

# International student mobility to China: The effects of government scholarship and Confucius Institute

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## Abstract

Government scholarship plays an active role in attracting foreign students and promoting higher education exports. As a culture and education platform, Confucius Institute is also likely to affect the number of foreign students in China. Using the data from 188 countries over the 2003–2018 period, we find globally both attract more international students to China. In addition, government scholarship has stronger impacts on degree-seeking students whereas Confucius Institute affects non-degree-seeking students more. At the continental level, government scholarship remains effective, particularly for degree-seeking students. Confucius Institute, however, display opposing impacts for different continents. As the number of the Institute increases in a country, there will be more foreign students if the continent is of higher income, geographically more distant from China, or culturally less exposed to China; and vice versa. Globally and for most continents, we observe Confucius Institute affects the positive effect of Chinese government scholarship. The results offer policy implications for government scholarship allocation decisions.

## Keywords

Chinese government scholarship, confucius institute, international student, continent level analysis

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## Introduction

International student education is an important part of the internationalization of higher education and the buildup of world-class universities in China. As China's economic strength increases and the level of higher education improves, the number of international students continues to increase in recent years until 2020. China ranks third in the number of higher education students in the world after the US and the UK. In 2016, a total of 443,000 international students studied in China (an increase of 11.4% over 2015) whereas 545,000 Chinese students studied abroad (accounting for 17.4% of the global international students).<sup>1</sup>

Several factors influence the destination choice of international students to study in China. We focus on the policy side, specifically, government scholarships and Confucius Institute. Both are expected to produce impacts varying across continents and student types (i.e., degree-seeking and non-degree-seeking). [Caruso and de Wit \(2015\)](#) study the determinants of mobility of student in Europe and demonstrate that students are likely to choose countries where they are granted with adequately funded services or monetary incentives.<sup>2</sup> While there are different scholarships available for international students, government scholarships are the main sources with the largest number of beneficiaries. [Wang \(2022\)](#) argues Chinese government scholarship boosts quality inferences which, in turn, enhances China's brand perceptions among international students. There is currently no paper investigating the effect of the government scholarship on the inbound foreign students.<sup>3</sup> [Bhandari et al., \(2018\)](#) suggest it is mainly due to data availability. This paper is therefore the first to present the effects of government scholarships on inbound foreign students.

When discussing inbound foreign students in China, Confucius Institute (CI) must be taken into consideration. CI aims at promoting Chinese language, culture, and Sinology globally. It offers scholarships to foreign students to study in China, provides foreign students with convenient consultation services, and hosts various large-scale activities that help international students appreciating and further exploring China and Chinese culture. Thus, one expects CI to increase foreign students in China. However, CI also offers a substitution effect. Specifically, since CI offers various programs and courses, a foreign student who initially plans to study abroad in China may change mind and elect to stay home participating in the CI program, to save financial and other costs (such as life adjustment). As a consequence, CI reduces the number of foreign students in China. The final result depends upon the tradeoff between the attraction effect and the substitution effect. In Asia and Africa, the lower per capita GDP leads the substitution effect to dominate the attraction effect. Hence, the number of inbound students from Asia and Africa will decrease when the number of CI increases. In Americas and Europe, the higher per capita GDP enables the attraction effect to dominate the substitution effect; thus, CI increases foreign students in China.<sup>4</sup>

We adopt the two-way fixed effect gravity model controlling for several confounding variables. The approach is generally adopted as the default methodology to estimate the causal effects for panel data ([Imai & Kim, 2021](#)).<sup>5</sup> One common justification is the equivalence between the two-way fixed effect estimator and the difference-in-differences estimator under the simplest setting with two groups and two time periods ([Imai & Kim, 2021](#)). The empirical findings support our predictions of the universal effectiveness of government scholarship and the contrasting effects of CI across different continents. On the other hand, [Imai & Kim \(2021\)](#) and [Hill et al. \(2020\)](#) point out the limitations of the two-way fixed effect. Thus, caution should be applied when attempting to generalize the conclusions of this paper.

