from 63% to 75% to 81%.

MR. TEPFER: Exhibit 7 shows the Students for consulting firms and insurance brokers. Again, the results here show that the increase will not change the distribution significantly. The results show a 9% annual increase in the growth of Students in these types of firms in the next five years. We do not have exhibits for people working in the government. We did survey government employers, and the annual increase in growth there is expected to be about 4% per year. For comparison, for insurance companies, the overall growth of Associates and Students is expected to be about 6.5%.

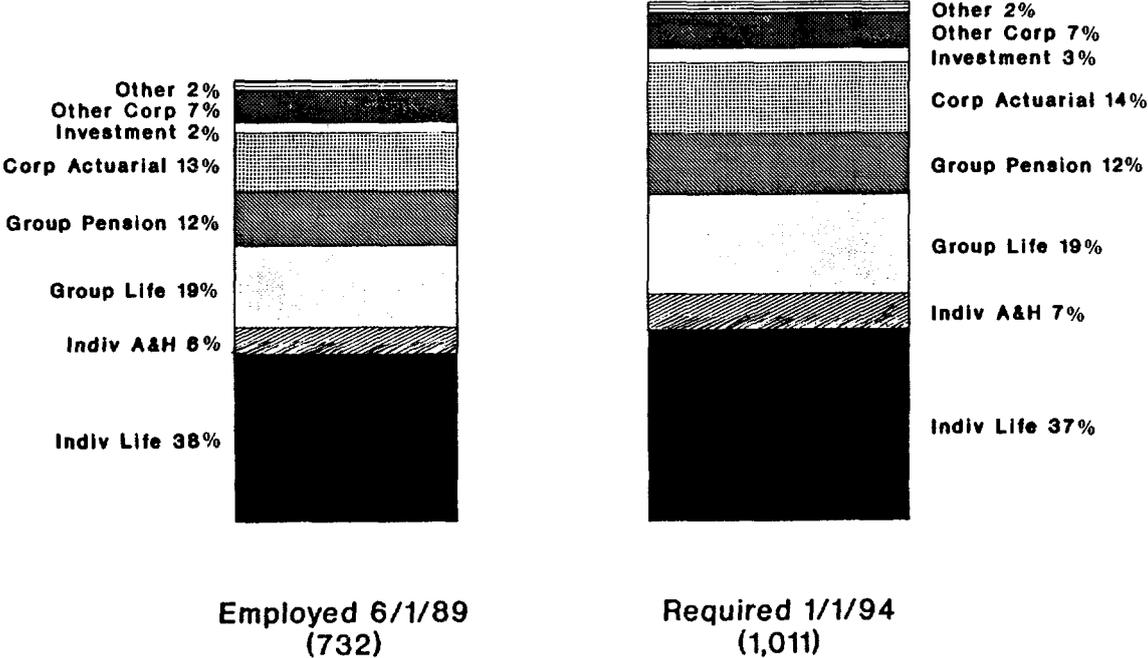
MR. TAM: The worldwide distribution of the membership of the Society of Actuaries is as follows:

U.S.A.	75%
Canada	18%
Foreign	7%

This is based on the Society's database, not on an extrapolation from our survey. This by itself is interesting, because it suggests that in Canada, there is a significantly higher density of actuaries per capita.

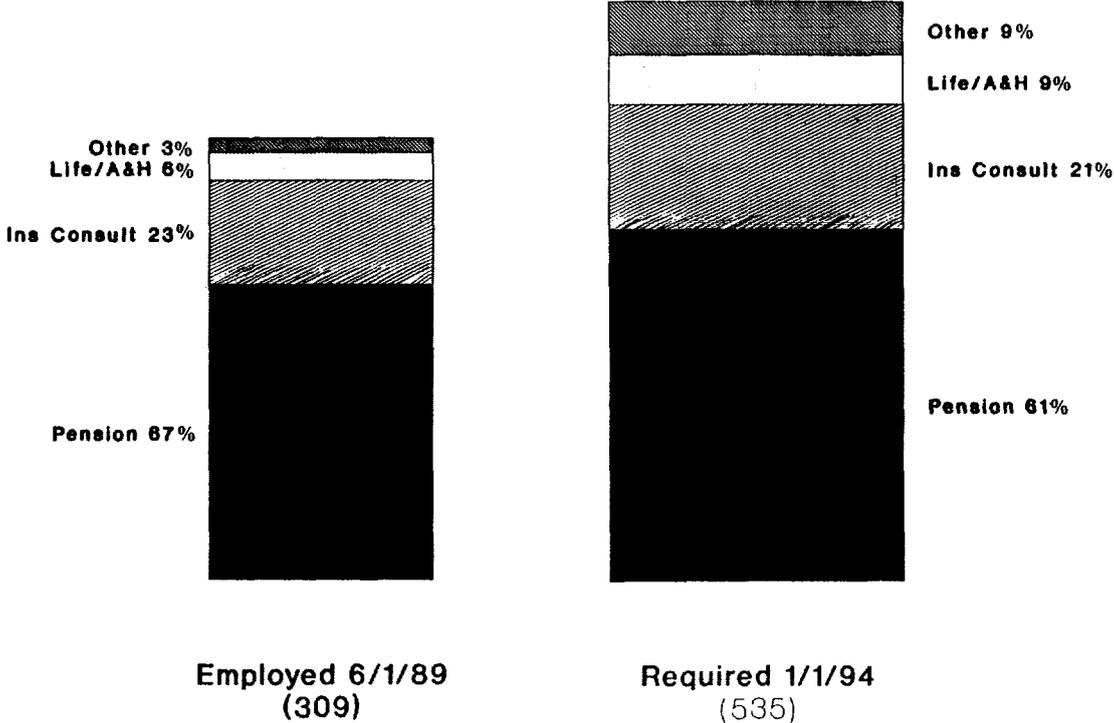
It is therefore not surprising that among the *insurance companies* responding to the survey, the projected increase in actuarial demand is greater in the U.S. than in Canada: for Fellows, an annual growth rate of 6% in the U.S. versus 3% in Canada; and for Associates, an annual growth rate of 8% in the U.S. versus 4% in Canada.

# Insurance Companies Associates



MARKET FOR ACTUARIES  
EXHIBIT 4

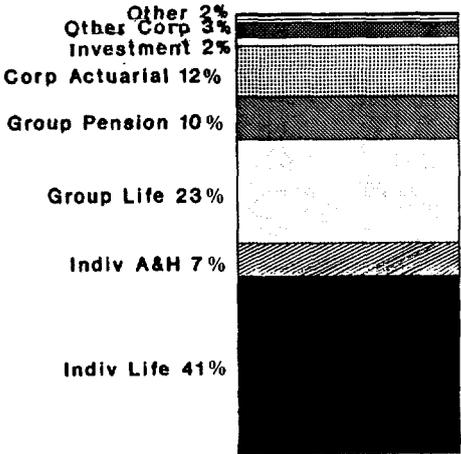
# Consulting Firms & Insurance Brokers Associates



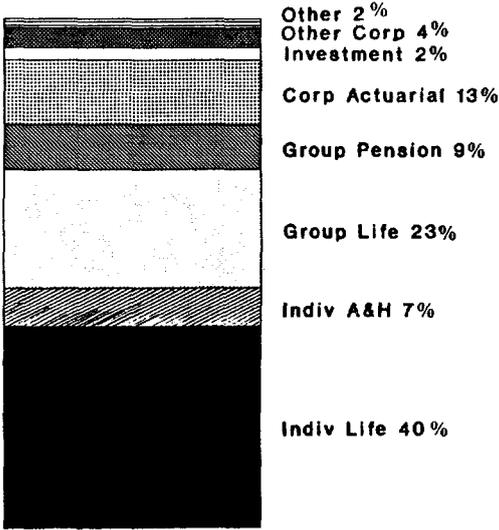
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OPEN FORUM  
EXHIBIT 5

# Insurance Companies Students



Employed 6/1/89  
(810)

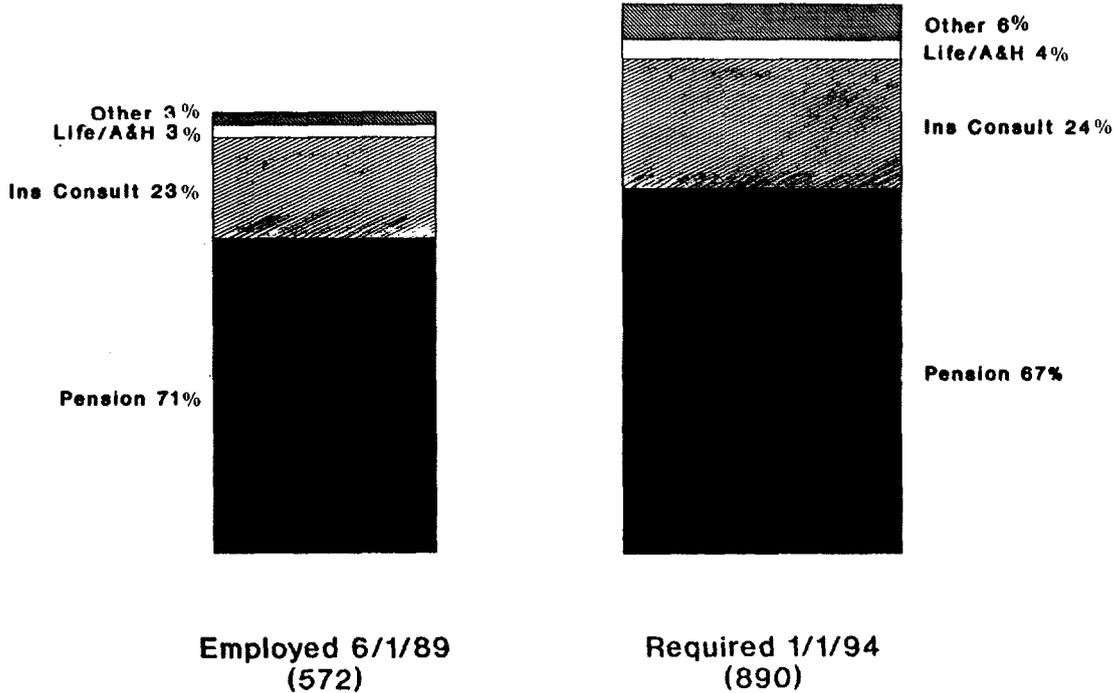


Required 1/1/94  
(1,088)

1279

MARKET FOR ACTUARIES  
EXHIBIT 6

# Consulting Firms & Insurance Brokers Students



1280

OPEN FORUM  
EXHIBIT 7

## MARKET FOR ACTUARIES

Among 6 major geographical regions in the U.S., the projected increase in demand for Fellows and Associates in insurance companies seems to be highest in the Southeast and Southwest, i.e., the Sun Belt.

	<u>Annual FSA Growth</u>	<u>Annual ASA Growth</u>
Northeast	5.2%	7.4%
Central	5.7%	7.0%
Far West	6.1%	9.1%
Southwest	7.9%	13.3%
Southeast	7.0%	12.6%
Mid-Atlantic	4.4%	4.8%

MR. TEPFER: Now we will take a look at the sources of actuarial staff (Exhibit 8). We asked the employers who responded to our survey where they were getting their actuarial staff, and we asked them to break down for us, for the last 12 months hires, what those sources were. This chart shows the breakdown among some of the options that we gave them as well as a category of "other." You can see the actuarial and non-actuarial programs together account for about 46% of the total hires over the last 12 months. We did not distinguish between new hires directly out of college and hires in general, which is why we see 23% from agency referrals, 16% unsolicited, 4% internal transfers. The "others" category includes such things as companies that have taken over other firms and, therefore, have taken the Associates, Fellows and Students and brought them into the acquiring firm.

We asked companies to rate, on a scale from -5 to +5, how these sources have changed in the recent past.

On Exhibit 9 we have plotted the histogram (frequency distribution) of their responses for each of the 6 major sources of new actuarial staff. These histograms are layered one after another in the diagram.

The centering of each of the distributions around zero seems to suggest that the recent trend has been fairly neutral for each of the more conventional sources. However, in the category labeled "Other," a few companies have found an unconventional source to have been particularly helpful, perhaps in a serendipitous way. This is demonstrated by the significant tail on the distribution labeled "Other."

These distributions on future trends (Exhibit 10) are also highly centered but a little more skewed towards the right. They seem to suggest a slightly greater emphasis on one or more of these sources, in particular, Actuarial and Nonactuarial Programs, but not necessarily at the expense of the other sources.

The category of "other" sources no longer seems to have as pronounced a tail on the far right as it did in the graph on recent trends, leading one to infer that the serendipitous sources are not expected to repeat themselves in the future.

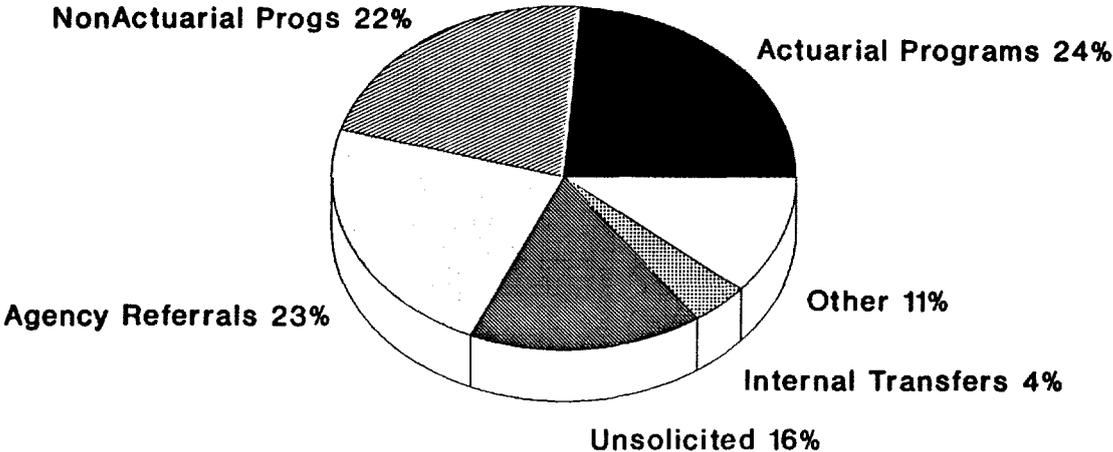
MR. TAM: We listed 10 educational backgrounds and asked companies to observe changes in these backgrounds among their actuarial hires (Exhibit 11). In each case, we asked whether that particular background has been (a) on the rise, (b) about the same, or (c) on the decline.

1. Computer facility (third column from the left) has overwhelmingly been observed to have been on the rise, followed by actuarial studies (second column from the left) and business courses (fourth from the left).
2. A liberal arts background and a diversified background (sixth and seventh columns from the left) seem to have been on the decline somewhat.
3. The other backgrounds, such as mathematics, knowledge of finance, graduate degrees and communication skills, seem to have remained about the same in the last 5 years.

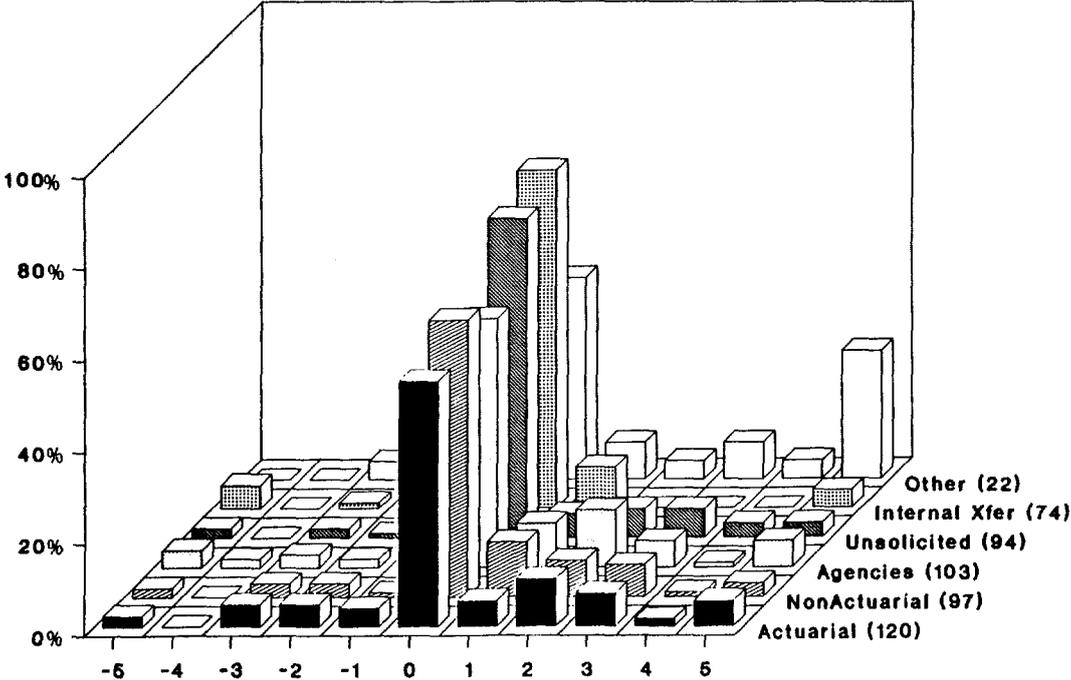
The subheading on Exhibit 12 should have read "Desired Trend" rather than "Expected Trend." We are interested in what employers would like to see, not what they expect to see.

