Grants and Joint Research—the Foundations of My Own Research Career

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In the 1970s, I joined a national research institute as a researcher then in my mid-20s. Looking back, I feel that I was placed into an exceptionally favorable research environment. At that time, my institution possessed the world's fastest mainframe computer for research in the field of statistical science and engaged in undertakings in joint research that gave me exposure to numerous real-world challenges. Not only was it unnecessary for me to help my supervisors with their own research, but I also had research assistants who would handle programming tasks for me. In that setting, I had absolutely no need for acquiring any research funding, whatsoever. Budgeting to cover expenses for foreign travel was about the only problem I faced. Although my institution encouraged researchers to publish in leading foreign scientific journals and deliver research presentations at conferences of foreign scientific meetings, for young researchers like me, obtaining the funds to cover expenses for foreign travel was virtually impossible in those days. Although I wasn't against the idea of paying out of my own pocket, on most occasions I fortunately had financial assistance from someone within or outside the institution whenever I needed to travel abroad.

Largely for these reasons, it wasn't until some years after I had been with my institution that I finally heard about the Grants-in-Aid for Scientific Research (Kakenhi). On that occasion, I was participating in Grant-in-Aid for Special Project Research and had been given responsibility for the development of a software application for time series analysis. Although the intensive stage of work for this project lasted only around one year, my experience in handling the development of a software application that by world standards was on the cutting edge in terms of its models, computational methods, and assessment benchmarks would prove to be one of the biggest assets to my continuing research career. Software development demands many know-how that cannot be assimilated through the reading of research papers. When my project tasks were complete, I felt that I had mastered the subject of time-series analysis down to its finer nuances, and gained a newfound confidence that I had become a researcher with the credentials for world-class endeavor.

Perhaps my credentials may have been acknowledged in some way because afterward I was invited to the US to spend two years as an assistant professor and researcher. During that first year, I gave lectures on

standard probability theory and advanced time-series analysis at a university in the US Mid-South. In the second year, the connections I had made through my assistant professor position enabled me to pursue research of my own choosing at a national research institute located in Washington DC. During that period, I worked together with a researcher close to 20 years my senior and demonstrated accomplishments on a scale productive enough to surprise even me. In effect, I had entered the first peak in my professional career as a researcher.

When I returned home in 1982, the age of the personal computer had begun in Japan as well. By this time, even researchers in the field of statistical science faced a need for research funding, and it was around then that I received a fantastic PC with funding from Kakenhi that thankfully I could share with a senior colleague at my institution. Although that PC was something I had acquired with little effort, ultimately it would be the machine that I ended up working with longer than any other, and became my most useful research tool. I was able to use this PC like a workstation connected to a large number-crunching mainframe and graphically output the computational results to the PC's display, and my research efficiency accordingly improved by leaps and bounds. Of course, back in those days, our mainframes were about a million times slower than the supercomputer today, but at the time, they still provided us with one of the world's best computing environments for statistical science research. It was within that setting that I succeeded in developing a new methodology to extend Kalman filtering—a method of estimation already in use worldwide—to nonlinear, non-normal models.

Having opened the door to nonlinear modeling, my paper attracted so much attention that it even led to a special session of the American Statistical Association. Moreover, it was the one paper that meant the most to me. Unfortunately, however, it did not win as much acceptance as I had hoped for among members of the wider research community. Perhaps the reason was that it was too specialized in its content for a general audience. Statistical modeling requires that one compare a series of conceivable models. Methods that demand tedious programming work each and every time are difficult to deal with, no matter how nice the results they may deliver. Wasn't there a simpler way? The answer came to me in the midst of a completely unrelated undertaking in joint research, over five years after I had begun to entertain that question.

In the 1990s, I had reached my mid-40s and published papers including the one cited above on important findings in a variety of different fields, and feel that this period represented the second peak in my research career. It also happened to coincide exactly with the period that I relied most heavily on Kakenhi. At that time, limits on overlapping grants were not as stringent as they are today. Not only were three of my applications for Kakenhi approved, but I was also able to participate for six years in joint international scientific research with institutions in the US. It was also around this point in time that recipients of the Grants were first allowed to use grant funding to cover their expenses for overseas travel. Thankfully, that

ended my worries about the cost of traveling abroad in a professional capacity.

The decade of the 2000s ushered in an era of group-led research even for the field of statistical science. Additionally, the need to cultivate new talent compelled many researchers to seek competitive funding for large-scale projects. By that point, I had entered my 50s and had just been appointed to the position of director-general at my institute. Since then, no matter how much I have needed to raise research funding for my institution, my own research has never been on such a large scale that the expenses have surpassed the amount of Kakenhi. Consequently, I have concluded my statistical science research solely with basic funding from my institution and a Grant-in-Aid for Scientific Research. Of course, I cannot overlook the fact that in addition to Kakenhi, collaboration with researchers from a variety of fields in joint undertakings has allowed me to achieve the productive research career that I have enjoyed to date.

In the decade that began with 2010, I became involved in grant screening and administration affairs as chair of Sub-committee 1 for Screening & Evaluation and as head of the Committee on Grants-in-Aid for Scientific Research. With the perspectives that these positions on the grant decision-making side provided, I gained a renewed realization that Kakenhi from which I myself had benefited over many years was supported by and depended on peer reviews from numerous researchers. On becoming a member of the Committee on Grants-in-Aid for Scientific Research, I learned that the Research Center for Science Systems has spearheaded the annual reviews of the system for Kakenhi, made improvements to the application screening process as well as the system itself, and facilitated the system's ongoing evolution. I have nothing but gratitude and respect for such diligent effort.

For some time now, national universities in Japan have seen their operational expense subsidies trimmed repeatedly year after year, and are today on the verge of also having their core funding cut to the bone. By contrast, the orientation of competitive funding toward research that offers clear-cut or immediate rewards has grown stronger in the process. In this setting, Kakenhi has served an increasingly instrumental role as the last stronghold of support for scientific research from the bottom up by researchers with independent ideas.

I can only hope that the program of grants for scientific research will continue to thrive and expand in the years ahead.