The structure of the paper is as follows. We begin with the discussion of the significance of international student education in China, the continental structure of the international students, and the distribution of Chinese government scholarship among international students. Then we introduce a gravity model to analyze the determinants of China's international student flows,

including Chinese government scholarship, Confucius Institute, and other socio-economic variables. We also separate the international students into degree-seeking and non-degree seeking groups, and explore the determinants for each group globally. Next, we apply the analysis to each continent. In the conclusion section, we offer a number of policy suggestions.

## Literature review

International student education has a profound and long-term impact for both the national strategy and the development of universities. Choudaha (2017) identifies three waves of international student mobility highlighting that institutions continue to be under increasing financial and competitive pressures to attract and retain international students.<sup>6</sup> Beech (2014) suggests that social networks of friendship and kinship are critical determinants for students deciding whether or not to study overseas.

Beine et al. (2014) explore the determinants of international student mobility and find both cost factors and the quality of universities play a significant role. Wei (2013) documents that the volume of merchandise trade facilitates international student mobility. Gonzalez et al. (2011) conduct an empirical study on the Erasmus programme and find that country size, cost of living, distance, educational background, university quality, the host country language and climate all to be significant determinants. Kritzl (2016) argues that outbound student mobility is negatively and significantly related to sending country's tertiary supply whereas population (GDP) has a negative (positive) effect. Kondakci et al. (2018) find the emergence of some non-traditional destinations owing to a balance of political, economic, cultural, historical, and ecological factors. In a recent article, Matsuzuka and Gerard (2022) investigate the determinants of international student mobility to OECD countries with multiple indicators. Overall, educational and economic factors are considered by the international students from developing and developed countries, but the weights are different across the two groups (Perkins & Neumayer, 2014). Abbott and Silles (2016) further explore the differences in the determinants. While most studies focus on student inflows to OECD countries, Kaushai and Lanati (2019) find the international student mobility patterns differ across OECD and emerging countries.

Most studies of international student flows into China focus on government policies. Chen (2012) suggests that international student education policy needs to consider both the number and the quality of foreign students, choose a reasonable enrollment scale, and focus on cultivating featured disciplines while consolidating and strengthening existing advantages. Weerakkody and Jerez (2018) evaluates the meaning of success for international student success and the quality of experience. Cui (2014) argues China's pre-entrance education for international students does not meet the actual needs of international students. Zhang (2013) suggests China to adopt Germany's foreign student recruitment strategy. Wen et al., (2022) argue that the current condition of international student education in general, and particularly in China, is not well connected with the education ecosystem nor the socio-economic system.

There are few quantitative studies on international student education in China. Xu (2009) adopts a gravity model to examine the number of international students in China. Jiani (2017) provides a comprehensive study to explore the reasons that international students choose China as the higher education destination. Both Miao and Chen (2015) and Chen and Ha (2020) focus on the effects of Confucius Institute on foreign students.

## International student education in China

International student education is an important instrument to improve soft power and globalization of a country. Soft power is the leverage a country has that affects other countries to share similar

preferences (Nye, 2005). International students can enhance a country's soft power. Increased familiarity with the country's language and culture promotes the trust toward the country and her citizens. Upon returning, these former students would bring the knowledge of the language, culture, science and technology of the host country back home. In this regard, China's higher education has comparative advantages in specific disciplines and for developing countries. Overseas student education provides intellectual support for China's import and export trade, foreign investment, language and culture.

