Analysis of the National Science Fund for Distinguished Young Scholars of China in 2017

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***Abstract*—National Science Fund for Distinguished Young Scholars is one of the most important national research programs in China, supports young scholars who have made outstanding achievements in basic research to select their own research directions and conduct creative research. This paper uses annual statistical data from the National Natural Science Foundation of China to analyze the funding scale and approved programs distribution of this program in 2017. The result shows that, the overall approval rate of the project is 7.38%, and the amount of funding for each project in most disciplines is 3.5 million Yuan, only mathematics and management disciplines are 2.45 million Yuan per project. Among the approved projects, the proportion of engineering & materials disciplines is 19.58%, which accounts for the largest proportion; the proportion of management disciplines is 2.52%, which accounts for the smallest proportion. Beijing and Shanghai have the largest number of projects approved, accounting for 39.39% and 18.69% of the country. Some provinces have only received a small number of projects, and some have not. 73.74% of the approved projects belong to the universities, and 26.26% of the projects belong to the research institutions. The National Natural Science Foundation of China should encourage more scholars to apply for this program, increase the approval rate, and optimize the amount of funding.**

Keywords—National Science Fund for Distinguished Young Scholars; National Natural Science Foundation of China; program funding; approval rate; young scholar

I. Introduction

National Science Fund for Distinguished Young Scholars (NSFDYS) is one of the most important national science research programs in China, established by the National Natural Science Foundation of China (NSFC) in 1994. The purpose of this program is to supports young scholars who have made outstanding achievements in basic research to select their own research directions and conduct creative research, encourage overseas scholars to return to China and accelerate the training of a group of outstanding academic leaders who have entered the forefront of world science and technology. According to the National Natural Science Fund Guide to Programs, the applicant for the program must be citizenship of the People's Republic of China or distinguished young Chinese scholars without Chinese citizenship, younger than 45 years old, owned a senior professional position or PhD degree with good scientific integrity, have sufficient experience of conducting basic research projects or other basic research, no employment with foreign institutions and be able to work in home institution for no less than 9 months per years. A scholar can only get the project once in his life [1].

NSFDYS is the most difficult program to be approved by the National Natural Science Foundation of China. The amount of funding is very large and is only funded to a single scholar, not a team. The project winners are elites in the elite and the competition is extremely intense. Many scholars have studied the information of the National Science Fund for Distinguished Young Scholars, and published hundreds of related papers, but most of the papers are in Chinese. There are quite a few papers that introduce the research achievements of a project winner [2-3], some papers analyze the development background of project winners [4-5], Z. Gao reviewed the achievements of the NSFDYS for the past 20 years [6], W. Zhao compared the universities that obtained the NSFDYS and Excellent Young Scientists Fund [7], B. Liu analysis the funding status and achievement impact of NSFDYS in life sciences[8], X. Chen studied the promotion of NSFDYS to scientific research in universities [9], and some scholars have put forward suggestions for NSFDYS working mode [10]. At present, there is a little statistical research on the latest situation of NSFDYS. So This paper will use annual statistical data from the National Natural Science Foundation of China to analyze the funding scale and approved programs distribution of this program in 2017.

II. The Amount of Funding and The Overall Approval Rate

National Natural Science Foundation of China has 8 departments of different discipline categories, the detailed discipline catalogue is shown in Table I.

In 1994, funding for NSFDYS was 600 thousand Yuan per project, and two years later, it was adjusted to 800 thousand Yuan. In 2000s, funding was increased to 2 million Yuan. In 2017, there are two criteria for funding depending on the discipline. The funding for each project in most disciplines is 3.5 million Yuan per project, and only mathematics and management is 2.45 million Yuan per project.

In 2017, there were 2,684 applications in all disciplines, and only 198 projects were finally approved. The overall approval rate was 7.38%. The application and approval of each department are shown in Table II. As can be observed in the table, the approval rate (number and funding) of each department is all about 7%. The differences between the different departments are

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small, mathematics, chemistry, management and engineering are slightly higher, and medicine is marginally lower.

