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## WORKING TOGETHER

By Joan Barrett and Thomas N. Herzog

Joan: The question arises as to how actuaries working in industry or government should develop collaborative relationships with faculty members of universities. Tom, could you describe some of your collaborative efforts with faculty members of universities?

Tom: I have collaborated on at least six projects with "full time" academics as follows:

- My first project was a theoretical mathematics paper I wrote with my thesis advisor at the University of Maryland. So, in a sense, this should not even count.
- My next project was a chapter in a book with Donald B. Rubin. This was the first paper on the application of multiple imputation. This paper may have technically been completed before Don entered academia but Don spent a large number of years as the Chairman of the Statistics Department at Harvard University. On this project, I wrote code implementing Don's ideas and then we each wrote different parts of the chapter.
- I then collaborated with Mike Clauretie of University of Nevada Las Vegas (UNLV) on two papers having to do with the effect of State foreclosure laws on the time between default and foreclosure. This was primarily a case in which I provided the data and Mike took it from there.
- I then wrote a book on *Applications of Monte Carlo Methods to Finance and Insurance* with Graham Lord of Princeton University. Here, we merged a short elementary piece of mine with extensive class notes of Graham. I rewrote his notes to get the bulk of the book into a single writing style.
- I then collaborated with Gil Fellingham and Dennis Tolley of Brigham Young University (BYU) on a paper on an application of credibility

methods to health insurance. My main contribution here was the discussion on the history of credibility theory and its application.

- Finally, I worked with Robin Cunningham and Richard London on a text on *Methods for Quantifying Risk*. Here, each of us was responsible for a different part of the book and then generously critiqued the work of the others.

Joan: Why do you think you were able to work so well with such a wide range of academics?

Tom: I think there were two main reasons. First, I have a Ph.D. which is a research degree. Second, I have taught a number of statistics and actuarial science courses over the years, essentially as an adjunct professor. The general thread that I pick from this is that in addition to my research degree at least three of my collaborators had substantial experience working in industry. Don Rubin spent a number of years with the Educational Testing Service; Graham worked for Metropolitan Life and Morgan Stanley; and Dennis worked for Battelle. Moreover, Mike Claretie was a member of the finance department of a business school and so it is not surprising that he should have a practical bent as well.

Joan: How did you meet your collaborators? How could someone without your connections go about that?

Tom: You need to get out of your cubicle. Go to national/international conferences or local seminars at universities or local clubs. The Actuarial Research Conference (ARC) is a great place to meet academics. Also, in Washington for example, there is the Washington Statistical Society which sponsors a number of technical statistical talks each month—all at no cost. Check with national organizations to find local chapters. Another organization is The Institute for Operations Research and the Management Sciences (INFORMS). The executive director is Mark Doherty formerly SOA research director.

Joan: How did you come up with ideas?

Tom: Let your mind wander. Ask yourself: If you do not do something that needs to be done, who will do it? I was reading several papers about credibility on the CAS syllabus when I worked for the Florida Insurance Department. Each paper had different notation and a lot of overlap. I thought that it would be much easier for the student if someone wrote a single paper combining the ideas of all of these other papers into one paper with a single set of notation. So I did it.

Joan: Where does the funding come from?

Tom: When I worked for the Social Security Administration (SSA), my Branch Chief, Fritz Scheuren, got SSA to hire Don Rubin as a consultant. In

other cases, no money changed hands between my employer and my collaborators. My employers have been good about funding university courses.

Joan: Were your results more towards practice, education or research? If so, how was it received by others? How were your results disseminated?

Tom: Some of each. Books were for education. The work with Rubin on multiple imputation was applied research and has had major impact on statistical community. Interestingly, one reviewer of our DQ text criticized it for only having three or four references on multiple imputation. The Clauretje and Fellingham/Tolley papers were very applied. The Fellingham/Tolley work (published in the NAAJ) was very technically sophisticated and carried out at BYU. Mike Clauretje was able to get two papers published in finance/economics journals.

Joan: Are there other ways in which businesses can promote a good relationship with a local university?

Tom: Hire their undergraduate students for full time positions.

Send both junior and senior staff to take courses at the university. Practitioners need money to pay for university courses and to hire academics to do consulting work at their company for short periods of time—e.g., (1) one day per week, (2) for a few weeks over the summer, or (3) even during sabbaticals.

Practitioners need to think "big tent" and to get outside their comfort zones.

Practitioners need to take the initiative. They need to try to find people they can effectively communicate with. The problem is that sometimes practitioners go to universities to give talks and the reaction from the faculty is that "these people just do not get it."

Joan: Tom, thanks so much for your time. You have certainly provided valuable insights into a subject that we need to promote within the profession.