Forum

Another View of the Current Tough Job Market

Daoqi Yang

When reading newspapers or newsletters of academic associations, we are overwhelmed by the views of the negative side of the current tough job market. People even say that this difficult employment situation will not change significantly in the near future. This has made many feel hopeless and pessimistic. Is there a good side to this? In this article we try to explore the positive effects of the bleak job market.

At the SIAM Annual Meeting in San Diego in July 1994, I found out that many graduate students gave talks there. After coming back to my university, I went to the library to read the latest journals in order not to miss out on any new important papers in my field. I saw in those journals many names of the graduate students I had just met at the conference. This made me think of the reasons why so many graduate students nowadays publish their research before graduation and why they are now more involved than ever before in academic activities like attending conferences.

After reflecting for a couple of months, I finally came to attribute this effect to the job market. Contrary to the views of newspapers and newsletters, the current tough job market has also had positive effects. Some of these effects are the following:

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1) An increasing number of graduate students publish their research papers before graduation. This implies that their research is of fairly good quality. Furthermore, more students now publish papers in the best research journals in their fields. In contrast to some years ago, when one's Ph.D. thesis was usually one's first research paper, graduate students nowadays are becoming more involved in research than in the past. In this way, they are learning early on to become more efficient and effective researchers.

2) Graduate students are now more than ever aware of the importance of academic associations. This observation comes from the fact that more students now attend academic conferences and give talks on their own research. By attending conferences, students get to know people in their field and exchange ideas, which potentially may lead to job opportunities and better future research. These students are usually sponsored by their academic advisors, who have also realized the shortage of employment opportunities and have intentionally prepared their students for the future challenge of job hunting.

3) The current job market has also changed students' and researchers' views about theoretical research and industrial applications. Theoretical research is essential to industrial applications. The ultimate goal of theoretical research lies in industrial applications, which improve the quality of life for the whole nation, whose funds are invested in the educational system. Over the years, there have not been enough elite theoreticians going into industry. Today's employment situation forces many Ph.D. students in theoretical fields to take application-oriented courses and to seek jobs in industry as their first choice; this will undoubtedly result in future developments in industry and cause a further demand for theoretical researchers. On the other hand, many theoretical researchers try to apply their research to solve problems in industry in order to get research grants, which would also potentially expedite the development of industry. For example, some theoretical researchers in partial differential equations have recently

picked up research projects in superconductors and semiconductors.

4) College students are getting more out of their education than a few years ago. In order to get a job after graduation, students must work harder and perform better in class. With the bleak job market and increasing expense of going to college, students cannot afford not to have a good GPA. There are some older students in my class who came back to school after working for some years. They tend to work hard and perform well, which has also inspired younger students to try their best. Believe it or not, I enjoy teaching more in such a learning environment.

5) The quality of teaching and research has been improving more in recent years than in the past. With the increasing amount of competition for positions at colleges and universities, professors now more than ever care about their teaching and research. For many institutions, if there is one faculty position, they usually recruit more than one candidate and choose the one who has done the best job. Therefore, professors cannot afford not to have a strong record of quality teaching and research. This will eventually result in more qualified college graduates and will boost the economy.

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These are some positive effects of the difficult job situation, and they are fairly easy to observe. However, there are some other subtle aspects that people might not have noticed. I happen to know some Ph.D. students in mathematics who, at the time of graduation, did not get even a single interview from the dozens of universities to which they applied. They felt as though they had been swindled; despite all the years of hard work and the excellence of their research, they simply could not get a job in the end. Then they switched careers a bit and took courses in computer science, electrical engineering, industrial engineering, etc. Some of them, staying in school approximately two extra years, even got master's degrees in one of these fields. They finally got nice jobs in good companies with salaries comparable to that of an associate professor's. Had they first gotten a job as a postdoc or an assistant professor, it would have taken them at least five years working in their original fields to get such salaries. In fact, they have benefited from this bleak job market, although at the beginning they thought that they were victims of it. Among these people, one is now working in a computer company designing compilers for programming languages. He now is able to write technical reports and research papers in his new area after only two years on this job. He maintains that his education in mathematics has helped him greatly in his current job. It is worth mentioning his remark that if he had not gone into industry, he would never have known that the abstract algebra he studied in college has important applications in designing error detection and correction codes, which is a vital part of telecommunications and computer networks. I also know a graduate student in computer science who had wanted to be a theoretical computer scientist with a clear goal of conquering challenging problems in NP-completeness. Facing the tough competition for faculty positions at universities, she changed her research area into object-oriented database systems. After finding a job in a company, she said that had it not been for the tough job market, she would never have thought of changing to the area which is best suited to her.