TABLE I. EIGHT DEPARTMENTS OF NATIONAL NATURAL SCIENCE FOUNDATION OF CHINA

	Department	Keyword	Discipline catalogue
1	Department of Mathematical and Physical Sciences	Mathematics	Mathematics, Mechanics, Astronomy, Physics
2	Department of Chemical Sciences	Chemistry	Inorganic Chemistry, Organic Chemistry, Physical Chemistry, Polymer Science, Analytical Chemistry, Chemical Engineering and Industrial Chemistry, Environmental Chemistry
3	Department of Life Sciences	Life	Microbiology and Botany; Ecology and Forestry; Biophysics, Biochemistry and Molecular Biology, Biomechanics, Tissue Engineering, and Immunology; Neurology, Cognition and Psychology, Physiology and Integrative Biology; Genetics and Bioinformatics, Cell Biology, Developmental Biology and Reproductive Biology; Food Science, Agricultural Basis and Crop Science; Plant Protection, Horticulture and Plant Nutrition; Zoology, Animal Husbandry and Grassland Science, Veterinary Medicine and Aquatics
4	Department of Earth Sciences	Earth	Geography, Geology, Geochemistry, Geophysics and Space Physics, Atmospheric Science, Marine Science
5	Department of Engineering and Materials Sciences	Engineering	Metal Materials, Inorganic Nonmetallic Materials, Metallurgy and Mining, Mechanical Engineering, Engineering Thermo Physics and Energy Utilization, Electrical Science and Engineering, Building Environment and Structural Engineering, Water Science and Ocean Engineering
6	Department of Information Sciences	Information	Information Science
7	Department of Management Sciences	Management	Management Science
8	Department of Health Sciences	Health	Medical, Pharmacy

Source: The official website of National Natural Science Foundation of China: http://www.nsfc.gov.cn

TABLE II. THE OVERALL APPROVAL RATE OF NSFDYS IN 2017

Department	Application		Approved		Approval Rate	
	Number of Project	Total Funding (million Yuan)	Number of Project	Total Funding (million Yuan)	Percentage of Application Number	Percentage of Application Funding
Mathematics	311	1012.9	24	77.7	7.72	7.67
Chemistry	393	1375.5	30	105	7.63	7.63
Life	353	1235.5	26	91	7.37	7.37
Earth	286	1001	21	73.5	7.34	7.34
Engineering	501	1753.5	38	133	7.58	7.58
Information	399	1396.5	28	98	7.02	7.02
Management	92	225.4	7	17.15	7.61	7.61
Health	349	1221.5	24	84	6.88	6.88
Total	2684	9221.8	198	679.35	7.38	7.37

Source: National Natural Science Foundation of China, “Statistical data of the National Natural Science Foundation of China in 2017”, unpublished

III. ANALYSIS OF THE DISTRIBUTION OF APPROVED PROGRAMS

A. Department Distribution

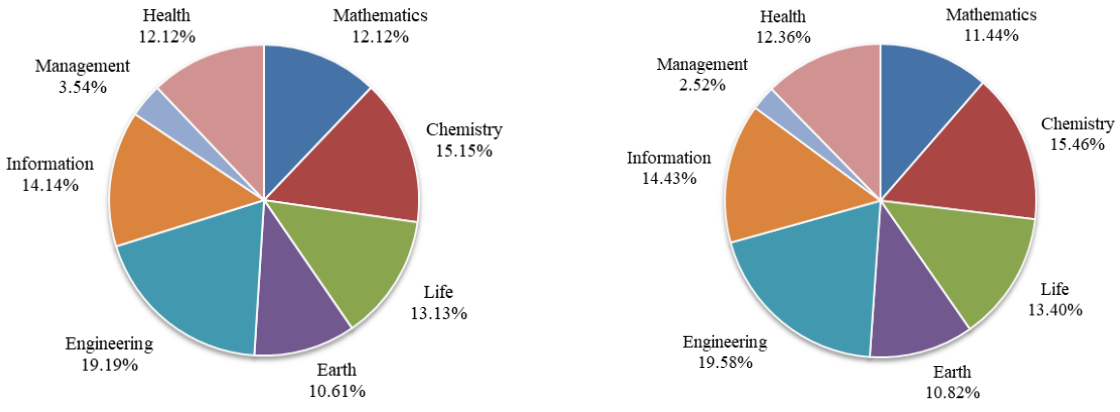

Fig. 1. The department distribution of number of projects approved (left) and the total funding (right) in 2017

According to the number of projects approved and the funding in each department, the two proportions can be calculated. The pie chart is shown in Figure 1.

Due to the two standards of funds, the two percentages is slightly different. From the figure, we can see that the proportion of engineering departments is the largest, the proportion of management departments is the smallest, and the development of other departments is relatively balanced.