# Sources of Actuarial Staff

## Last 12 Months Hires



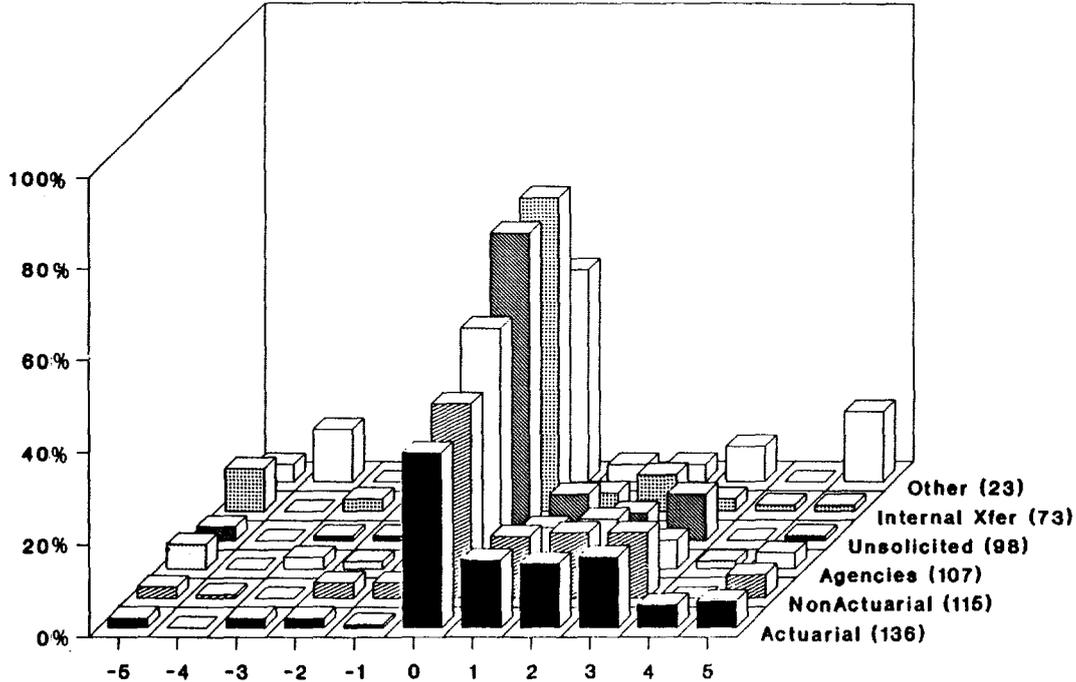
# Sources of Actuarial Staff Recent Trends



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MARKET FOR ACTUARIES  
EXHIBIT 9

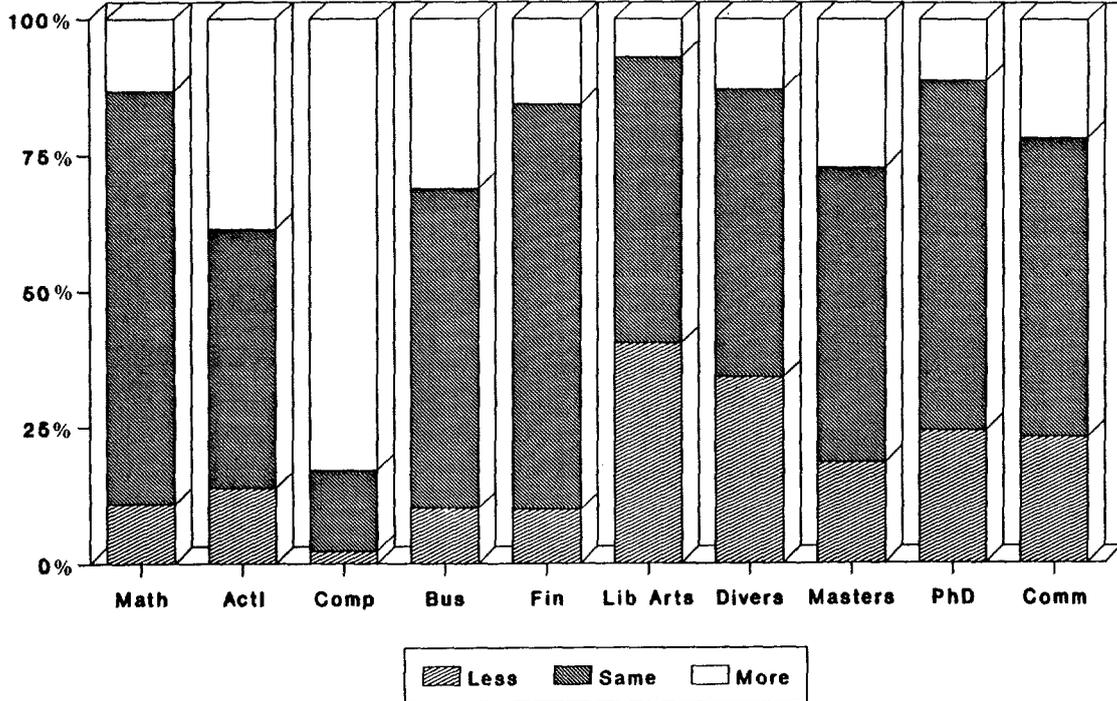
# Sources of Actuarial Staff Future Trends



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OPEN FORUM  
EXHIBIT 10

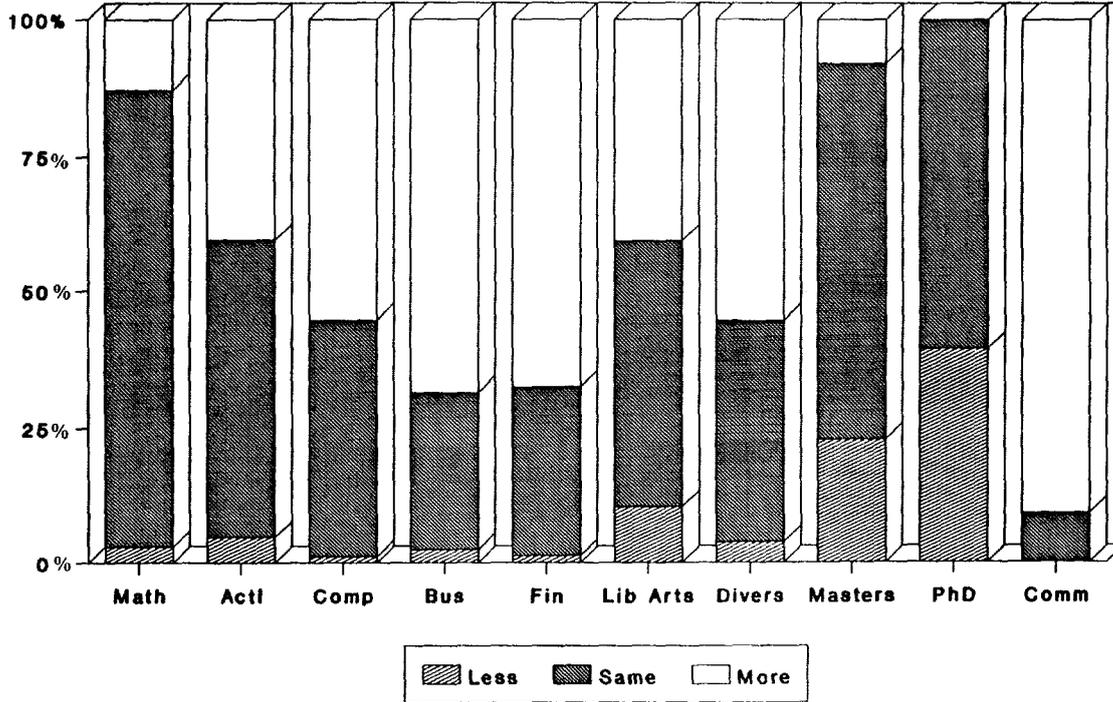
# Changes in Educational Background Trend in Last 5 Years



MARKET FOR ACTUARIES  
EXHIBIT 11

# Changes in Educational Background

## Desired Trend in Next 5 Years



1286

OPEN FORUM  
EXHIBIT 12

## MARKET FOR ACTUARIES

1. The most eagerly desired improvement seems to be in communication skills. In fact, not a single respondent seems to think they could do with less communication skills.
2. The other desirable improvements are in business and finance, computer and actuarial courses, liberal arts and diversified background.
3. There seems to be a neutral stand on the need for further improvement in the mathematics background among hires.
4. Master's degrees seem not to be particularly desired, and Ph.D.s seem even less so.

MR. TEPFER: Next, we asked respondents to rate the importance of 10 criteria in selecting new actuarial staff members, as well as the extent to which these standards have been met (Exhibit 13). On the left of the graph we show the importance rating. On the right we show how the expectations have been met.

1. On a scale of 1 to 10, integrity came first in importance with an average score of 8. It is also considered to be the criterion on which expectations are most often met.
2. Work experience and management traits seem to receive the least emphasis at the entry level. We attribute this to the belief that these qualities can be developed over time, as we shall see in Exhibit 14.
3. At the senior hiring level, integrity is still rated the most important, in fact, slightly more so than at the entry level.
4. Understandably, exam potential and scholastic achievement are not as important at the senior hiring level. On the other hand, management traits and work experience take on greater significance.
5. More than 50% of insurance companies and consulting firms alike reported that hiring standards have been met (Exhibit 15). About one third of employers find it necessary to accept slight compromises. For insurance companies, only 10% of the time were lower standards accepted; for consulting firms the response was 15%.

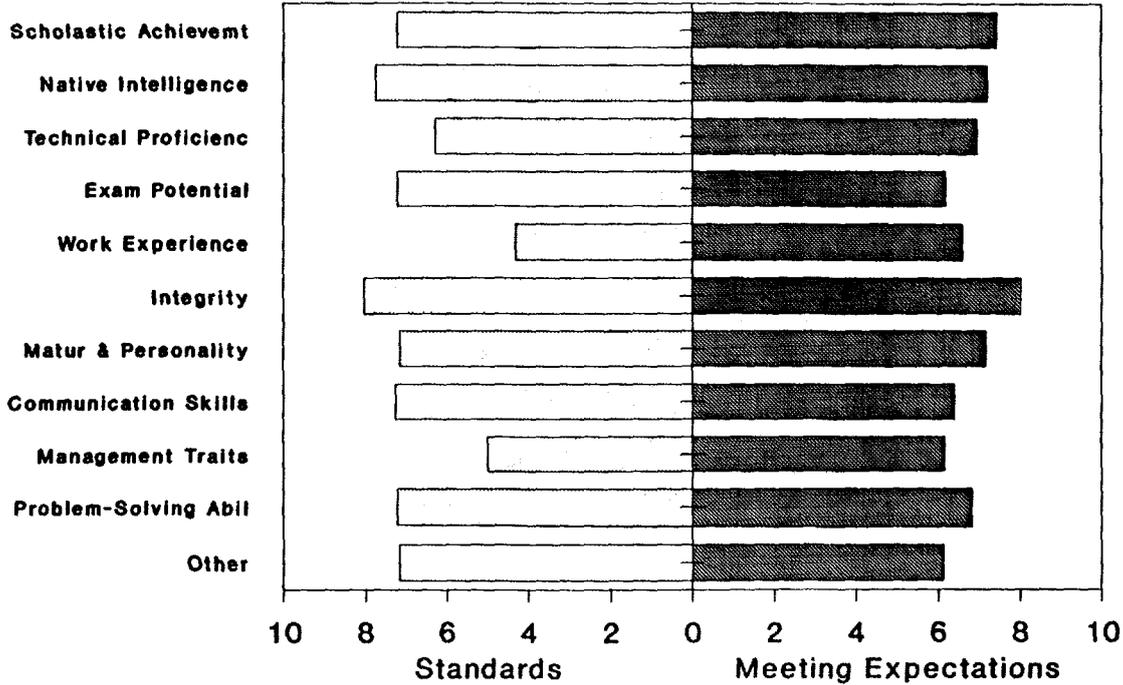
MR. TAM: Next we asked whether the number of suitable recruits was adequate (Exhibit 16).

1. For both insurance companies and consulting firms alike, the responses are evenly divided as far as the adequacy of recruits is concerned.
2. Governmental employers, however, seem to encounter more of a shortage of suitable recruits. The reasons cited include pay restriction, civil-service red tape, unawareness of government work, as well as aversion to government work.
3. The predominant opinion has it that the quantity of recruits has improved in the last 5 years (Exhibit 17).
4. Only a few of the respondents have seen a decline in the quality of recruits.
5. We asked whether the change in the exam system encourages students to pursue an actuarial career, to which the answers were about 70% positive (Exhibit 18).
6. We asked whether the change would better prepare students for their work, to which the answers were about 70% affirmative.
7. We asked whether the change will lengthen the time to productivity on the part of the students, to which the answers were about 80% positive.
8. Among the respondents who elected "other" as an answer, one third felt that the change would have a minimal effect or that more time would be needed to observe the effects.

# Standards for Selecting New Staff

## Entry Level

Scale: 0 to 10



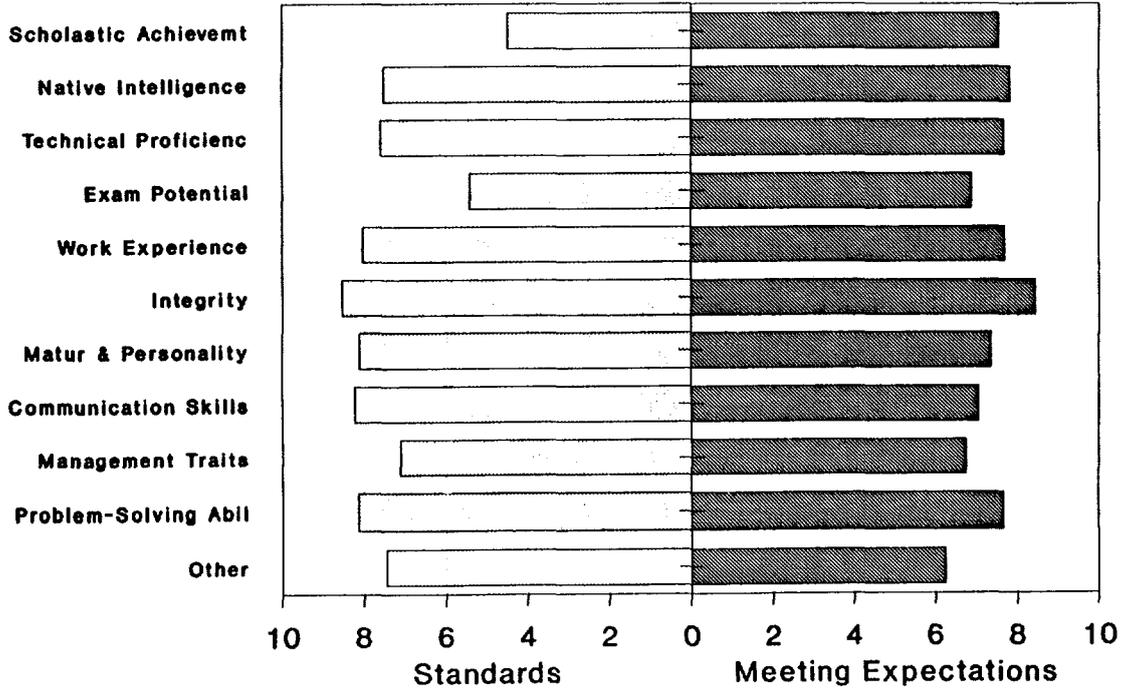
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OPEN FORUM  
EXHIBIT 13