International education is also an effective channel for storing overseas friendship. With China's increasing role on the world stage, international friendship has become an important resource. International students help accumulate a wide range of contacts around the world connecting China and their home countries. At the university level, international student education is instrumental to achieve the world-class status through internationalization which requires foreign students to account for a certain proportion of the total number of students. The importance of international students to soft power and higher education internationalization is well recognized (Lomer, 2017; Stetar et al., 2010).<sup>7</sup>

In recent years, the Chinese government has been committed to promoting the growth of international students studying in China. Since September 1st, 2014, the government scholarship for international students has been raised, with the highest standard of 99,800 RMB per year for doctoral students. The scholarship will be used to cover the tuition fees, accommodation fees, living expenses, comprehensive medical insurance fees and international travel expenses. The Ministry of Education's "Notice on Accelerating the Construction of a Modern Vocational Education System and Promoting Key Tasks of Reform" issued in July 2023, explicitly states: "All regions and schools should adhere to 'education following production and production following education', and base themselves on the school's characteristic major, 'going out and bringing in', introduce foreign high-quality vocational education resources, expand the scale of international students studying in China, and strengthen several Chinese vocational education brands with international cooperation." This document clarifies the goal and path of promoting the internationalization level of Chinese vocational education.

There are three channels for international students to enter universities and colleges in China. First, colleges and universities independently recruit students who come at their own expense, with a limited number of Chinese government scholarships available. Second, domestic and foreign universities establish joint education programs with students and teachers exchanges. Third, students may come from the Chinese government scholarship program. A total of 279 universities participate in this program cultivating Chinese government scholarship students.

During the 2001-2018 period, the number of international students exhibits a clear upward trend in each continent. International economic conditions, along with major events in China and the home countries, have great impacts on the numbers of international students in China. For example, except for Africa, the number of international students from each continent drastically declined in 2003 due to the SARS. Compared with 2002, the number of students from the Americas decreased by 47.1%. During 2004 and 2005, the number of international students from each continent greatly increased to satisfy the demand for studying in China that was suppressed in 2003. The global financial crisis in 2008 also had a significant impact on China's international education. The annual growth rate of international students has fallen significantly in 2009 with negative growth rates in the Americas and Oceania.

The growth rate of international students in China declines in recent years. Many countries have adopted effective educational marketing methods to recruit overseas students. Colleges and universities in developed countries enlist the help of educational agencies to enhance the enrollment of international students. China is lagged behind in global competition. In addition, relative to other countries, the coverage of Chinese scholarships for overseas students is below par

and the number of awardees is small.<sup>8</sup> In 2018, the number of awardees reaches the record high when 12.8% of the international students received scholarships. The Ministry of Education sets the maximum amount of academic scholarships for international students at 2000 to 3000 RMB per semester.

Across different continents, the largest group of students comes from Asia, which peaks at 81.9% of the total international students in 2003.<sup>9</sup> Afterward, the share of Asian students gradually declined every year. European students rank second before 2017. Since 2008, the share of European students has been kept around 15% with a small upward trend, until 2015 it has been kept a downward trend. In 2018, the share is 15.0% (about 74,000 students). The share of international students from the Americas is fluctuating at 10% (except for 2003 and 2018). It was ranked third until recent years when the population of African students overtook the spot. In 2004, the share of African students is about 2%. It continues to increase over years and reaches 16.6% (about 82,000 students) and ranked second in 2018.<sup>10</sup> Oceania supplies the fewest international students to China. The share has never exceeded 2%. In 2018, there are only 6200 Oceanian students in China.

International students can be classified as degree-seeking and non-degree-seeking. Degree-seeking students include college students, undergraduate students, master students, and doctoral students. Non-degree students include general advanced students, senior advanced students, and short-term students. The proportions of degree-seeking and non-degree-seeking students vary across continents. There are fewer degree-seeking students from Europe, Americas, and Oceania than non-degree-seeking students. On the other hand, most students from Asia and Africa are degree seeking. For Africa, the number of degree-seeking students is about 3.9 times of the number of non-degree-seeking students in 2003 and 2.7 times in 2018. Overall, there is an upward trend for the share of degree-seeking students in each continent.

