DATA PAPER

# Cash–per–publication policy in China´s higher education institutions (1999—2016)

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**ABSTRACT**

The purpose of this dataset is to present the cash-per-publication policy in China's higher education institutions. This dataset includes 168 university documents from 100 Chinese universities at different tiers and from different regions. The dataset demonstrates the historical development of China's monetary reward policies in higher education, and the degree of cash award for individual publications.

## Background & Summary

Although monetary rewards have been used for recognizing scientific achievement since the eighteenth century, it is not regarded as the major reward system in science (Merton, 1973), in which scientists try to publish their works and receive the recognition of their peers as the reward. Since academic prizes consisting of cash rewards are awarded only to very few scientific elites, they are considered as the metaphors of prestige rather than simply large sums of money (Zuckerman, 1992). However, the reward system in science changed when the monetary reward incentive for publication was introduced in 1980s in UK. It is reported that this incentive can promote research productivity (Franzoni et al., 2011) but might create a negative goal displacement effect (Frey et al., 2013; Osterloh & Frey, 2014).

Since the early 1990s, Chinese research institutions have initiated the cash-per-publication reward polices in which Chinese scholars could get cash for each eligible publication. The purpose of publishing their works is not only to advance knowledge and win recognition, but also to earn money (Sun & Zhang, 2010; Wang, 2016). Since these cash-per-publication reward policies vary by institution and some policies are internal or confidential, they have never been systematically investigated except in some case studies. The purpose of this dataset is to present the landscape of the cash-per-publication reward policy in China and reveal its trend since the late 1990s.

## Methods

In order to present the landscape of the cash-per-publication reward policy in China, I sampled 100 Chinese universities and investigated their cash reward policies since the 1990s. Both stratified sampling and convenience sampling were used.

First, considering the 3-tier pyramid hierarchy of Chinese universities and regional differences, all 1,236 Chinese universities were classified into 21 categories by tiers and regions. Second, I tried to retrieve the cash reward policies from universities in each category to en-

sure that the sample is representative. Since most cash reward policies are recorded in internal documents that may not be externally accessible, I had to select universities from each category based on data availability. I used the Chinese search engine Baidu to locate such information and retrieved it from the official websites of each selected university. Finally, a manual validation was conducted to ensure that the retrieved documents were official and valid.

100 Chinese universities were selected for the investigation: 25 universities in Tier 1, 33 universities in Tier 2, and 42 universities in Tier 3. The samples also represent Chinese universities from all seven regions in China. Since some Chinese universities had multiple cash reward policies (e.g., modified or new ones), two or more cash reward policies were found in some universities during the period of the investigation. Eventually, 168 cash reward policies were retrieved from these 100 universities. 45 universities contributed one policy each, while 45 universities contributed two; Zhejiang University and Guizhou Normal University issued five and four cash reward policies, respectively, while 8 universities contributed three each. The first cash reward policy that I found was issued in 1999; the number of cash reward policies increased afterwards and reached its peak of 21 in 2015. Eight policies were even issued in 2016 as I started this investigation.

## Technical Validation

Due to limited data availability, I did not use random sampling for data collection, which is a limitation for this study. When comparing the science and technology personnel (S&T personnel), number of international publications, research funding received, and the number of graduate students between the sample and the population, I found that the means of these indicators from the sample Tier 1 universities were very close to those means from all Tier 1 universities, while the means from the sample Tier 2 universities were only a little higher than the means from all Tier 2 universities. The Tier 3 sample seemed to include many top Tier 3 universities so that the sample means were much higher than the average of all Tier 3 universities. I also did the one-sample $T$-test ($\alpha$ =0.05) comparing the sample means with the population means to test whether the samples are representative. As Table 1 shows, I did not find any significant difference between sample and population in all four indicators in Tier 1 and Tier 2 and one indicator (S&T personnel) in Tier 3; significant difference was found between the Tier 3 sample and population in terms of the number of international publications, the research funding received, and the number of graduates. The $T$-test indicated that the Tier 1 and Tier 2 samples represented the population well while the Tier 3 sample was a little weak in this study.

Each cash reward policy contains various specifications about its criteria for the eligibility, amount, formula for calculation, and method of payment. It was difficult to compare different cash reward policies with different specifications. In order to compare the cash reward policies issued by different universities in different years, I selected some journals as examples and calculated the amounts of cash reward for a single research paper published in these journals according to different cash reward policies. The selected journals represent journals with different Journal Impact Factors (JIFs) and in different Journal Citation Report (JCR) Quartiles. For a good understanding of the comparison, a list of nine popular journals that could be recognized by readers were selected, including four multidisciplinary science journals (the first 4) and five library and information science journals (the last 5).

Both the JIFs of selected journals and the JCR Quartile in which these journals are located were used to calculate the amount of cash reward in most cash reward policies. Please note

**Table 1**  Comparison of stats between the sample universities and all universities in average (2014)

| Indicators | Tier 1 | | | Tier 2 | | | Tier 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Sample | All | Difference | Sample | All | Difference | Sample | All | Difference |
| S&T personnel | 5,182 | 4,830 | 0% | 2,228 | 1,822 | 0% | 1,045 | 831 | 0% |
| International publications | 3,071 | 2,896 | 0% | 807 | 684 | 0% | 290 | 136 | 30.9% |
| Research funding (USD: in millions) | 205.97 | 210.68 | 0% | 62.16 | 56.43 | 0% | 19.05 | 9.16 | 32.8% |
| Number of graduate students* | 16,176 | 15,700 | 0% | 7,937 | 7,071 | 0% | 3,348 | 1,209 | 105.1% |

Source: Ministry of Education of China (2014); * provided by Research Centre for China Science Evaluation (RCCSE) at Wuhan University; Difference in this table refers to the relative measure of hypothesized mean difference in the one-sample $T$-test ($\alpha = 0.05$). For example, 0% means that no significant difference between the sample mean and population mean, while 30.9% means that the mean difference is equal to 30.9% of the population mean.

that 5-year JIF instead of 2-year JIF was used because the former was used more frequently by Chinese universities. Also, the JCR Quartile applied to the cash reward policies is not the original one with four equal quarters, but a modified one made by the Chinese Academy of Sciences. Compared with the original JCR Quartile grouping journals in each discipline into four equal quarters, the modified JCR Quartile use a pyramid hierarchy instead: only the top 5% of journals in each discipline are grouped into the Q1, while journals ranked in 5%-20%, 20%-50% and the bottom 50% are grouped into Q2, Q3 and Q4 in the modified JCR Quartile, respectively.

## Data Records

The dataset is stored in a Microsoft Excel file "Cash–Award–Policy", which is in Figshare with a DOI as 10.6084/m9.figshare.21979967. The "Cash–Award–Policy" file is a summary of all cash–per–publication policies after data analysis.

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