# Standards for Selecting New Staff

## Senior Level

Scale: 0 to 10

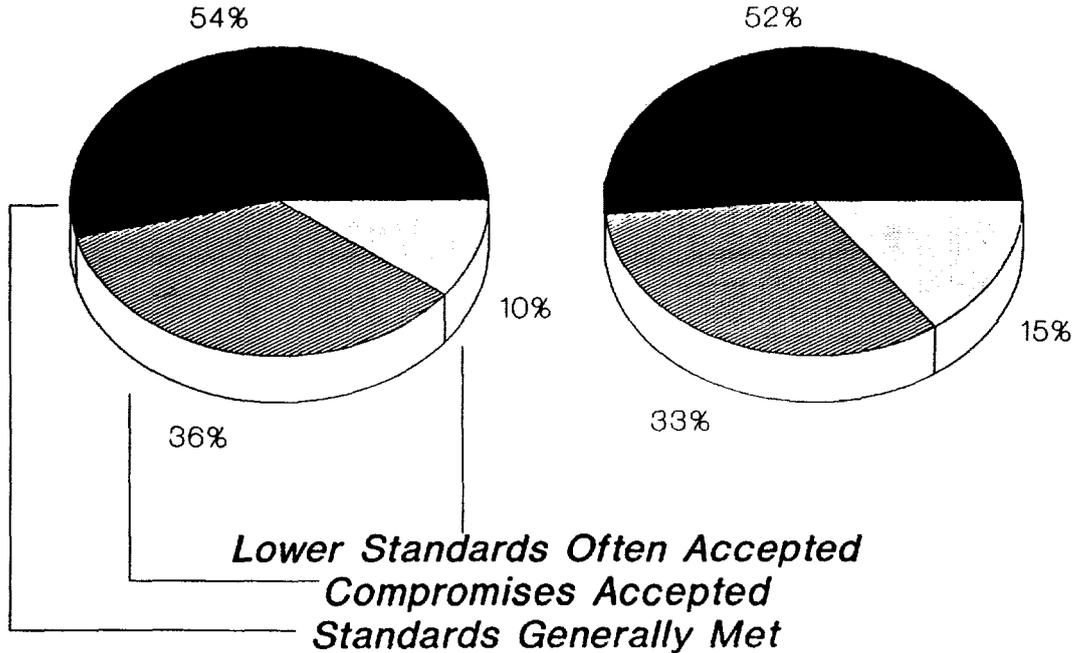


# Standards for Selecting New Staff

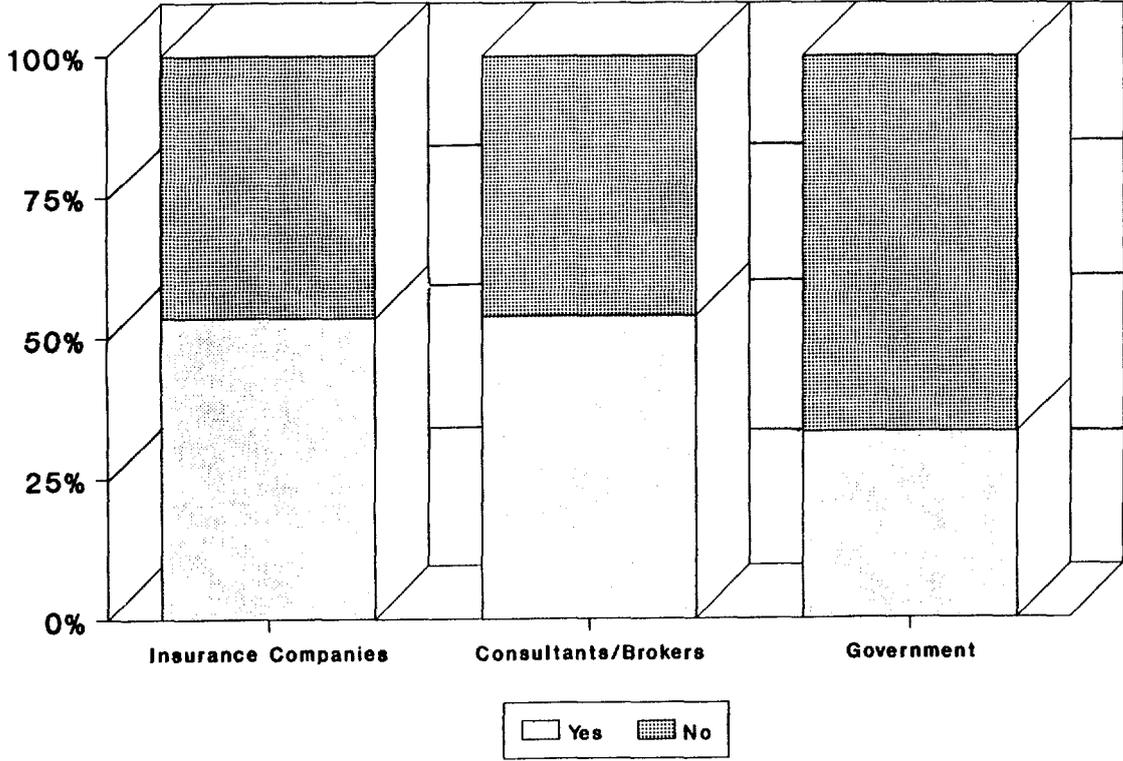
## Success in Meeting Standards

Insurance Companies

Consulting Firms/Insurance Brokers



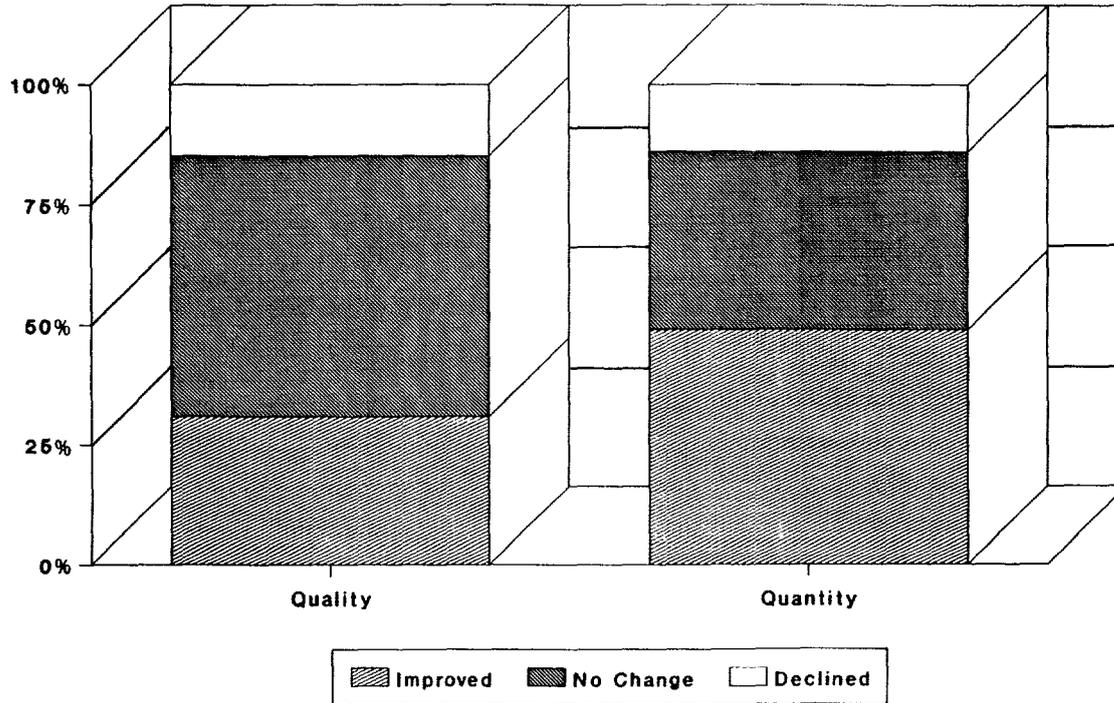
# Adequate Number of Recruits?



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MARKET FOR ACTUARIES  
EXHIBIT 16

# Changes in Quality/Quantity of Recruits Last Five Years

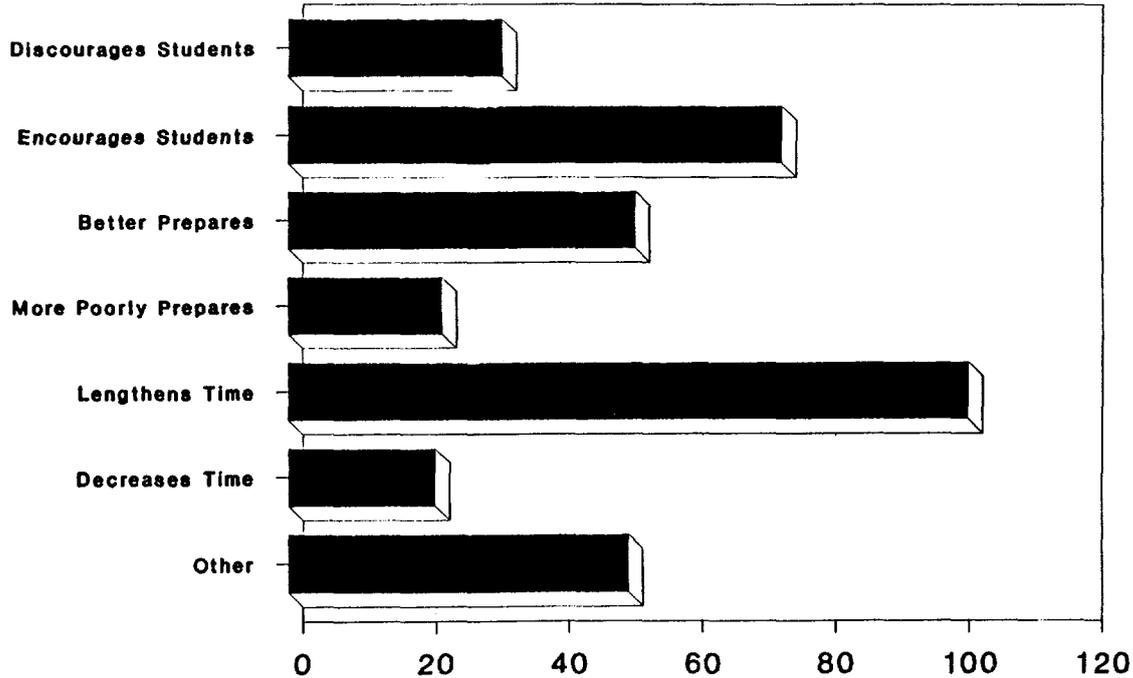


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OPEN FORUM  
EXHIBIT 17

# Effect of Changes in Syllabus

## Number of Respondents Indicating



## OPEN FORUM

Factors affecting the *role* of actuaries are being rated on a scale from -5 to +5, as to their effects in the last 5 years as well as their potential impact in the next 5 years. A number of factors have been listed, and it is difficult to generalize. The 15 factors are employee benefits consulting, computer technology, research, government regulations, marketing, effects of the economy on our products, asset management, investment products, interest sensitive products, expert witness, teaching, mortality and morbidity studies (including the study of AIDS), the quality of MBAs, decentralization, and mergers and acquisitions.

1. According to Exhibit 19, computer technology seems to have significantly affected what an actuary does. However, its impact is expected to lessen in the next 5 years. It is followed by such factors as employee consulting, government regulations, asset management and, to some extent, expert witness and mortality and morbidity studies.
2. Government regulation and asset management are two factors considered to have the biggest potential impact on the role of actuaries in the next 5 years, even more so than in the last 5 years.

MR. TEPFER: The 15 categories that Kin mentioned are the same in this group as in the insurance companies (Exhibit 20). The changes in government regulations over the last five years came out with the highest average, at 2. Next is employee benefits consulting. The rest of the categories have some impact, but not great, and when you get into something like decentralization of insurance companies, a 0 was the rounded average. Looking over for the next five years, again government changes and government regulations are expected to have the greatest impact. It is interesting that two categories that follow are asset management and interest products, a little different than for the past five years. It shows that there could be some changes ahead for consulting firms and insurance brokers.

MR. TAM: The factors affecting the number of actuaries in insurance companies (Exhibit 21) are slightly different. There are legislative changes, government reporting, types of products, changes in retirement plans, changes in employee benefits, corporate reorganization, the role of actuaries in insurance companies, software development, marketing, investment products, changes in the economy, mortality and morbidity studies, the quality of MBAs, decentralization, and mergers and acquisitions. On the whole, external factors (which include legislative changes, government reporting and changes in the services provided by companies such as retirement plans and employee benefits) seem to have had a greater influence in the past than internal factors, such as corporate reorganization, mergers and acquisitions and decentralization.

The negative average scores on some factors are shown as zero on the graph because they happen to be very close to zero.

If we compare the right-hand side of Exhibit 21 with the left-hand side, we can conclude that the factors deemed to have had a significant impact in the last 5 years are generally expected to have the same if not greater influence in the next 5 years. The only minor exception is mergers and acquisitions.

MR. TEPFER: Exhibit 22 is the same for consultants and brokers as for insurance companies. The factors affecting the numbers of actuaries both in the past and in the future are changes in legislation, government reporting, and retirement plans. Looking ahead to the future, those categories are still high. The retirement plan category has dropped off just a little bit.

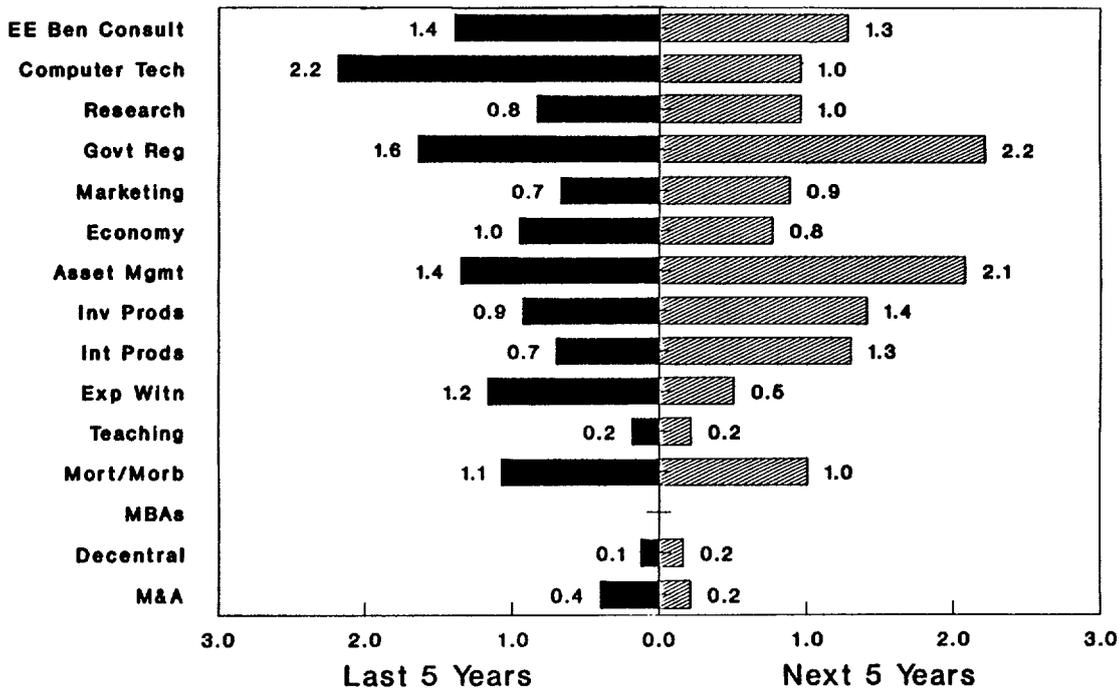
It is interesting that changes in the types of products are expected to change the number of actuaries in consulting firms and insurance brokers. The change in investment products is again shown to be something that is expected to have an impact on the number of actuaries.

MR. TAM: One other question was raised within the survey of universities and colleges only. The question was to compare actuarial students with other majors with respect to mathematical ability, communication skills, career-mindedness, computer ability and well-roundedness. In the opinion of most respondents, actuarial students seem to have more mathematical ability and career-mindedness than other majors.