## Chinese Government scholarship

China's scholarships for international students mainly include government scholarships, provincial and municipal scholarships, university scholarships, corporate scholarships, Confucius Institute scholarships etc. Government scholarships are the main sources for overseas students with the largest number of beneficiaries. The scope of other scholarships is limited and the number of awardees is small. Due to data availability, this paper focuses only on the role and impact of Chinese government scholarships.<sup>11</sup>

As of 2015, the number of international students receiving Chinese government scholarships reached 40,600, and the coverage rate was 10.2%, which broke through the single-digit level for the first time in history. The coverage rate continues to increase over years and reaches 12.8%, that is, 63,041 international students receiving Chinese scholarships in 2018. Chinese government scholarship for foreign students is divided into degree-seeking student and non-degree-seeking student scholarships. With the increase in the number of international students, scholarships have also increased, but the trends vary across different student groups. Based upon the number of awardees, degree-seeking student scholarships accounted for 57.7% of the total scholarships in 2001. The share continued to increase each year and reached 89.9% in 2018 with 56,649 awardees. In contrast, the number of non-degree-seeking student scholarships moves in the opposite direction. In 2001, the scholarships had the largest share of 42.3% with 2473 awardees and then declined continuously, finally reached the lowest level of 10.1% in 2015.

The percentages for all international students, degree-seeking students, and non-degree-seeking students receiving government scholarships all decreased from 2001 to 2007. Thereafter, the percentages for all international students and degree-seeking students reversed direction and began to rise; the percentage for non-degree-seeking students, however, continued to skid.

Overall, degree-seeking students are most likely to receive government scholarships. In 2001, a total of 3368 degree-seeking students (i.e., 20.2% of all degree-seeking students) received the scholarships. In 2018, 56,649 degree-seeking students, 22.0% of them received the scholarships. As the percentage increased, the number of scholarship students in 2018 is 17 times that of 2001.

The percentage of non-degree students receiving a scholarship has always been relatively low, with the maximum of 5.5% in 2001 and less than 3% in each year since 2006. Clearly, Chinese government scholarships are gradually tilted toward degree-seeking foreign students, in line with China's desire to attract talents from the world, optimize the structure of student sources, and ensure the sustainable development of international student career.

When comparing across continents, except for 2007 and 2008, about 50% of Chinese government scholarship awardees come from Asia. During 2007 and 2008, more scholarships were offered to students from Africa and the Americas. Since 2008, the percentage of Asian students have continuously increased at the expense of the students from Africa and Europe. The percentages for the Americas and Oceania remained stable.<sup>12</sup> Additionally, degree-seeking students have better opportunities to obtain scholarships than non-degree-seeking students in each continent. The odds are 27.1, 70.9, 1.5, 2.6, and 1.2 for Asia, Africa, Europe, the Americas, and Oceania, respectively, in 2018.

## Confucius Institute

The Confucius Institute is an educational organization that promotes Chinese language and culture, spreads Sinology, and facilitates cultural exchange. The first CI was established in South Korea in 2004. By December 2018, China has established 548 Confucius Institutes and 1193 primary and secondary Confucius classroom in 154 countries and regions. There are 2.1 million registered students and 46,000 full-time and part-time teachers in Confucius Institutes around world. It should be particularly noted that in July 2020, Hanban, the headquarters of Confucius Institute, was renamed as the Center for Language Education and Cooperation under the Ministry of Education, and no longer responsible for Confucius Institute affairs. The Confucius Institute brand is now fully operated by Chinese International Education Foundation, a newly established foundation jointly initiated by 27 organizations. These organizations together with Chinese and foreign partners of Confucius Institute will continue to support the development of Confucius Institutes worldwide. The foundation will not be involved in the operation and management of overseas Confucius Institutes, and its support for Confucius Institutes will be mainly reflected in brand building, standard guidance, resource services, and ecological creation. Therefore, we can infer that the role of Confucius Institute in promoting Chinese language and culture overseas will not change.