B. Regional Distribution

According to the province of scholars, the approved projects are arranged in Table III, including the number of projects, the proportion of projects, the cumulative percentage of projects, the number of funding, the proportion of funding, and the cumulative percentage of funding. At the same time, the distribution of the map was also visualized using the map of mainland China, as shown in Figure 2.

TABLE III. THE REGIONAL DISTRIBUTION OF APPROVED PROGRAMS IN 2017

Province	Number of Project	Percentage of Project	Cumulative Percentage of Project	Amount of Funding (million Yuan)	Percentage of Funding	Cumulative Percentage of Funding
Beijing	78	39.39	39.39	265.65	39.10	39.10
Shanghai	37	18.69	58.08	128.45	18.91	58.01
Jiangsu	14	7.07	65.15	49	7.21	65.22
Hubei	12	6.06	71.21	40.95	6.03	71.25
Anhui	9	4.55	75.76	31.5	4.64	75.89
Zhejiang	9	4.55	80.30	31.5	4.64	80.53
Guangdong	6	3.03	83.33	21	3.09	83.62
Shaanxi	5	2.53	85.86	17.5	2.58	86.19
Liaoning	5	2.53	88.38	17.5	2.58	88.77
Hunan	5	2.53	90.91	17.5	2.58	91.34
Jilin	4	2.02	92.93	14	2.06	93.41
Tianjin	3	1.52	94.44	8.4	1.24	94.64
Sichuan	3	1.52	95.96	8.4	1.24	95.88
Chongqing	2	1.01	96.97	7	1.03	96.91
Heilongjiang	2	1.01	97.98	7	1.03	97.94
Yunnan	1	0.51	98.48	3.5	0.52	98.45
Fujian	1	0.51	98.99	3.5	0.52	98.97
Shandong	1	0.51	99.49	3.5	0.52	99.48
Jiangxi	1	0.51	100.00	3.5	0.52	100.00
Total	198	100	100	679.35	100	100

Source: Summarized from Statistical data of the National Natural Science Foundation of China in 2017, and calculated by the author

Fig. 2. The visualization of regional distribution of the number of approved programs in 2017

Table III and Figure 2 show that, in 2017, Beijing and Shanghai have the largest number of projects approved, accounting for 39.39% and 18.69% of the country. There are more in eastern China, central China, northeast and southern China, and

fewer in other regions. There are several provinces that have not obtained NSFDYS, the differences between regions are very significant.

C. Institutional Distribution

According to Statistical data of the National Natural Science Foundation of China in 2017, 73.74% of the approved projects belong to the universities, and 26.26% of the projects belong to the research institutions. There are three universities with more than 10 winners, 17 from Peking University, 13 from Tsinghua University, and 11 from Fudan University. There are three universities with 5-9 winners, 8 from China University of Science and Technology, 5 from Zhejiang University, and 5 from Wuhan University. Therefore, if a scholar does not work in the best batch of universities in China, it will be very difficult to obtain NSFDYS.

IV. Conclusion and Suggestion

National Science Fund for Distinguished Young Scholars is one of the most important national research programs in China, supports young scholars who have made outstanding achievements in basic research to select their own research directions and conduct creative research. This paper uses annual statistical data from the National Natural Science Foundation of China to analyze the funding scale and approved programs distribution of this program in 2017. The result shows that, the overall approval rate of the project is 7.38%, and the amount of funding for each project in most disciplines is 3.5 million Yuan, only mathematics and management disciplines are 2.45 million Yuan per project. Among the approved projects, the proportion of engineering & materials disciplines is 19.58%, which accounts for the largest proportion; the proportion of management disciplines is 2.52%, which accounts for the smallest proportion. Beijing and Shanghai have the largest number of projects approved, accounting for 39.39% and 18.69% of the country. Some provinces have only received a small number of projects, and some have not. 73.74% of the approved projects belong to the universities, and 26.26% of the projects belong to the research institutions.

The National Natural Science Foundation of China should optimize the National Science Fund for Distinguished Young Scholars to render it more effective. First of all, more scholars should be encouraged to take part. In fact, there are many exceptional talents in each province, and every province deserves benefits. Scholars in management disciplines should apply more actively. Secondly, the National Natural Science Foundation of China should increase the approval rate. If a scholar is the top talent in the field, it should be funded. The government should not artificially control the funding rate of 7% and 200 projects per year. Finally, the government should optimize the amount of funds, increase funds year by year, increase its proportion of GDP, simplify the use of funds, highlight the value of people, and improve the overall efficiency of funds.

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