MR. DARYLE G. JOHNSON: The Actuarial Recruiting and Minority Survey was conducted under the auspices of the Career Encouragement Committee, whose primary objective is to

# Changes in Role of Actuaries Insurance Companies

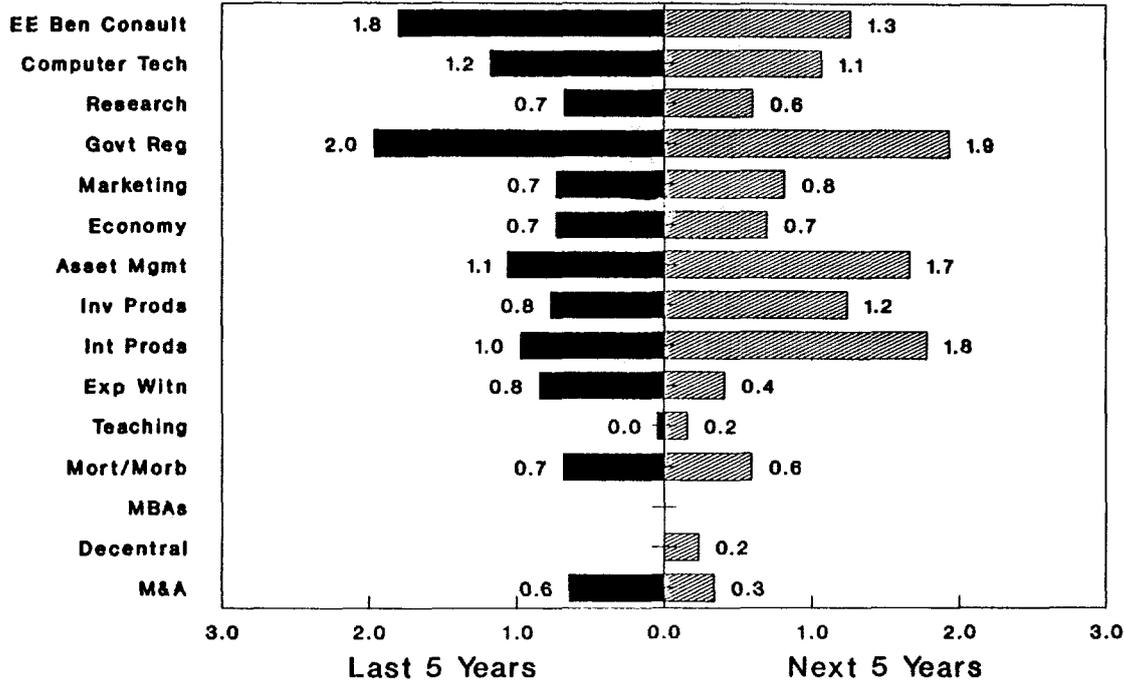
Scale: -5 to +5



MARKET FOR ACTUARIES  
EXHIBIT 19

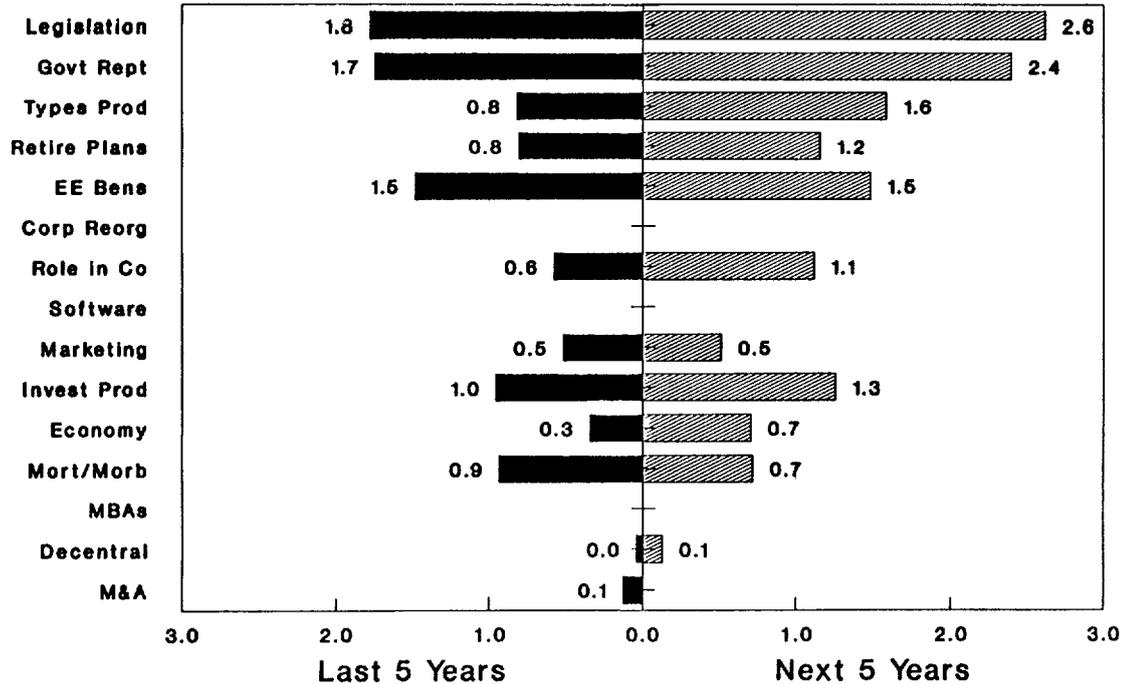
# Changes in Role of Actuaries Cons Firms & Ins Brokers Combined

Scale: -5 to +5



# Factors Affecting Number of Actuaries Insurance Companies

Scale: -5 to +5

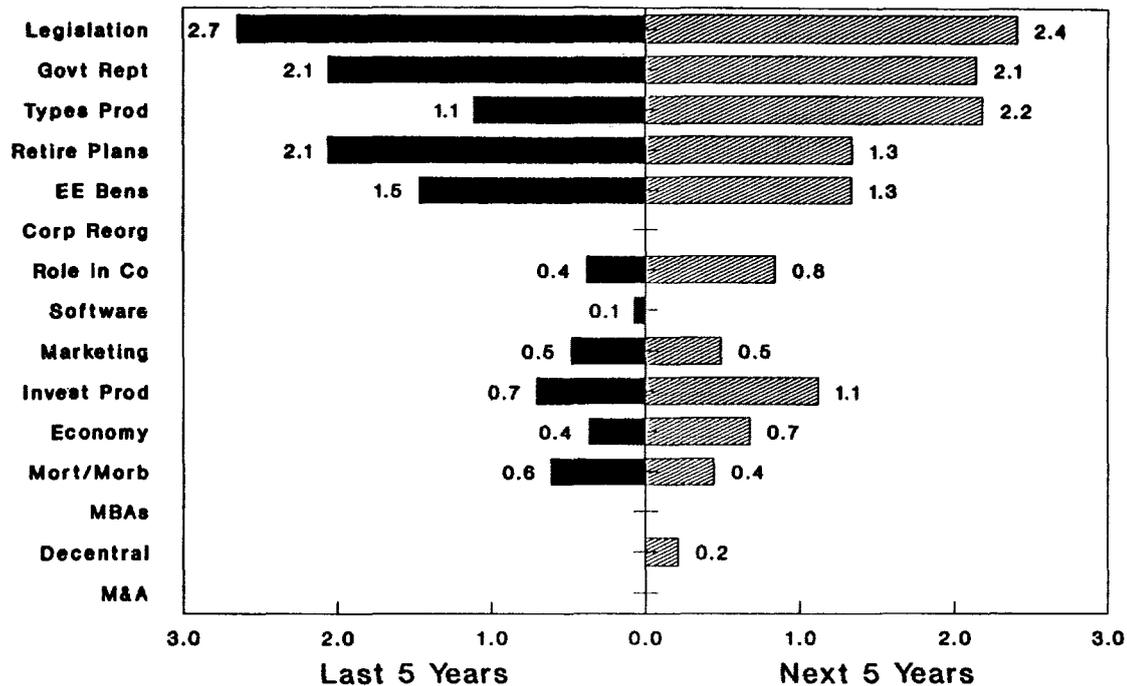


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MARKET FOR ACTUARIES  
EXHIBIT 21

# Factors Affecting Number of Actuaries Cons Firms & Ins Brokers Combined

Scale: -5 to +5



## MARKET FOR ACTUARIES

encourage new people to enter the actuarial field. One of the purposes of this survey is to get a picture of our efforts to get people into the field, particularly the minorities. We conducted a recruiting and minority survey that covered recruiting in calendar year 1988. This particular survey included only insurance companies, consulting and brokerage firms and governmental agencies. It did not include the other employers that were included in the rest of the survey. As you can see below, it covered 727 employees hired in 1988 and it covered a total staff of about 4000. The breakdown is as follows: FSAs about 25% and Associates 20-25%. There were two similar surveys conducted several years ago. We will compare the three surveys.

### ACTUARIAL RECRUITING AND MINORITY SURVEY

- o Conducted in Summer of 1989
- o Covers recruiting in calendar year 1988 and staffing as of January 1, 1989
- o Survey Covered  
169 Insurance Companies  
74 Consulting and Brokerage Firms  
11 Governmental Agencies
- o Surveyed covered 727 new hires in 1988
- o Survey covered total staff of  
1,537 FSAs  
1,017 ASAs  
1,428 Students

Exhibit 23 looks at a breakdown between non-minority and minority of the total staff as of January 1, 1989 (the total staff being covered by the survey). As you can see, minority is 10% and non-minority is 90%. Blacks are 2%, Asians are 6%, Hispanics are 1%, and Others are 1%.

Exhibit 24 shows the same data broken down by examination level. Among Students minority representation is 13%, among Associates it is the same number, 13%, and among Fellows it is 4%.

Exhibit 25 shows the same data by employer. Among insurance companies minorities are 10%, among consultants and brokers minorities are 6% and among governmental agencies minorities are 13%.

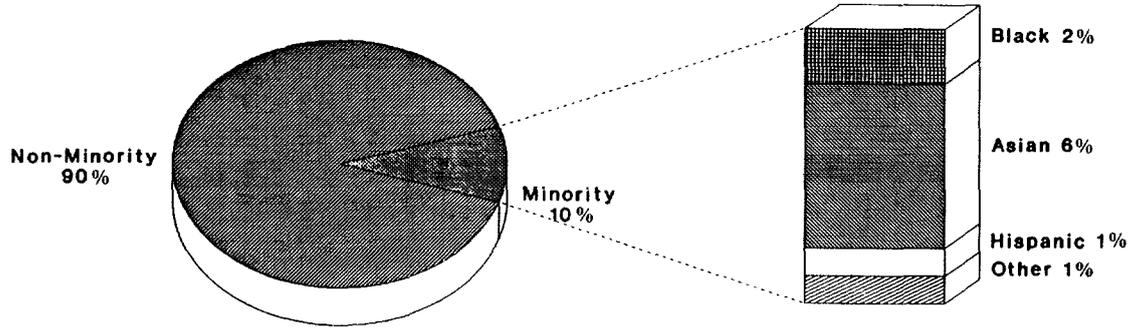
Exhibit 26 takes these same data and shows a combined breakdown by exam level and employer. The breakdown for employer ranges from 11-14% for Students. For Associates, it ranges from 5-15%. Among Fellows the range is from 1-5%. The following is a breakdown of total staff as of January 1, 1989. We also looked at new hires in 1988 (Exhibit 27). Remember from the previous exhibit that 13% of the total student staff as of January 1, 1989 were minorities.

That is the same breakdown for new 1988 student hires (3% Black, 8% Asian, 1% Hispanic, and 1% Other). How would these data compare with Society membership at large? The answer is that we don't know. The data are not available. The next question would be how would these data compare with the data from the general population. And there, we don't know either. However, the minority representation here is quite a bit less than the population at large.

Exhibit 28 compares the 1988 data with what we saw in the prior two surveys. In the 1986 survey, the total proportion of new Students hired who were minority was 12% as compared with 13% in the present survey. In the 1985 survey, it was 13%. The thing to note is that there is no noticeable increase in this recent survey.

Exhibit 29 is similar, but we look at data for people who sat for one or more actuarial exams in the May examination. This would be combined data for newly hired students who wrote an exam in May, people who are not yet Associates who took an exam, and Associates who wrote one or more Fellowship exams. The minority representation is 14% (Blacks 2%, Asians 9%, Hispanics 1%, Others 2%). Again it is very close to the 13% number we have been looking at.

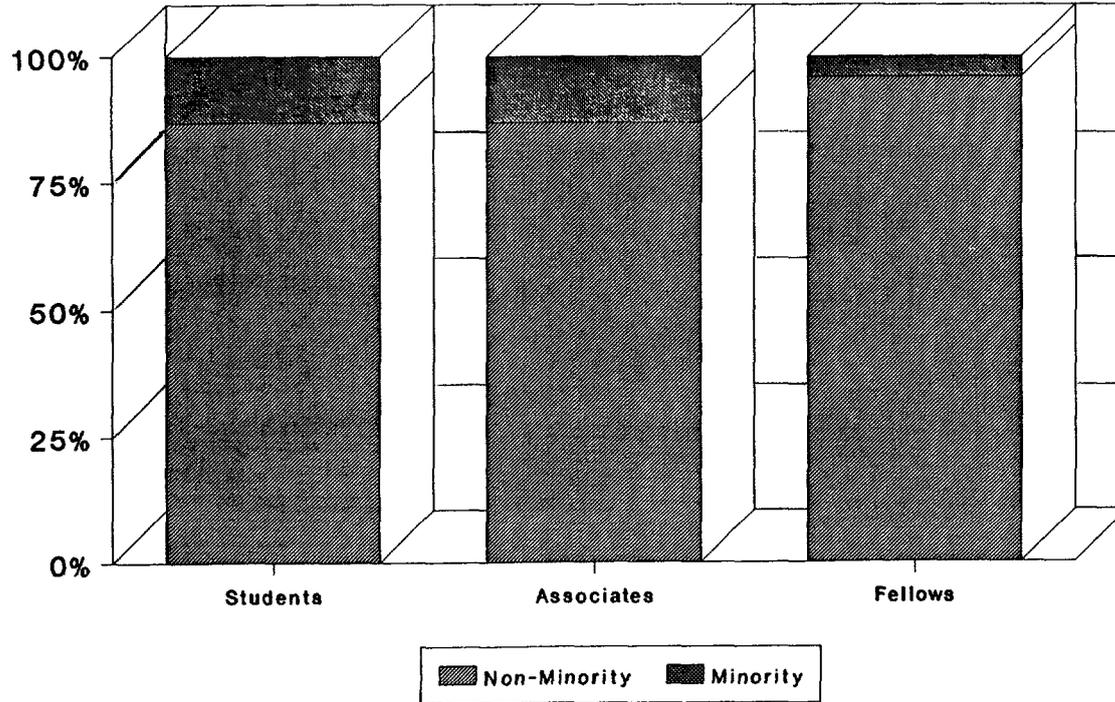
# EEO Classification of Total Staff as of January 1, 1989



1300

OPEN FORUM  
EXHIBIT 23

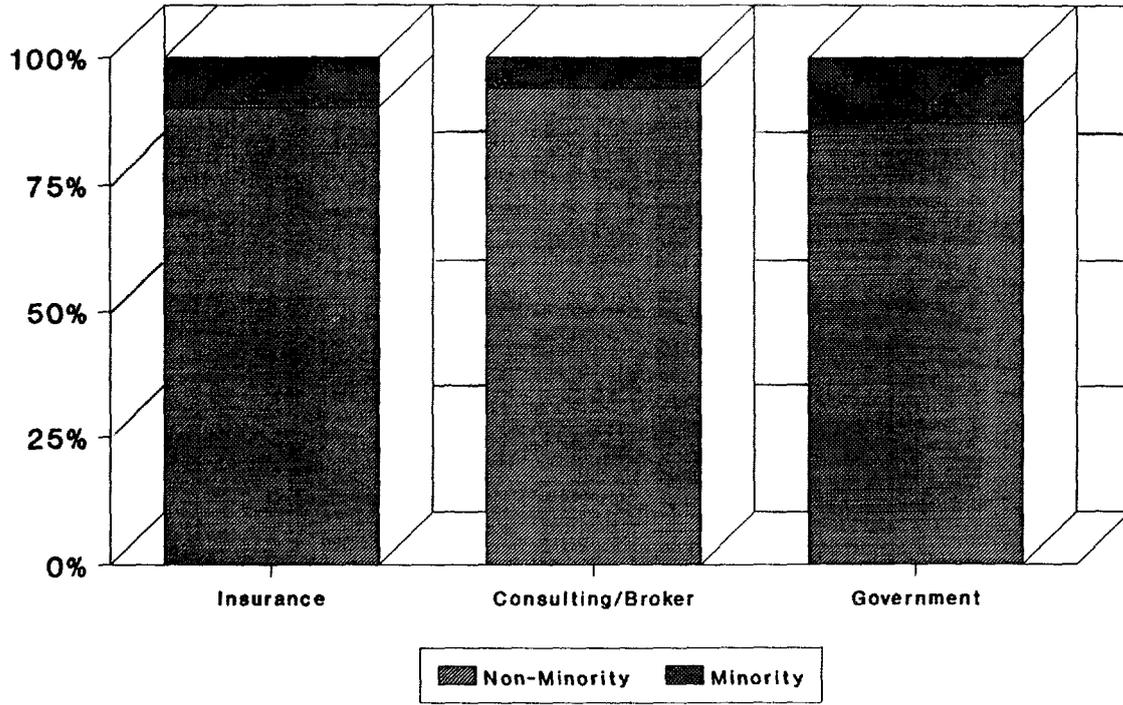
# EEO Classification by Exam Level as of January 1, 1989