[Starr \(2009\)](#) offers detailed discussions on the early development of CIs. As the CI network expands. It begins to produce positive impacts on China's international exchanges, such as trade, foreign direct investment and, in our case, foreign students to study in China ([Lien et al., 2012, 2014](#)).

By organizing various Chinese language training, academic research and dissemination of Chinese culture exhibitions, performances and competitions, CI offers international students better understandings of Chinese higher education. [Miao and Chen \(2015\)](#) demonstrate CI helps attract international students to study in China. However, [Chen and Ha \(2020\)](#) suggest otherwise.

[Paradise \(2009\)](#) suggests CI generates some soft power whereas [Zhou and Luk \(2016\)](#) argue CI offers little or no soft power at all. Embedded CI within the higher education internationalization framework, [Yang \(2007, 2010\)](#) remains optimistic. Since 2018, the political climates in Australia, Canada, the UK and the US are rather hostile to CIs, followed by a cascade of CI closures. By

2022, of the 118 Confucius Institutes that once existed in the US, 104 have closed or are in the process of doing so (Peterson et al., 2022).

## Research questions

This study seek to identify the specific causal mechanism of Chinese Government Scholarship and Confucius Institutes in a continent based on the scale of foreign students from that country that study in China. We hypothesize that the influence of Chinese Government Scholarship on the scale of foreign students in China is positive, and Confucius Institutes is a double-edged sword with both positive gravitation and negative substitution effects.

This study answers the following questions:

1. Is there any association between Chinese Government Scholarship and the attributes of foreign students?
2. Does the establishment of Confucius Institutes have a gravitational effect on the scale of foreign students studying to China?
3. Does Confucius Institute mitigate the positive effects the Chinese government scholarship has on the foreign students?

## Model specifications

In this paper, we investigate the effects of government scholarships and Confucius Institutes on the numbers of overseas students, overseas degree-seeking students, and overseas non-degree-seeking students in China, controlling other confounding factors.<sup>13</sup> To capture continental differences, we further carry out the above estimation for each continent. We apply the gravity model to analyze the determinants of international student flows. Specifically, we enlist Confucius Institutes, Chinese government scholarship, bilateral investment, bilateral trade and academic mutual recognition agreements to explain the number of students from a specific foreign country who choose to study in China. The basic model is described as follows

$$\ln X_{it} = \alpha + \beta_1 \ln GDP_{it} + \beta_2 \ln GDPch_t + \beta_3 \ln GDPdif_{it} + \beta_4 \ln(1 + CI_{i,t-1}) + \beta_5 \ln(1 + SOFS_{i,t-1}) + \beta_6 \ln FDIa_{it} + \beta_7 \ln TVWCa_{it} + \beta_8 SA_{it} + \beta_9 INT_{i,t-1} + \varepsilon_{it}, \quad (1)$$

where  $X_{it}$  is the number of foreign students in China from country  $i$  on year  $t$ .  $GDP_{it}$  is the gross domestic product of country  $i$  on year  $t$ , which has been considered to be a reliable indicator of the demand of country  $i$  for studying in China.  $GDPch_t$  represents the gross domestic product of China, which reflects China's ability to provide higher education to foreign students on year  $t$ .<sup>14</sup>  $GDPdif_{it}$  is the absolute value of the difference in GDP per capita between China and country  $i$  on year  $t$ , reflecting the similarities of economic level and demand structure between the two countries.  $CI_{i,t-1}$  represents the number of Confucius Institute in country  $i$  on year  $t-1$ . In order to reduce endogeneity concern, the number of Confucius Institute is lagged one year.  $SOFS_{i,t-1}$  is the number of Chinese students from country  $i$  who have received Chinese government scholarships in year  $t-1$ . Similarly, the number of student receiving Chinese government scholarships in year  $t$  has been replaced by the variable with a lag of one year as an independent variable.  $INT_{i,t-1} = \ln(1 + CI_{i,t-1}) \times \ln(1 + SOFS_{i,t-1})$  is the interaction term between Confucius Institute and government scholarship.  $FDIa_{it}$  is the ratio of the bilateral investment to the GDP of country  $i$ .  $TVWCa_{it}$  is the ratio of the bilateral trade to the GDP of country  $i$ .<sup>15</sup>  $SA_{it}$  concerns an agreement on the mutual recognition of academic credentials between country  $i$  and China. It equals to one if the country has signed a mutual recognition agreement with China by year  $t$ , and zero otherwise.