The current situation should also send a message to theoretical departments of universities around the country that it is incumbent upon them to make all their potential graduates aware of the realities of the job market and to encourage their graduate students to prepare for a broad range of jobs. On the other hand, graduate students should assume responsibility for finding out what opportunities are available to them and prepare themselves for jobs in either academia or industry.

Although I have stressed some of the positive aspects of the current job market, please do not misinterpret me as a person who wanted this tough situation to occur. I personally sympathize with the people who have suffered from the weak economy and tough job market. Indeed, this situation has caused many hardships for most or all of us. The purpose of this article is to inform people of the positive effects of the job market and to help them have an optimistic view of it. This may make our lives a bit more enjoyable.

Response

Curtis D. Bennett and Stephen Kennedy

We agree with Professor Yang that there are subtle effects of the difficult employment market which go largely unrecognized. In our opinion, however, many of them threaten the well-being of our profession. While these effects are difficult to measure, we believe that the job crunch has disillusioned a number of junior mathematicians, has forced members of two-career families to leave mathematics, has damaged the teaching and research of many, and may damage the public perception of our field. We feel these

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consequences must be considered when discussing the employment crisis.

The job crisis has driven people from the profession. It has caused an enormous loss of human potential in mathematics and has damaged the lives of many. Moreover, many junior mathematicians have become disillusioned. Even some of those still in the profession feel mistreated by the establishment. There exists the perception that the AMS is uncaring at best and exploitative at worst. While we feel these views are unjustified, it is clear that the job crisis has caused these views to spread, and this is a matter of concern for the entire community. The last thing we want is to turn future mathematicians into disillusioned bitter people.

Recent employment surveys have shown an increasing number of Ph.D.s starting their careers in one-year positions. A compilation of applicants at one Big 10 university revealed that fewer than 40 percent of applicants were expecting their Ph.D. this summer. Anecdotal evidence also suggests that many people are going through a succession of one- and two-year positions before either landing a tenure-track job or leaving the profession. To land a job at a strong research school today frequently requires a minimum of two multiyear postdocs. While this also happened in the 1970s, mathematicians today are more likely to belong to two-career families. As a result, many young mathematicians cannot easily relocate multiple times. Thus, the current job market is inhibiting the ability of mathematicians in two-career families to obtain jobs, particularly at research institutions. We believe that this effect falls disproportionately upon women mathematicians.

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Searching for a job in today's market requires an enormous amount of energy and time. Instructors and researchers concerned about finding jobs cannot be at their best. The balancing act between research and teaching gets tougher when you need one more paper to get a job. Job seekers may rush their papers to publication rather than take the time to make sure their papers are of good quality. The physical and psychic dysfunction caused by moving interfere with research activity. We find it likely that the market has actually hurt the quality of teaching and research by junior faculty.

A final concern for the community is the public perception of mathematics. Funding for mathematics is already endangered. We must expect to be forced to justify our existence. In the current political climate of deep faith in market-driven solutions to problems, what reaction can we expect from policymakers to the fact that 1 in 7 new mathematics Ph.D.s is unemployed [*Notices*, Nov./Dec. 1994, p. 1124]? In addition, some of those forced out of the profession leave wishing they had never entered a Ph.D. program. These people will go on to positions in industry and government and from there will make decisions about the value of academic mathematics that will affect our future.

What should be done about the employment crisis? The first step must be to gather better data about the employment situation. With the prevalence of temporary positions, most people on the market are not new Ph.D.s. No one knows who these people are and at what rate they are being forced out of the profession. No one knows what the long-term prospects are for a new Ph.D. The annual survey currently gives us full information only about new Ph.D.s. The AMS and YMN are trying to get more information. We must continue these efforts and make sure they are successful. Of course, we also need to do a better job of finding out about nonacademic alternatives for mathematics Ph.D.s. The AMS, MAA, and SIAM have begun the process of educating more mathematicians about nonacademic employment. These are positive measures, and as departments make an effort to train their students for more than just academic careers, the situation will improve.

We also feel departments must keep better track of their graduates. We believe most schools will find their graduates end up in a wider variety of positions than they might think. This information would help graduate students and faculty learn what jobs students might expect to find, allowing students to better prepare themselves for the job market. It would also improve the networking abilities of students. Past graduates are a wonderful source of information for the entire community, and we are doing ourselves a great disservice when we fail to keep contact with them. We should embrace all of our graduates as part of the mathematical community.

We feel that the community needs to carefully consider the damage the job crunch may have on the profession itself. A situation which damages the public perception of mathematics, makes it harder for individuals in two-career families to obtain permanent jobs, and disillusions the next generation of mathematicians will do long-term harm to mathematics.