1301

MARKET FOR ACTUARIES  
EXHIBIT 24

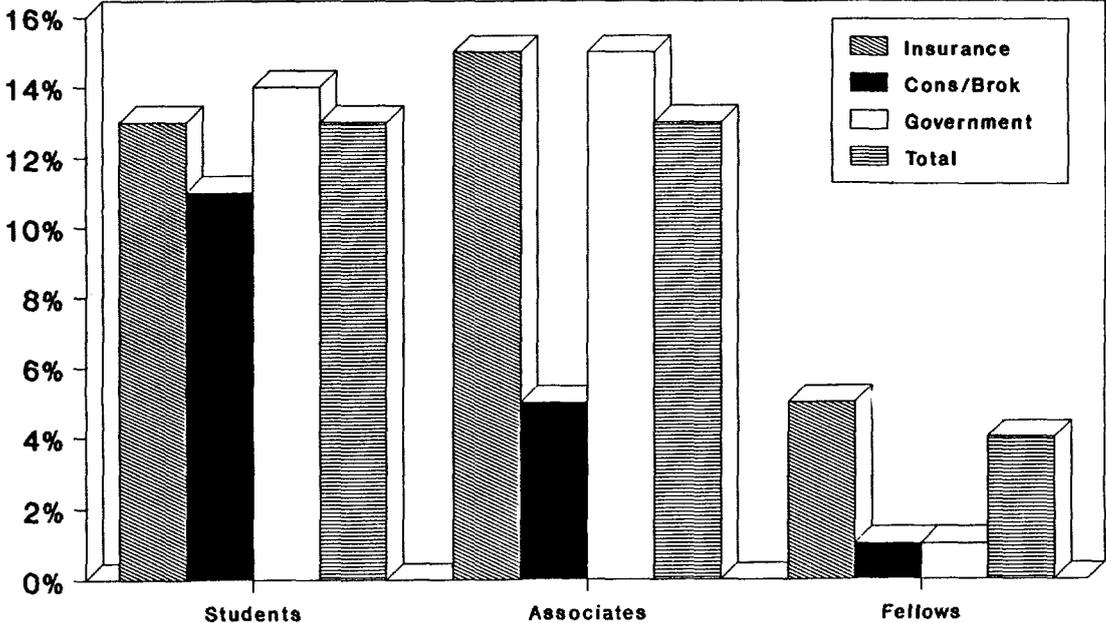
# EEO Classification by Employer as of January 1, 1989



1302

OPEN FORUM  
EXHIBIT 25

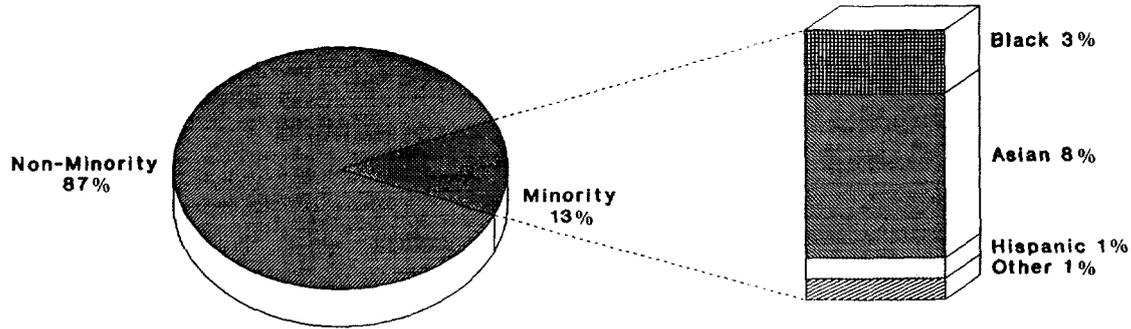
# EEO Classification: Exam Level/Employer Percentage of Minorities as of January 1, 1989



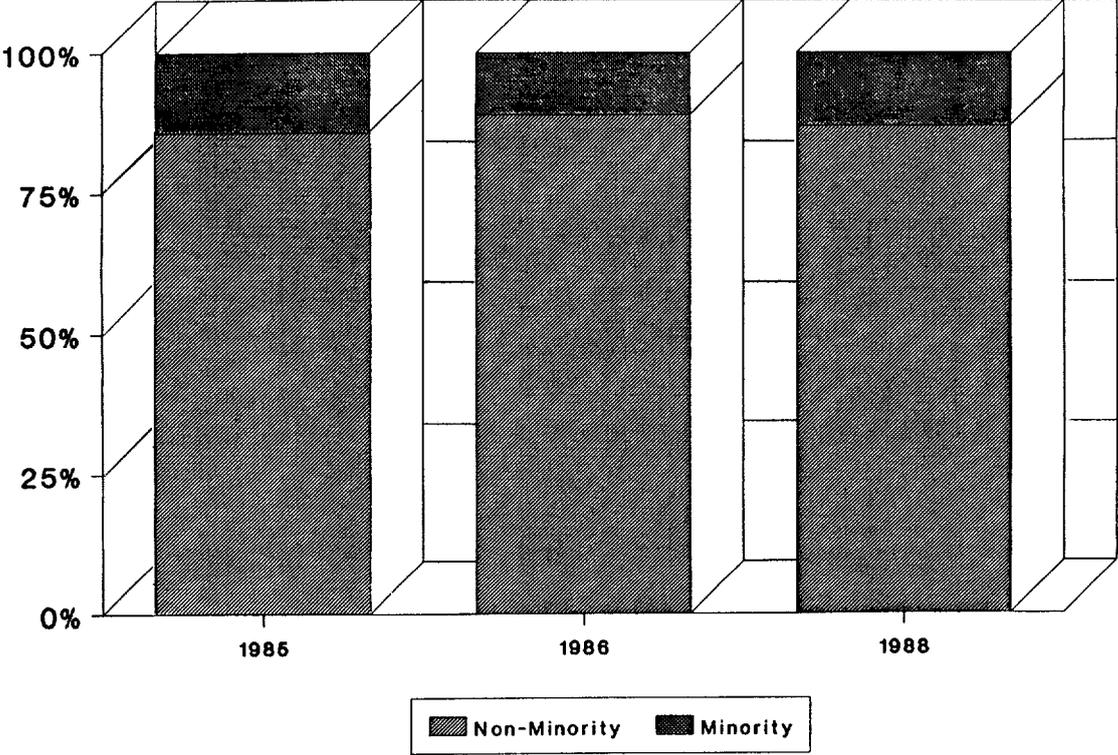
1303

MARKET FOR ACTUARIES  
EXHIBIT 26

# New Students Hired in 1988



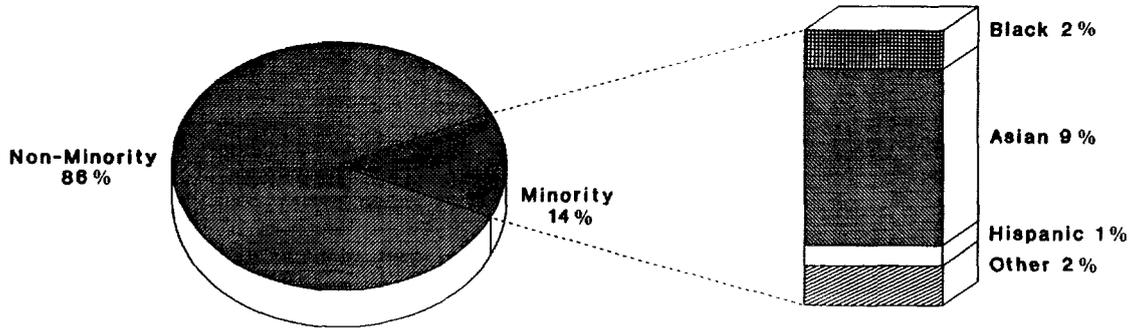
# New Students Hired During Year



1305

MARKET FOR ACTUARIES  
EXHIBIT 28

# Candidates Sitting for Exams May 1989



1306

OPEN FORUM  
EXHIBIT 29

## MARKET FOR ACTUARIES

MS. BRYANNA COWEN\*: Are those people working necessarily?

MR. JOHNSON: Yes they are, and the reason is that we sent the survey to companies, brokers and consultants, and governmental agencies with respect to their staff. There might be a few people who were employed at the time of the exam and not employed when the survey was taken.

Exhibit 30 compares the total staff as of January 1, 1989 with similar data that were shown in the prior two surveys. As of January 1, 1986, there was a minority representation among total staff of 6%. As of January 1, 1987, it had increased to 7%. This survey shows that it was 10% as of January 1, 1989. So the thing to note here would be that there is a trend that has gone from 6% to 7% to 10% with respect to minority representation among total staff included in these three surveys.

As a part of this, we also asked a couple of questions with respect to a breakdown between male and female (Exhibit 31). Among Students as of January 1, 1989, 41% were female. Among Associates, females were 26%; among Fellows, females were 13%. In aggregate, females represent 26%.

Exhibit 32 is similar and shows a breakdown between males and females with respect to Students hired during the year. We are comparing data here with what was shown in the prior two surveys. In 1985, 37% of the new students hired were females; in 1986, it was 44% and in 1988, it was 43%. You don't see an increase from 1986 to 1988, but I think one thing to note would be that if you look at the 1988 data among new hires, 43% of them were females. On the prior exhibit 41% of the Student staff as of January 1, 1989 were female, so this would indicate a continuing trend in the proportion of females.

This completes the minority and recruiting part of the survey, and I think the things to note would be that there is really nothing dramatic, but minorities and females are continuing to increase relatively.

MR. MUSEN: I imagine some of the people here are probably involved with recruiting and would have an interest in these figures. So basically at this point, this is an open forum, and we encourage people to enter into a discussion with either the panel members here or with others in the audience.

MS. PHYLLIS N. ROGERS: One of the things that I noticed was that among the minorities, a high proportion are Asians. I wonder if you have any figures indicating the breakdown between foreign-born non-whites and native born. In other words, I think in terms of our efforts to recruit minorities, focusing primarily on the American educational system and people coming up through high schools, etc., I wonder if our results are perhaps a little less glowing than they appear. More of the people coming in -- many of these minority students -- didn't come through that high school system, but came to us at the college level or later.

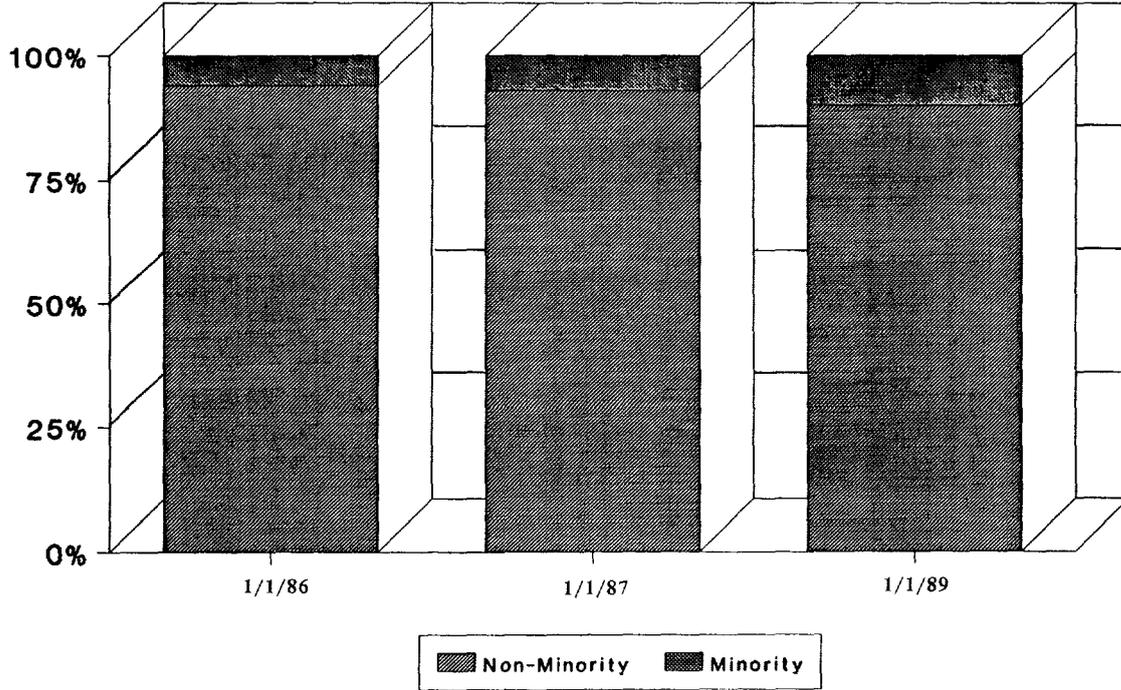
MR. MUSEN: It's an interesting question; Daryle, do you want to respond to that?

MR. JOHNSON: Well yes -- that could well be a very valid point. I can only tell you that from the way we asked the question and the data that we gathered we do not have that breakdown. And I think we ought to make a note that with respect to future surveys there's something we might do there to improve it. We did not get a breakdown at all of those data.

MR. MUSEN: On the topic of minority recruiting, as I believe Daryle mentioned during his presentation, there is a subcommittee on minority recruiting which is under the umbrella committee of the Career Encouragement Committee of which all of us on the panel are members. The minority recruiting committee is involved in several activities to encourage minorities to pursue the actuarial profession. They attempt to gain funding from member firms of the SOA for several minority programs that are offered at colleges and universities in the U.S. There's a program at Howard University in Washington, D.C., which I believe is in its seventh or eighth year. That's a three-week program for high school students with a math inclination. It's offered to about 50 students a year and it's funded by the Society through gifts that are made by member companies

\* Ms. Cowen, not a member of the Society, is an Actuarial Recruiter for Fanning Executive Placement Service in New York, New York.