Finally,  $\alpha$  and  $\beta_j, j = 1, \dots, 9$ , are regression coefficients whereas  $\varepsilon_{it}$  is the error term. We consider the two-way fixed effect model by including both year and country fixed effects in equation (1).

Next, we separate degree-seeking from non-degree-seeking students for further analysis. Thus, for the global model,  $X_{it}$  in equation (1) is replaced by  $Xd_{it}$  (the number of degree-seeking students) and  $Xnd_{it}$  (the number of non-degree-seeking students), respectively. The model is then re-estimated after  $SOF S_{i,t-1}$  is replaced by  $SOF Sd_{i,t-1}$  (the number of degree-seeking foreign students who receive Chinese government scholarships) and  $SOF Snd_{i,t-1}$  (the number of non-degree-seeking foreign students who receive Chinese government scholarships), respectively. A similar approach is applied at the continental level.

A total of 188 countries worldwide over the 2003–2018 period are included in the sample. To allow the impact of the government scholarships to differ across continents, the model is regressed with data from countries in each continent separately. These continent subsamples are denoted by  $k$  where  $k = 1, \dots, 5$  corresponds to Asia, Africa, Europe, Americas, and Oceania, respectively.

## Data descriptions

The dependent variables of this study are the total numbers of foreign students and the number of foreign students from different continents. The data are derived from the *China Education Yearbook*, *China Education Statistical Yearbook*, *Brief Statistics of Foreign Students Studying in China*, *China Scholarship Council Annual Report*, and the website of the Ministry of Education of China. The gross domestic product of each country is obtained from the website of World Bank. We calculate  $GDPdif_{it}$  from the World Bank website. The number of Confucius Institute is derived from the official website of the Confucius Institute. The data for Chinese Government Scholarships, Government non-degree Student Scholarships and Chinese Government degree-seeking student Scholarships are obtained from *Brief Statistics of Foreign Students Studying in China* and *China Scholarship Council Annual Report*. Investment and trade data come from the WIST database. The Academic Mutual Recognition Agreement comes from the website of the Ministry of Education of China.

Table 1 provides the summary statistics for all the variables. The correlation coefficients between explanatory variables are low. Furthermore, we calculate the variance inflation factor (VIF) and find the values are all less than 2.18. Thus, multicollinearity is not a concern for the world aggregated data. Similar conclusions apply to all continental level data. The VIF results are available upon request.

## Estimation results

The estimation results are presented in Table 2. All the estimated coefficients are consistent with our expectations. The coefficients of  $\ln(1 + CI_{i,t-1})$  are 0.247, 0.156, and 0.312 for all students, degree-seeking students, and non-degree-seeking students, respectively. Except for degree-seeking students where the coefficient is significant at the 5% level, the other two coefficients are significant at the 1% level. That is, an increase in the number of Confucius Institutes this year will significantly increase the total number of foreign students studying in China next year. The percentage increase in non-degree-seeking students exceeds the percentage increase in degree-seeking students.