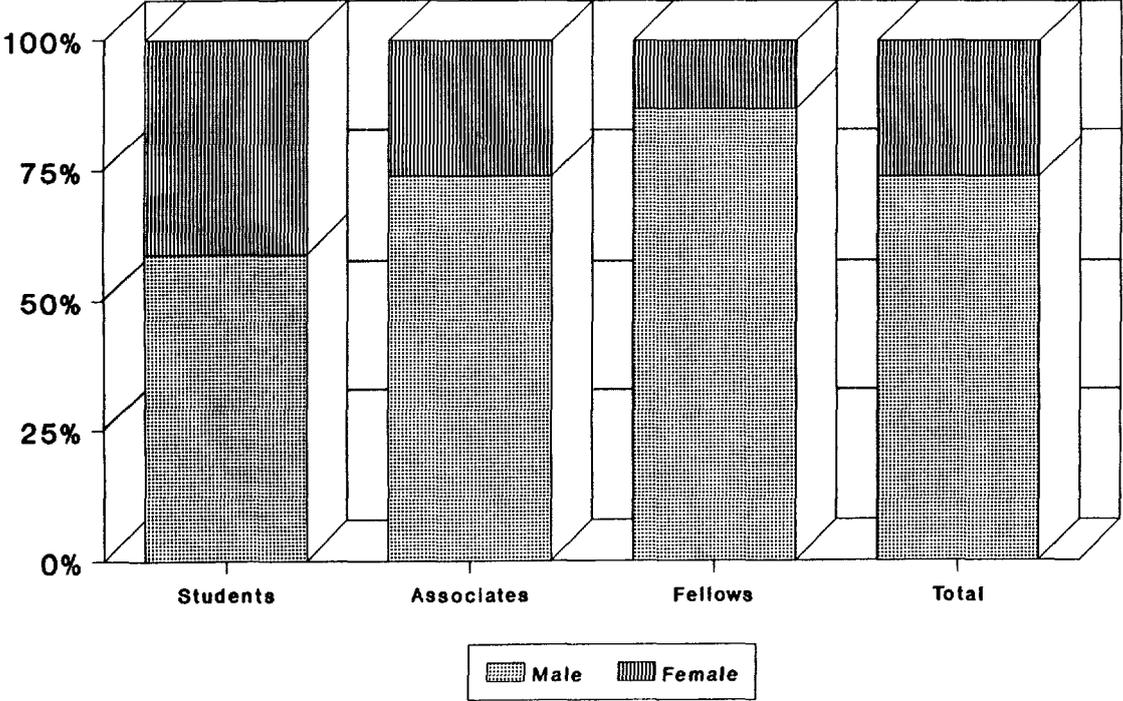
# Comparative Minority Classification for Total Staff



1308

OPEN FORUM  
EXHIBIT 30

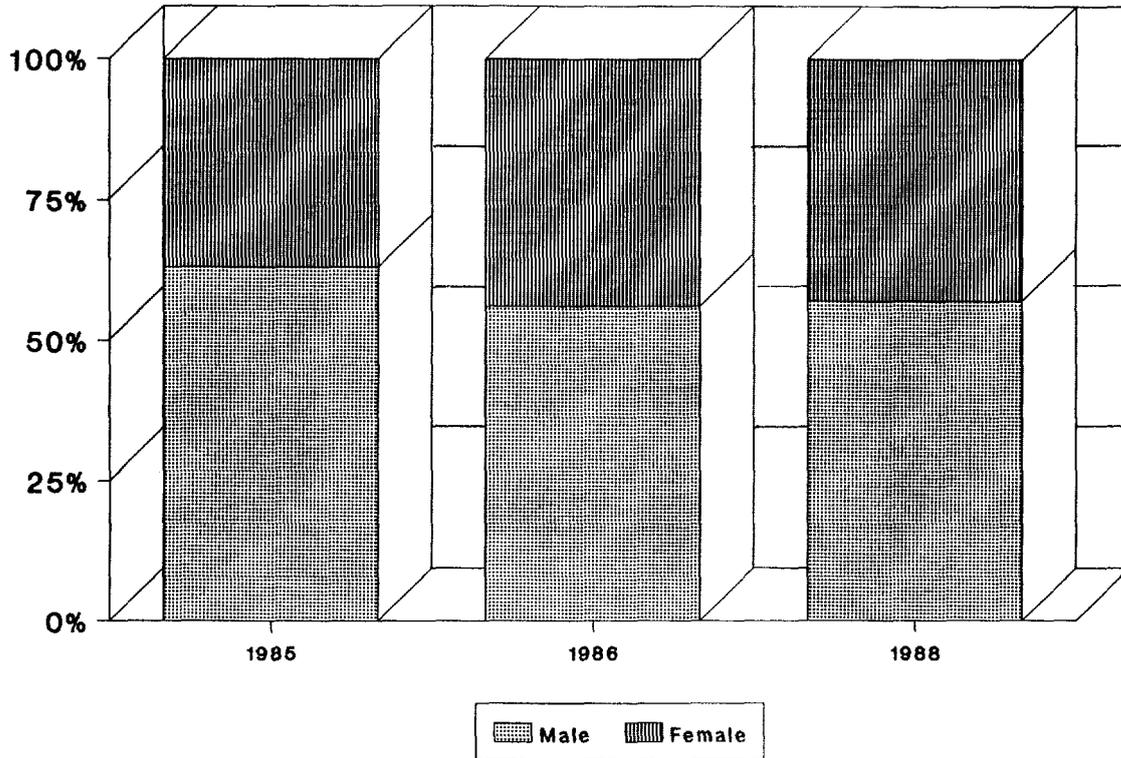
# Sex Distribution of Total Staff as of January 1, 1989



1309

MARKET FOR ACTUARIES  
EXHIBIT 31

# New Students Hired During Year



1310

OPEN FORUM  
EXHIBIT 32

## MARKET FOR ACTUARIES

and roughly costs the Society \$45,000-\$50,000 a year. There's another program at Florida A&M. It's a much smaller program. I think it's either in its first or second year, and it's modeled after the pilot program at Howard. I think it had 10 or 15 students. I believe there's one other program but it slips my mind at the moment.

In addition, the Society provides scholarship funds to several qualified minority candidates every year and you might be interested to know that the Board of Governors of the Society has asked the question or raised the issue about whether or not the Society is getting "bang for the buck." I was specifically asked that question about a year and a half ago at a Society Board of Governor's meeting, and I'd be more than willing to discuss that with anybody here.

My basic response was that, as actuaries, we know that such a trend is difficult to track after three or four years. A lot of these people are still in college; you would expect it would take quite a while to cultivate an interest in the profession, especially among talented minorities who would have opportunities in other professions with what we might call a "shorter pay-back period." In addition, as you saw in the survey, one of the questions that was asked about the changes in the syllabus was how long it would take people to become Fellows or "productive." That was the one response that had the most number of people saying that it would increase the time to Fellowship. Now, that would not have had much of an impact in prior years, since these programs have only been in effect for five or six years, we would not expect too many high school students to have yet become Associates or Fellows. Also, to the extent that we might loosen our standards to allow these people into actuarial programs and fund them because of deprived backgrounds, we might further expect that period to be lengthened. Now, with the change in the syllabus that might lengthen it even further. The question becomes whether or not that one fact discourages minority students from pursuing the profession if the payback period is now even longer.

But as far as bang for the buck, my own personal feeling, and this is not that of the Society or of the other members here, is that \$50,000 is very small and what I would call a token effort by the Society, and one should not be surprised by the number of minorities as a result. I think the actuarial profession is somewhat obscure to start out with; that's why many of us on this committee are trying to encourage it and probably more so to someone from a minority background. But I would be more than willing to open the floor to discussion on that since the minority recruiting subcommittee is a sister subcommittee to the other two subcommittees that are represented on this panel.

Are there any other questions or comments?

MR. RICHARD S. FOSTER: Several of the exhibits showed the future growth and demand for actuaries. But demographically speaking, the bulk of the baby boom has already entered the labor force and future cohorts are not going to be growing as quickly as they were in the past; they might even go down. I'd be interested in the comments from the panel members and perhaps others in the audience as to whether we've already begun to feel this crunch of not enough supply of new actuaries and what your companies are doing about it.

MR. MUSEN: Would anybody on the panel like to comment?

MR. JOHNSON: Well in the case of our own company, Pacific Mutual Life Insurance Company, we do have an increasing demand for actuaries. We are not really having any difficulty in finding qualified talent. There are always exceptions to any generality, but that's really the situation at Pacific Mutual. I really don't have the statistics, but it hasn't hurt us at all that the job almanac rated the profession as one of the best; in fact number one. And I believe the people who have been registering for the early examinations are at an all-time high, so I don't think we really have a crunch or a large disparity between demand and supply in the near term.

MR. TAM: I'd like to second what Daryle has said already. It's something that was implicit in the first exhibit. We have looked at the growth in the Society membership for the last 12 years or so. The annual growth rate is about 5.5%, while we are projecting a 6.5% growth rate in overall demand. On the basis of this projection, I don't think we're going to have a critical shortage. I think supply and demand are keeping pace with each other quite well. The market for Actuarial Students, Associates and maybe Fellows is not a particularly efficient one and there are instances where there may be a shortage of a particular qualification. Sometimes we can be very specific as to what we need to fill a position, and it may take us a long time to find an appropriate candidate.

## OPEN FORUM

But overall I'm not so sure if that is a very big imbalance. I'm glad that Daryle mentioned the situation with the Course 100 enrollment. In fact, I think it has been on the increase, very noticeably over the course of the last six or so years. But I don't think it has resulted in an acceleration in the Society membership. There may have been a high dropout rate among students after passing Course 100.

MR. MUSEN: There's only one exhibit that we showed which addresses this question: the question asking the effect of the changes in the syllabus. We got a higher response of people saying that it encourages students to pursue an actuarial profession than it discourages them. So, I believe that it is a fact that this is the first year in many that Metropolitan does not have a need for any actuarial students. We will probably hire a few just to keep them in the bank, but there are no areas of the company that are saying they are having a shortage of actuarial students. Now, that's an insurance company perspective. It would be different at consulting firms and certainly in the government for the reasons cited in some of the earlier exhibits. If, in fact, some of the problems have to do with salary, all those shortages may persist even though there's a surplus in some of the other fields of employment. But maybe we should throw this open to the floor and some other companies who are represented here might want to say something about their shortages or lack thereof in the quality and quantity of their candidates.

I think we have a question on the quantity and quality and I think that one of the graphs shows that the quality is improving a little bit; the quantity was improving quite a bit over the last five years. To sort of elaborate on what Daryle said from a layman's point of view, at Metropolitan, I believe that it is a fact that this is the first year in many that Metropolitan does not have a need for any actuarial students. We will probably hire a few just to keep them in the bank, but there are no areas of the company that are saying they are having a shortage of actuarial students. Now, that's an insurance company perspective. It would be different at consulting firms and certainly in the government for the reasons cited in some of the earlier exhibits. If, in fact, some of the problems have to do with salary, all those shortages may persist even though there's a surplus in some of the other fields of employment. But maybe we should throw this open to the floor and some other companies who are represented here might want to say something about their shortages or lack thereof in the quality and quantity of their candidates.

MR. JOHNSON: There is a statistic that might be of interest which I think is relevant. I just happen to have here the Society membership data. This only covers a one-year period but it did increase from November 1 of 1987 to November 1 of 1988 by 561 individuals and that's the net increase due to all causes and that's out of a membership of about 10,500, so it would be about 5.5% increase in membership. That's not measuring the increase in the number of new students being recruited. This is just among Fellows and Associates, of course.

MR. ARTHUR L. BALDWIN, III: My impression based on the exhibits presented is that we have not only a recruiting issue but also a retention issue, both with respect to minorities and with respect to females. My question is do you agree with this observation? If so, do you think that the steps that have been taken with the flexible education syllabus will improve that and if not, what do you think the Society should do?

MR. JOHNSON: What was the basic premise?

MR. BALDWIN: If you look at the recruits over time both with respect to gender and with respect to racial status, the proportion of females decreased -- the proportion of females for Students was higher than the proportion of females for Associates which in turn was higher than the proportion of Fellow females.

MR. JOHNSON: That would not be unexpected.

MR. BALDWIN: It may not be unexpected. My question to you is whether you think the Society has taken steps to improve that situation and if not what you would recommend?

MR. MUSEN: The interpretation that I would give to that is that in the past there had been less effort to get females in particular into the profession as indicated by the smaller percentage of females that are FSAs. They would tend to be older; the females who are Associates would tend to be somewhat younger and so this would indicate that more women are getting into the profession and even more so in the Student level as opposed to trying to draw a conclusion about retention, which may also be valid. But the way I would draw the conclusion is that it is more a time consideration as opposed to one of retention.

MR. JOHNSON: Well, I would have the same conclusion. The only feedback I really have is that if you look at similar surveys, you will find that over the years we have been recruiting more and

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more females into the profession relative to the total number being recruited. And indeed it shows here in this survey that in 1988 we recruited 43%. If we use the word minority, and project this out, it may well be that with where we are going to be recruiting in the future, females will be the majority. That could well go over 50%. Beyond that, I don't have a feeling that the Society has done a poor job in its efforts to recruit females into the profession. With respect to minorities, I think there is probably more that we could do.

MR. MUSEN: Once someone becomes an FSA, he or she is unlikely to pursue another career. I don't know how many of us in the room have known an actuary who has pursued some career where the designation didn't help him. Now, there are probably a couple, but I don't think the profession as a whole has had a retention problem when somebody has made it all the way through the exams. On the other hand, there's probably lots of movement, and the situation is fluid. But, as a net result, that's not a retention problem for the profession. There may be a net retention problem for a particular company or a particular specialty within a firm or company, but again that's my personal opinion.

MR. MICHAEL M. BRAUNSTEIN: Does your committee know of companies who are currently willing to sponsor students who have neither U.S. citizenship nor permanent residency status, and are you aware of any lobbying effort on the part of the Society to encourage companies to create some sponsorship programs?

MR. JOHNSON: Well, I'm not aware of any efforts on the part of the Society to sponsor any programs like that. I am aware of a company that does that however, Pacific Mutual.

MR. TAM: I think that is an individual company decision. I know of companies that sponsor nonresidents or noncitizens with great results. On the other hand, there are companies which have made it their policy not to do so for very good reasons. I remember one instance where somebody took about two years to get his green card to join a major mutual company. But shortly after all that was done, he found it impossible to stay. You can go through a lot of legal work to achieve nothing. I don't think that is sufficient reason to terminate such a policy. On the other hand, it is a cost benefit question that one has to weigh and I think if you have had one or two bad experiences you are maybe discouraged from doing the same thing again. However, I have come across a lot of very good candidates -- people who could pass five exams in the course of one year, who had trouble getting employment for one and only one reason -- the fact that they did not have a green card.

MR. ROBERT B. BROWN: To get a little different flavor, I am at Ohio State University. As you may know the actuarial programs in U.S. universities have grown quite a lot over the past three years, possibly because of the great publicity that actuaries have gotten and many of the programs are bursting at the seams. The people who are at the universities keep fairly close touch with each other and all the programs are quite large. I anticipate that universities will want to hire additional faculty in their actuarial programs in the coming several years and this will be a real tough role to fill. One of the reasons, of course, is because a Ph.D. is required for permanent faculty status at almost all universities so this cautions us against overinterpretation of the bar graph which showed that Ph.D.s were not desired in the actuarial profession. At least I hope it does because another part of the bar graph showed that 24% of the new hires last year were from university actuarial programs. So there's a potential serious bottleneck there and not because of the availability of students but because of the availability of faculty to staff the program. I don't speak anecdotally as an individual faculty member, instead I speak as one of the associate deans of science and mathematics involved in the hiring and promotion process at the university.

MR. TAM: Let me take this opportunity to make an observation about universities and colleges surveyed. As a group they had the highest response rate to the survey. Many responding professors offered write-in comments that were quite helpful to us. As far as the desirability of Ph.D. candidates is concerned, the panelists were somewhat surprised by the responses. I can speak from my experience that many Ph.D.s who have adopted the actuarial career have done quite well. But I think maintaining a great deal of actuarial interest within academia can be a problem. Unlike law or medicine, the furthering of the frontier of actuarial research is not pursued very vigorously within academia. There is not a great body of research-oriented academics to push the actuarial frontier ahead. This can be a problem. As noted in some responses, the fact that in the academic environment you need a Ph.D. to gain acceptability by colleagues can present a problem to somebody who is just an FSA. I don't know what we can do about that.

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MR. TEPFER: I just want to point out a couple of comments about the bar graph showing the demand for Ph.D.s -- I think for the most part unless we said otherwise, the graph showed insurance companies and consulting firms and brokers and occasionally governmental firms. But that did not show what they expected, what their current population of fellow students and associates expected it to be, and I think we got responses from 23 colleges and universities and the expected growth rate was actually a negative .7 per year for the next 5 years. They are really small numbers -- there are 47 currently employed and they expect 46 to be employed 5 years from now. We didn't put that statistic in the exhibits.

MR. JAMES R. BEAUCHAMP: One of the things I noticed in the stuff on college and universities -- it seems like they generally rated their actuarial people very well, including communications which seems to be a particular concern of our profession right now. Do we have any way of telling whether that's a recent change now that we have more and more people coming into the profession -- are we getting better communicators or is it maybe that in general college students are judged differently on their communication skills? I just wondered if any of you had any comments on what that meant exactly? It seems like they rated them quite well.

MR. TEPFER: We did ask when people hired entry level staff how important different categories were. When we asked them how well students or entry level people met the expectations that were set for them on a scale of 0-10, the results for communication skills came at about 6-6.5. It was about in the middle of the scores. The one thing that you have to keep in mind when looking at these exhibits is that we asked them how well expectations were met but we didn't ask them what the expectations were so we don't know if they were hoping that somebody would come in and be able to read and they could indeed read or if there was something a little more than that.

MR. GREGORY TODD SWIM: Just one quick comment on the university programs. I know, for instance, that the University of Illinois has had a terrible time attracting and retaining qualified people to teach actuarial programs and I think one of the biggest challenges and perhaps one of the reasons why in the survey you saw a net decrease among universities is that it's extremely hard to retain people who have attained Fellowship in private industry where the pay scales are so much beyond what a university can offer. It's very doubtful that universities are going to be able to attract highly qualified candidates to teach university courses.

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APPENDIX A

1989 Survey of Employers of Actuaries  
Aggregate Results Among 14 Governmental Employers Completing the Survey

TABLE A

<u>Type of Work</u>	<u>FELLOWS</u>		<u>ASSOCIATES</u>		<u>STUDENTS</u>	
	<u>Employed</u> <u>6/1/89</u>	<u>Required</u> <u>1/1/94</u>	<u>Employed</u> <u>6/1/89</u>	<u>Required</u> <u>1/1/94</u>	<u>Employed</u> <u>6/1/89</u>	<u>Required</u> <u>1/1/94</u>
<b>Federal</b>						
1. Social Security Program/GPP	3	3	2	3	0	0
2. Internal Revenue Service/Rev. Can.	0	0	0	0	0	0
3. Other Fed. Dept.	4	6	8	12	36	39
<b>State, Provincial and Municipal</b>						
1. Insurance Dept.	19	24	16	18	15	22
2. Retirement System	6	6	9	10	6	7
3. Other Depts.	3	3	2	4	0	0
4. Other	0	0	0	0	0	0
	<u>35</u>	<u>42</u>	<u>37</u>	<u>47</u>	<u>57</u>	<u>68</u>

OPEN FORUM

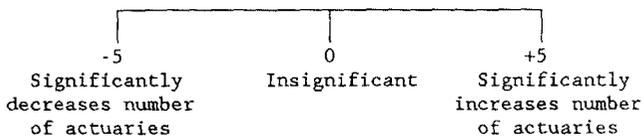
APPENDIX A

(Continued)

1989 Survey of Employers of Actuaries  
Average Results Among 14 Governmental Employers Completing the Survey

Changes in the Number of Actuaries

For each of the categories shown below, please indicate whether this has been or will be a significant or insignificant factor influencing the demand for actuaries. Please rate on a scale of -5 to +5 as follows:



<u>Factor</u>	<u>Last 5 years</u>	<u>Next 5 years</u>
	(Average Among Responses)	
Changes in legislation	2.1	1.7
Changes in government reporting requirements	1.5	2.0
Type of insurance products sold	.9	1.4
Changes in retirement plans	1.2	.8
Changes in employee benefits	.7	.5
Corporate reorganization	.8	.4
Changes in the role of the actuary within the company	1.7	.9
Availability of actuarial computer software	.4	0
Changes in methods used to market products	.3	.3
Changes in investment products	.6	.7
Effect of economy on insurance products	.8	.9
Mortality/morbidity trends	1.0	1.0
Quantity and quality of MBAs	.6	.4
Decentralization of insurance companies	.3	.2
Merger & acquisition trends	.1	-.4

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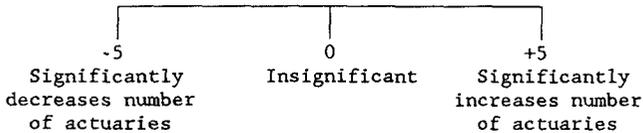
APPENDIX A

(Continued)

1989 Survey of Employers of Actuaries  
Average Results Among 14 Governmental Employers Completing the Survey

Changes in the Role of Actuaries

For each of the categories shown below, please indicate how the following factors have influenced or will influence the role of actuaries. Please rate on a scale of -5 to +5 as follows:



<u>Factor</u>	<u>Last 5 years</u> (Average Among Responses)	<u>Next 5 years</u>
Changes in employee benefits consulting	1.1	.3
Computer technology	1.3	1.1
Amount of research performed	1.0	2.1
Government regulations	1.9	2.4
Marketing of insurance products	.4	.4
Changes in economy	1.1	1.3
Emphasis in asset management	1.0	1.7
Changes in investment products	.7	.7
Growth in interest-sensitive products	1.7	1.0
Expert witness testimony	.7	1.3
Teaching trends	0	0
Mortality/morbidity trends (e.g., AIDS)	1.3	1.5
Quantity and quality of MBAs	.6	.5
Decentralization of insurance companies	.3	.3
Merger & acquisition trends	.4	-.3

OPEN FORUM

APPENDIX A

(Continued)

1989 Survey of Employers of Actuaries

Aggregate or Average Results Among 14 Responding Governmental Employers

Sources of New Actuarial Staff

1. What are your present main sources of new actuarial staff? Please indicate in the first column the number of hires from each source in the last 12 months; in the middle column, how these sources have changed in the past (on a scale of -5 to +5); and in the right column, how you expect these sources to change in the future (on a scale of -5 to +5).

<u>Source of Actuarial Staff</u>		<u>Last 12 Mos.</u> <u>Hirees</u> (Aggregate)	<u>Recent</u> <u>Trend</u> (Avg on a scale of -5 to +5)	<u>Future</u> <u>Trend</u>
Universities:	Act'l. Programs	<u>8</u>	<u>1.6</u>	<u>1.3</u>
	Nonact'l. Programs	<u>7</u>	<u>1.8</u>	<u>1.0</u>
	Agency Referrals	<u>0</u>	<u>2.0</u>	<u>2.5</u>
	Unsolicited	<u>0</u>	<u>0</u>	<u>0</u>
Internal Transfers from Nonact'l.		<u>1</u>	<u>1.7</u>	<u>0</u>
Others (please specify):		<u>10</u>	<u>3.3</u>	<u>-3</u>

- Newspaper advertisements
- Insurers and consultants
- Transfers from other government agencies' actuarial departments
- Other companies (2)
- AAA newsletter

Additional Comments:

- Need experienced staff, usually from other government departments.

2. What changes have you observed in the last 5 years in the educational background among your hires with respect to academic level and subject of major study? What changes would you like to see in the training and education of the university students?

<u>Background</u>	<u>Trend in Last</u> <u>5 Years</u>			<u>Desired Changes</u> <u>in the Future</u>		
	<u>Less</u>	<u>Same</u>	<u>More</u>	<u>Less</u>	<u>Same</u>	<u>More</u>
Mathematical Background	<u>0</u>	<u>8</u>	<u>2</u>	<u>0</u>	<u>6</u>	<u>4</u>
Actuarial Studies	<u>2</u>	<u>5</u>	<u>3</u>	<u>0</u>	<u>5</u>	<u>7</u>
Computer Facility	<u>0</u>	<u>2</u>	<u>8</u>	<u>0</u>	<u>4</u>	<u>9</u>
Business/Econ. Courses	<u>1</u>	<u>4</u>	<u>2</u>	<u>0</u>	<u>4</u>	<u>5</u>
Knowledge of Finance	<u>2</u>	<u>5</u>	<u>1</u>	<u>1</u>	<u>0</u>	<u>8</u>
Liberal Arts	<u>1</u>	<u>3</u>	<u>1</u>	<u>0</u>	<u>6</u>	<u>0</u>
Diversified Background	<u>0</u>	<u>3</u>	<u>2</u>	<u>0</u>	<u>3</u>	<u>3</u>
Master's Degrees	<u>1</u>	<u>2</u>	<u>1</u>	<u>1</u>	<u>4</u>	<u>0</u>
Ph.D.'s	<u>1</u>	<u>3</u>	<u>0</u>	<u>2</u>	<u>4</u>	<u>0</u>
Communication Skills	<u>2</u>	<u>3</u>	<u>2</u>	<u>0</u>	<u>2</u>	<u>7</u>

# MARKET FOR ACTUARIES

## APPENDIX A

(Continued)

**Additional Comments:**

- We do not recruit Masters and Ph.D.'s.
- Great if hirees know Interest Theory and Life contingencies, but may not be able to afford them.
- Computer ability is essential, e.g, Fortran on mainframe and Lotus.

Standards for Selecting New Staff

1. What range of actuarial exams do you look for in a potential actuarial staff member?

Minimum number of exams    3 (Avg)                      or credits    120 (Avg)  
 Maximum (if any)                      10 (Avg)

2. What other standards do you set when evaluating potential staff? Please rate (but not necessarily rank) on a scale of 1 to 10 the relative significance of the following factors. Also on a scale of 1 to 10, please rate the extent to which your recruits meet your standards. Please rate 1 being the lowest, 10 being the highest.

	<u>Entry</u> <u>Level</u>	<u>Meeting</u> <u>Expect.</u>	<u>Senior</u> <u>Hiree</u>	<u>Meeting</u> <u>Expect.</u>
(Average on a scale of 1 to 10)				
Scholastic Achievement	6.8	7.8	4.0	6.8
Native Intelligence	6.4	7.3	6.2	7.3
Technical Proficiency	4.9	7.9	8.6	8.7
Exam Potential	6.9	6.5	5.4	8.0
Work Experience	3.5	6.8	8.1	8.1
Integrity	8.5	7.8	8.9	9.0
Maturity & Personality	7.5	6.9	8.1	8.4
Communication Skills	7.3	6.4	8.2	7.9
Management Traits	2.9	5.6	7.0	8.2
Problem Solving Ability	7.3	7.3	8.6	8.0
Others (Please Specify):	9.5	4.0	9.0	3.5

- Hard worker (from former supervisor)
- Pleasant personality
- Government experience

3. Which of the following 3 statements best describes your success in meeting your hiring standards?

# of Occurrences

- |   |          |
|---|----------|
| a. Standards generally met                    | <u>4</u> |
| b. Compromises accepted but only occasionally | <u>6</u> |
| c. Lower standards often accepted             | <u>3</u> |

OPEN FORUM

APPENDIX A

(Continued)

4. Please indicate reasons for accepting lower standards, if applicable. Check as many items as appropriate.

	# of Occurrences
Insufficient candidates	<u>7</u>
Salary restriction	<u>8</u>
Competition from	
Other firms	<u>7</u>
Nonactuarial fields such as _____	<u>0</u>
Other locations such as _____	<u>3</u>
Strengths compensating for weaknesses	<u>5</u>
Hope of developing talents through training	<u>6</u>
Others (please specify):	<u>1</u>

- Government experience
- Civil service requirements, red tape, and timing.

Additional Comments:

- U.S. Government has pay restrictions.
- As a government office in the Northeast, we find it hard to draw people.
- Aversion some have for government work.
- We look for staff who will stay 3 to 5 years, not just 1 or 2.
- Students unaware of government opportunities and not encouraged to pursue them.

5. Are the numbers of suitable recruits adequate? Yes 4 No 8

If not, to what extent do they fall short? Please check as many areas of shortage as appropriate:

	# of Occurrences
Particular exam range	<u>5</u>
Specific experience	<u>6</u>
Candidates of the highest caliber	<u>4</u>
Communication skills	<u>6</u>
Management skills	<u>1</u>
Exam potential	<u>4</u>
Other (please specify):	<u>3</u>

- Adaptability to deal with non-textbook situations.
- Very few interested, poor credentials and lacking computer skills.

Additional comments:

- Far too many candidates have memorized 'cookbook' procedures but are unable to recognize invalid results or need to vary method.

MARKET FOR ACTUARIES

APPENDIX A

(Continued)

6. How have the quality and quantity of recruits changed in the last 5 years?

# of Occurrences

	<u>Quality</u>	<u>Quantity</u>
Improved	1	5
No change	9	3
Declined	1	3

7. What effect, if any, do you expect the current changes to the exam system to have?

# of  
Occurrences

- 1 Discourage talented students from pursuing an actuarial career.
- 4 Encourage talented students in pursuing an actuarial career.
- 2 Better prepare actuaries for jobs in your organization.
- 2 More poorly prepare actuaries for jobs in your organization.
- 4 Lengthen time until actuarial students become productive.
- 1 Decrease time until actuarial students become productive.
- 5 Other (please specify):

- Present improvement in pension syllabus is good.
- No effect (2)

8. What proportion of your new actuarial students do you expect will eventually qualify as Fellows?

Within your organization \_\_\_\_\_  
Elsewhere \_\_\_\_\_

This question has not been summarized on account of inconsistent interpretation among respondents.

OPEN FORUM

APPENDIX A

(Continued)

1989 Survey of Employers of Actuaries  
Aggregate Results Among 22 Universities and Colleges Completing the Survey

TABLE A

<u>Type of Work</u>	FELLOWS		ASSOCIATES	
	<u>Employed</u> <u>6/1/89</u>	<u>Required</u> <u>1/1/94</u>	<u>Employed</u> <u>6/1/89</u>	<u>Required</u> <u>1/1/94</u>
1. Full-time teaching	9.2	18.5	18.9	13.2
2. Part-time teaching	4.5	5.0	3.9	2.4
3. Actuarial research	.9	4.7	2.8	2.3
4. Other:				
Administration	2.3	1.3	1.0	1.0
Regular (nonactuarial?) teaching and research	.6	0	0	0
	<hr/>	<hr/>	<hr/>	<hr/>
	17.5	29.5	26.6	18.9

# MARKET FOR ACTUARIES

## APPENDIX A

(Continued)

### 1989 Survey of Employers of Actuaries

#### Aggregate Results Among 22 Universities and Colleges Completing the Survey

1. Why do you maintain an actuarial program? (Please check one.)

Student demand	<u>8</u>
Long-standing program	<u>10</u>
Other (Please specify):	<u>5</u>

- Faculty member available.
- Contributes to university image and reputation.
- Personal interest of one A.S.A.
- Program still in the experimental stage.
- We do not have a program yet.

2. Has the enrollment in your actuarial program increased or declined in the last 5 years? (please check one.)

Increased more than 25%	<u>16</u>
Increased 10% - 25%	<u>1</u>
Increased less than 10%	<u>1</u>
Decreased less than 10%	<u>1</u>
Decreased 10% - 25%	<u>0</u>
Decreased more than 25%	<u>0</u>

3. Please rate the quality of the students entering your actuarial program compared to other students at your institution:

	<u>Better than other Students</u>	<u>Same as other Students</u>	<u>Poorer than other Students</u>
Mathematical ability	15	5	0
Communication skills	5	14	1
Career-mindedness	19	1	0
Computer technical skills	6	13	0
Well rounded	7	11	1

4. Do you anticipate an increased enrollment in your actuarial program in the next 5 years? (please check one.)

Yes - more than 25%	<u>3</u>
Yes - 10% to 25%	<u>12</u>
Yes - less than 10%	<u>3</u>
No	<u>4</u>

5. How many professors of actuarial courses do you have?

<u>Status</u>	<u>Members of S.O.A.</u>	<u>Non-members of S.O.A.</u>
Full-time	34	12
Part-time	9	14

OPEN FORUM

APPENDIX A

(Continued)

6. Do you anticipate a need for more actuarial professors in the next 5 years? (Please check one.)

Yes, more full-time professors	<u>14</u>
Yes, more part-time professors	<u>0</u>
No	<u>8</u>

7. If you need more professors, from what source do you expect to get them?

Private industry	<u>3</u>
Other educational institutions	<u>9</u>
Other (please specify):	<u>7</u>

- New young Ph.D.'s with some actuarial qualifications.
- Get our students through Graduate School in Actuarial Science.
- All sources, both North American and international. As a university, we must look for persons with Ph.D.'s.
- We are not particular where they come from. One recent hire was from private industry. We hope to be graduating Ph.D.'s in Actuarial Science in the next 5 years.
- Mostly by financing Ph.D. studies with our best undergraduate students writing S.O.A. exams.
- Best chance: a new Ph.D., perhaps joint appointment with the Statistics Department.
- Wherever we can find them; must have Ph.D. and F.S.A. or A.S.A.

8. We would appreciate any comments or suggestions you might have as to how the Society of Actuaries could better support your needs.

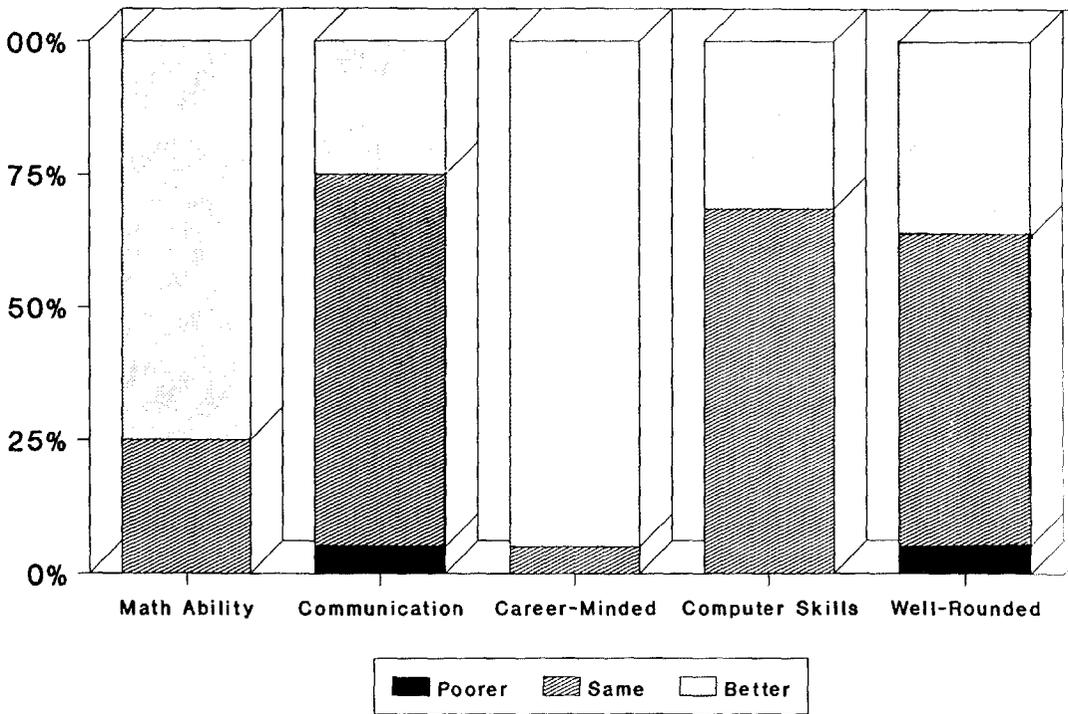
- Keep in touch with chairman of mathematics department; attract to institutions students who might become interested; provide pertinent materials to chairman or his designate.
- Recognize that for long term success in an academic environment an actuary needs (1) a Ph.D. and (2) to do research so that full acceptance by colleagues is granted. Acceptance may be higher in a business school environment than in a mathematics department.
- Our students, after passing 100 and 110, have found excellent jobs and continue to pass more exams. It is very easy to place these students in insurance companies. These students are near the top among our math. majors, highly motivated as well as talented.
- Perhaps to organize a newsletter publishing job opportunities.
- Make students aware of the actuarial career.
- Students and staff members of Actuarial Science need interaction with the profession in the summer. Could the Society provide a clearing-house service for companies willing to hire students and staff members as summer employees?
- Provide text desk copy support similar to other publishers.
- Information on exams and career possibilities to pass on to students.
- Need actuarial publications, e.g., Records of the American Institute of Actuaries, Proceedings of the Casualty Society, and Journal of the Institute of Actuaries.