Chinese government scholarship promotes international students to study in China. The coefficients of  $\ln(1 + SOF S_{i,t-1})$ ,  $\ln(1 + SOF Sd_{i,t-1})$ , and  $\ln(1 + SOF Snd_{i,t-1})$  are 0.411, 0.456, and 0.191 for all students, degree-seeking students, and non-degree-seeking students, respectively. All are significantly positive at the 1% level. In contrast to Confucius Institute, Chinese

**Table 1.** Descriptive statistics and correlation coefficients.

| Variable    | Mean   | Std. Dev | lnX    | lnGDP  | lnGDPch | lnGDPdif | ln (CI + I) | ln (SOFs+I) | lnFDla | lnTWWCa | SA    |
|-------------|--------|----------|--------|--------|---------|----------|-------------|-------------|--------|---------|-------|
| lnX         | 5.045  | 2.322    | 1.000  |        |         |          |             |             |        |         |       |
| lnGDP       | 10.188 | 2.375    | 0.623  | 1.000  |         |          |             |             |        |         |       |
| lnGDPch     | 12.902 | 0.589    | 0.417  | 0.114  | 1.000   |          |             |             |        |         |       |
| lnGDPdif    | 8.327  | 1.478    | 0.245  | 0.411  | 0.264   | 1.000    |             |             |        |         |       |
| ln (CI + I) | 0.540  | 0.885    | 0.626  | 0.562  | 0.446   | 0.319    | 1.000       |             |        |         |       |
| ln (SOFs+I) | 3.393  | 1.852    | 0.848  | 0.370  | 0.388   | 0.070    | 0.506       | 1.000       |        |         |       |
| lnFDla      | 0.165  | 0.612    | -0.107 | -0.256 | -0.011  | -0.026   | -0.087      | -0.075      | 1.000  |         |       |
| lnTWWCa     | 10.564 | 1.264    | 0.249  | -0.095 | 0.292   | 0.011    | 0.107       | 0.247       | 0.145  | 1.000   |       |
| SA          | 0.239  | 0.427    | 0.470  | 0.423  | 0.050   | 0.063    | 0.449       | 0.350       | -0.062 | 0.000   | 1.000 |

**Table 2.** Determinants of inbound foreign students.

|                | Model      |            |            |
|----------------|------------|------------|------------|
|                | lnFS       | lnFSd      | lnFSnd     |
| lnGDP          | 0.286***   | 0.243***   | 0.238***   |
| lnGDPch        | 0.909***   | 0.806***   | 1.283***   |
| lnGDPdif       | 0.052***   | 0.030*     | 0.056**    |
| lnLCI          | 0.247***   | 0.156**    | 0.312***   |
| lnLSOFS        | 0.411***   |            |            |
| lnLSOFSd       |            | 0.456***   |            |
| lnLSOFSnd      |            |            | 0.191***   |
| lnFDIa         | 0.048      | 0.037      | 0.080      |
| lnTVWCa        | 0.075**    | 0.061*     | 0.133***   |
| SA             | 0.035      | 0.141      | −0.019     |
| lnLSOFSlnLCI   | −0.066***  |            |            |
| lnLSOFSdlnLCI  |            | −0.055***  |            |
| lnLSOFSndlnLCI |            |            | −0.118***  |
| _Cons          | −12.334*** | −11.020*** | −17.054*** |
| R <sup>2</sup> | 0.807      | 0.813      | 0.715      |

\*\*\*represent  $p < 1\%$ , \*\*represent  $p < 5\%$ , \*represent  $p < 10\%$ .

government scholarship has a bigger impact on degree-seeking students than on non-degree-seeking students.

The coefficients of the interaction term between Confucius Institute and Chinese government scholarship are  $-0.066$ ,  $-0.055$ , and  $-0.118$  for all students, degree-seeking students, and non-degree-seeking students, respectively. All are significantly negative at the 1% level. That is, Confucius Institute mitigates the positive effects the Chinese government scholarship has on the foreign students, particularly non-degree-seeking students. The substitution relationship between the two policy tools suggest a better portfolio can be constructed to maximize the global impacts on inbound foreign students to China.<sup>16</sup>

It is worthwhile noting that, when the interaction term is not included in the model, the effect of the missing variable produces a significantly negative coefficient for Confucius Institute, which is consistent with [Chen and Ha \(2020\)](#). Chinese government scholarships remain to have significantly positive impacts on inbound foreign students. The estimation results are presented in [Table A2](#) of the Appendix.