MARKET FOR ACTUARIES

APPENDIX A

(Continued)

## Universities and Colleges Actuarial Students vs Other Students





MARKET FOR ACTUARIES

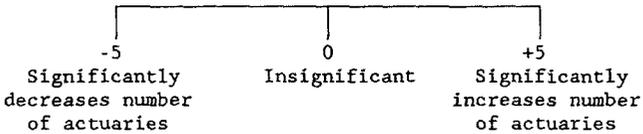
APPENDIX A

(Continued)

1989 Survey of Nontraditional Employers of Actuaries  
Average Results Among 7 Investment Firms and Investment Departments

Changes in the Role of Actuaries

For each of the categories shown below, please indicate how the following factors have influenced or will influence the role of actuaries. Please rate on a scale of -5 to +5 as follows:



<u>Factor</u>	<u>Last 5 years</u> (Average Among Responses)	<u>Next 5 years</u>
Changes in employee benefits consulting	.7	.6
Computer technology	.6	.9
Amount of research performed	.1	.7
Government regulations	2.3	2.6
Marketing of insurance products	.9	.6
Changes in economy	1.6	1.4
Emphasis in asset management	1.9	2.9
Changes in investment products	.8	2.2
Growth in interest-sensitive products	2.4	1.4
Expert witness testimony	.8	1.2
Teaching trends	-.3	-.8
Mortality/morbidity trends (e.g., AIDS)	.8	1.0
Quantity and quality of MBAs	-.8	1.7
Decentralization of insurance companies	.2	0
Merger & acquisition trends	.5	.5

OPEN FORUM

APPENDIX A

(Continued)

1989 Survey of Nontraditional Employers of Actuaries  
Aggregate Results Among 7 Investment Firms and Investment Departments

1. Please describe briefly the service performed by your department or your organization.

- Investment banking/institutional brokerage
- Financial/insurance consulting
- Pension, benefits, asset & compensation consultants
- Advise insurance companies as asset/liability managers
- Asset/liability management consulting; investment strategies consulting

2. Are you an actuary? Yes 5 No 2

If so, please describe how, if at all, your actuarial training has helped you in your work.

- Knowledge, experience as an actuary in consulting
- Essential

If you are not an actuary, how acquainted are you with actuarial resources in order that you might utilize them?

- Very acquainted, being an insurance and finance professor
- Fairly well acquainted

3. Do you have any actuaries or actuarial students under your employment now? Yes 6 No 1

If so, in what capacities?

- As people who understand the insurance/pension business
- Research and modeling
- As consultants

Have you considered hiring any in the last 5 years? Yes 6 No 1

If so, in what capacities?

- As consultants
- Research and computer modeling

MARKET FOR ACTUARIES

APPENDIX A

(Continued)

4. Have actuaries generally met your expectations? Yes 4 No 2

If not, in what ways have they fallen short and what advice would you offer to an actuarial prospect for your organization? what advice would you offer to the Society of Actuaries in making future actuaries more suitable to your organization?

- Don't lower standards by providing college class and seminars as exam replacement.
- Learn modern financial techniques for valuing assets and liabilities - at market values.

5. Would you consider hiring an actuary in the future? Yes 6 No 1

Why or why not?

- Yes, to provide insight into insurers' problems and needs.
- Yes, for good basic mathematics skills
- No, currently inconsistent with the mission of the company

6. On a scale of 1 to 10, 1 being the lowest, 10 the highest, please indicate the extent to which the following statements describe how an actuary may fit your needs. Please feel free to modify the statements or elaborate upon them.

Avg Among  
Responses

5.3 We have essentially financial analytic positions for which an actuary is one of several professionals who may qualify.

5.2 We have very quantitative financial positions for which a 'rocket scientist,' a mathematics Ph.D., a statistician, or an M.B.A. is better qualified than an actuary.

5.0 We have positions for actuaries exclusively, not for their investment expertise but for their knowledge of insurance and pension. This is so because our clients consist of insurance companies and pension plans.

8.0 We need a special kind of actuary, one who is conversant with both the asset and liability sides of the balance sheet.

6.3 We have a need for an actuary's skills, but find most actuaries lack either communication skills, business acumen, or a diverse enough background

None of the above (please specify).

OPEN FORUM

APPENDIX A

(Continued)

7. Please comment on the relative strengths and weaknesses of all or some of the following professionals from the standpoint of their respective apprenticeships and the quality of the individuals.

<u>Category</u>	<u>Respondents' Comments on Strengths/Weaknesses</u>
Actuary	Knowledge of financial security programs Helpful Very necessary Direct training With a Ph.D. or equivalent only
Math. Ph.D.	Generally too abstract Marginal Unnecessary Irrelevant Maybe acceptable
Ph.D. in Applied Math., Stat., etc.	Useful for most technical positions Very helpful Possibly, but not likely; need more pragmatism Irrelevant Secondary to Ph.D. in economics
Econ. Ph.D.	Vastly overrated Somewhat helpful Possibly, but not likely; need more pragmatism Irrelevant Prime qualifications
M.B.A.	Not useful unless technically or sales oriented Somewhat helpful Yes Direct training
C.F.A.	Knowledge of investments/finance Marginal Definitely Direct training
C.L.U.	Irrelevant Marginal Yes, need more Irrelevant
C.P.A.	Knowledge of accounting Marginal to helpful Yes, need fewer Irrelevant
Other Former Academicians	Creative, research-oriented people Finance and management-science professors Yes, in sales roles Irrelevant

MARKET FOR ACTUARIES

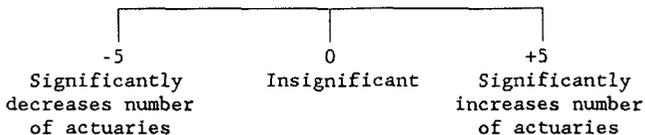
APPENDIX A

(Continued)

1989 Survey of Nontraditional Employers of Actuaries  
Average Among 39 Software Firms, Management Consultants and Other Employers

Changes in the Number of Actuaries

For each of the categories shown below, please indicate whether this has been or will be a significant or insignificant factor influencing the demand for actuaries. Please rate on a scale of -5 to +5 as follows:



<u>Factor</u>	<u>Last 5 years</u>	<u>Next 5 years</u>
	(Average Among Responses)	
Changes in legislation	2.9	3.0
Changes in government reporting requirements	2.0	2.1
Type of insurance products sold	2.2	1.7
Changes in retirement plans	1.9	1.6
Changes in employee benefits	1.4	1.6
Corporate reorganization	.3	.2
Changes in the role of the actuary within the company	.4	.5
Availability of actuarial computer software	.3	0
Changes in methods used to market products	.4	.5
Changes in investment products	1.2	1.2
Effect of economy on insurance products	.9	1.0
Mortality/morbidity trends	1.0	1.3
Quantity and quality of MBAs	-.3	0
Decentralization of insurance companies	.4	.5
Merger & acquisition trends	-.2	.2

OPEN FORUM

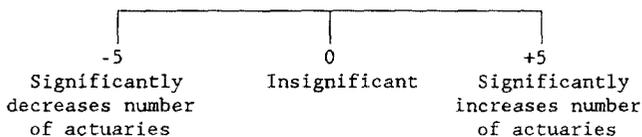
APPENDIX A

(Continued)

1989 Survey of Nontraditional Employers of Actuaries  
Average Among 39 Software Firms, Management Consultants and Other Employers

Changes in the Role of Actuaries

For each of the categories shown below, please indicate how the following factors have influenced or will influence the role of actuaries. Please rate on a scale of -5 to +5 as follows:



<u>Factor</u>	<u>Last 5 years</u> (Average Among Responses)	<u>Next 5 years</u> (Average Among Responses)
Changes in employee benefits consulting	1.9	1.8
Computer technology	1.3	1.2
Amount of research performed	1.4	1.4
Government regulations	1.9	2.2
Marketing of insurance products	.8	.9
Changes in economy	.7	1.1
Emphasis in asset management	1.5	1.9
Changes in investment products	1.5	1.4
Growth in interest-sensitive products	1.9	1.5
Expert witness testimony	.8	1.4
Teaching trends	.2	.3
Mortality/morbidity trends (e.g., AIDS)	.8	1.1
Quantity and quality of MBAs	-.4	-.2
Decentralization of insurance companies	.5	.5
Merger & acquisition trends	.4	.6

MARKET FOR ACTUARIES

APPENDIX A

(Continued)

1989 Survey of Nontraditional Employers of Actuaries  
Aggregate Among 39 Software Firms, Management Consultants and Other Employers

1. Please describe briefly the service performed by your department or your organization.

- Actuarial consulting - including pensions, employee benefits, and management consulting (6)
- Writing and marketing actuarial software (5)
- Actuarial consulting and software development (3)
- Executive search (3)
  
- Financial and business services (2)
- Preparing and selling investment research
- Annual valuations of pension and profit sharing plans
- Insurance product development
- Underwriting group insurance
- Direct-response marketing and life & health products
  
- Employee benefit negotiations for union with various employers
- Workmen's compensation fund, life insurance company, commercial
- Government relations representative for insurance industry
- Lobbying, research, and education
- Lab testing for insurance industry
- Futurist speaker
  
- Holding company of insurance, finance, manufacturing, etc.
- Provide technical services to subsidiaries
- Manufacture of control systems
- Communication services
- Pulp and paper, wood products

2. Are you an actuary? Yes 32 No 6

If so, please describe how, if at all, your actuarial training has helped you in your work.

- Essential requirement (12)
- Understanding of insurance business (4)
- Verification of reserves and pricing models
- Having worked with company and consulting actuaries
- Actuarial principles implemented in software
- Broad background in business and personal contingencies
- Cost pension improvements and explain employee benefits
- Knowing the industry in which I recruit
- Actuarial underwriting
- Target market identification, projections, financial management
- Little, other than developing thought process

If you are not an actuary, how acquainted are you with actuarial resources in order that you might utilize them?

- Very
- Through clients and own use of consulting actuaries

OPEN FORUM

APPENDIX A

(Continued)

3. Do you have any actuaries or actuarial students under your employment now? Yes 19 No 19

a. If so, in what capacities?

- Product development, management consulting, data processing and software (5)
- Consulting and/or financial studies (2)
- Assistants (2)
- Represent industry in dealing with government on actuarial issues
- Analyze implications of state and federal proposals
- Comptroller
- Salespeople
- Recruiter
- Manager of Actuarial Services
- Programming

b. Have you considered hiring any in the last 5 years? Yes 20 No 12

If so, in what capacities?

- Programming, research and development
- More consultants in valuation and cost analysis
- Assistants (3)
- Research and analysis
- Salespeople
- Employee benefits consulting

4. Have actuaries generally met your expectations? Yes 17 No 3

If not, in what ways have they not met your expectations?

- Tend to go off tangents instead of focusing on job at hand
- Management skills on the low side
- Poor communication and/or organizational skills
- Not independent enough
- Lacking legal knowledge

## MARKET FOR ACTUARIES

### APPENDIX A

(Continued)

a. **What advice would you offer to an actuarial prospect for your organization?**

- Communication skills (5)
- Broad perspective and practical knowledge of insurance (2)
- Knowing industry and marketing techniques (2)
- Systems knowledge, product development and analytic skills (2)
- Learn more about investments
- All the mathematics courses you can take in college
- Passing exams and attaining Fellowship (2)
  
- Commitment to meet deadlines
- Motivation and desire more important than qualifications
- Develop management skills and a broader scope.
- Interpersonal skills
  
- Pursue another field (e.g., an M.B.A. or a C.F.A. instead).

b. **What advice would you offer to the Society of Actuaries in making actuaries more suitable to your organization in the future?**

- Interpersonal/communication skills besides technical skills (6)
- More business and marketing emphasis (3)
- More emphasis on finance, economics, and management in exams (2)
- More emphasis on the practical aspects of insurance - expenses, technology, etc.
- Loss development and profit analysis
- Training in project management (managing multiple projects from beginning to end)
- More emphasis of computer science
- Broaden exposure to company structures, finance, and the business of insurance.
- More legal emphasis
- Developing a broader perspective
- Create need for nontraditional jobs for actuaries
- Consider nontraditional roles, reduce exam emphasis, teach business case studies.
- New exam system weeds out as many good candidates as poor ones.
- Granting credit for C.F.A. exams.

OPEN FORUM

APPENDIX A

(Continued)

5. Would you consider hiring an actuary in the future? Yes 34 No 1

Why or why not?

- Yes, for expansion and for additional help (8).
- Yes, for replacement only.
- Yes, if I could afford well-rounded person with systems skills.
- Yes, in marketing software and technical analysis for clients.
- Yes, but only as consultant.
- Yes, for basic knowledge of insurance business.
- Yes, in employee benefits area.
  
- No, sporadic need; better met by consulting actuaries.

6. On a scale of 1 to 10, 1 being the lowest, 10 the highest, please indicate the extent to which the following statements describe how an actuary may fit your needs. Please feel free to modify the statements or elaborate upon them.

Avg Among  
Responses

5.0 We have essentially financial analytic positions for which an actuary is one of several professionals who may qualify.

4.1 We have very quantitative financial positions for which a 'rocket scientist', a math. Ph.D., a statistician, or an MBA is better qualified than an actuary.

3.5 We have positions in need of actuaries exclusively, not for their investment expertise but for their knowledge of insurance and pension liabilities, because our clients consist of insurance companies and pension plans.

4.7 We need a special kind of actuary, one who is conversant with both the asset and liability sides of the balance sheet.

4.6 We have a need for an actuary's skills, but find most actuaries lack either communication skills, business acumen, or a diverse enough background

None of the above (please specify).

# MARKET FOR ACTUARIES

## APPENDIX A

(Continued)

7. Please comment on the relative strengths and weaknesses of all or some of the following professionals from the standpoint of their respective apprenticeships and the quality of the individuals.

<u>Category</u>	<u>Respondents' Comments on Strengths/Weaknesses</u>
Actuary	Very important (6) Valuable for insurance knowledge (3) Very specialized (4) Generally sound (2) Part-time need Too theoretical and lacking communication skills Need business and analytic skills
Math. Ph.D.	Math. aptitude 'A Plus' As alternative to actuary Need business background Not applicable (4) Not practical (3)
Ph.D. in Applied Math., Stat., etc.	Valuable (5) Good mathematical aptitude (2) As alternative to actuary No need for theoretical research Not important (7)
Ph.D. in Computers or Systems	Valuable (6) Broad knowledge Logical thought process Not applicable (6)
M.B.A.	Valuable (5) General management Need analytic skills & insurance knowledge Not applicable (6)
C.F.A.	Good business knowledge (3) Good for development of new software product Applicable (2) Not applicable (6)
C.L.U.	Good insurance knowledge (3) Useful for policy and general accounting With relevant practical experience Not applicable (8)
C.P.A.	Valuable (3) Knowledge of taxes and statements Practical; good financial understanding Applicable as controller Useful for 'looking at companies' books' Not applicable (6)