All other coefficients are consistent with general expectations. The coefficients of gross domestic product (GDP) for China and the partners are both significantly positive across all students, degree-seeking students, and non-degree-seeking students. The effects are stronger for non-degree-seeking students. Specifically, a 1% increase in the GDP of the partner country increases the number of foreign students, foreign degree-seeking students, and foreign non-degree-seeking students by 0.286%, 0.243%, and 0.238%, respectively. The corresponding numbers for a 1% increase in the GDP of China are 0.909%, 0.806%, and 1.283%, respectively. As expected, the GDP of China has a greater impact on inbound foreign students. The pull factor is stronger than the push factor in attracting foreign students to China.

The coefficients of  $GDPdif_{it}$  are 0.052 and 0.056 for all students and non-degree-seeking students, significant at 1% and 5% levels, respectively. Larger differences in GDP per capita signals different economic structure, culture, and values. The demand for more information and knowledge promotes more non-degree-seeking students. On the other hand, degree-seeking

students are motivated by specialized field knowledge, only mildly responding to the GDP per capita difference. The coefficient is 0.030, significant at the 10% level.

Similarly, bilateral trade between China and the home country plays an important role for non-degree-seeking students but not for degree-seeking students. A 1% increase in the ratio of trade to GDP leads to 0.133% (significant at the 1% level) increase in the number of non-degree-seeking students and 0.061% (significant at the 10% level) increase in the number of degree-seeking students, respectively. Trade with China enhances values of knowledge toward China in job perspectives, and thus motivates non-degree-seeking students. The number of total students increases by 0.75% when the ratio of trade to GDP increases by 1%, which is significant at the 5% level. FDI and the agreement on the mutual recognition of academic credentials have no effects on the number of inbound foreign students to China.

## Continental level analysis

We now consider the effects of Confucius Institute and Chinese government scholarship across different continents. In [Table 3](#), we present the estimations results for Europe, Americas, and Oceania. The conclusions obtained from the global sample data are generally preserved. Specifically, in Americas, CI has a significantly positive effect for all students, degree-seeking, and non-degree seeking students. The number of non-degree seeking students increases more than that of degree-seeking students when the number of CI increases. Chinese government scholarship also attracts both types of students with stronger effects on degree-seeking students. The coefficients of the interaction term between CI and government scholarship are negative for all the three equations and significant at the 5% level. The mitigation effect is stronger for the non-degree-seeking students. Overall, the Americas sample shows the same qualitative properties as the global sample does (see [Table 3](#)).

For the European countries, CI has a significantly positive impact on the degree-seeking students but does not affect the non-degree-seeking students. The result differs from that of the global sample. For European students, CI offers comprehensive information on Chinese universities and their programs, and hence has a bigger impact on degree-seeking students. Chinese government scholarship exhibits a similar pattern in the European sample to the global sample. That is, when the scholarship increases, the number of foreign students, degree-seeking foreign students, and non-degree-seeking foreign students all increase significantly with the magnitude being larger for degree-seeking foreign students. The interaction term is significantly negative for degree-seeking foreign students only. Overall, the conclusions from the global sample are fully preserved in the case of degree-seeking students and total student (except that the coefficient of CI is significant only at the 10% level) and partially for non-degree-seeking students.

The sample size of Oceania is small compared to other continents. We find CI has no impact on inbound students whereas Chinese government scholarship significantly increases the number of degree-seeking foreign students and the number of total inbound students. The interaction term between CI and Chinese government scholarship is significantly negative for degree-seeking students only. In sum, the findings of the global sample are validated for the degree-seeking students (except that CI has no effect) and for total students (albeit the coefficients of CI and the interaction term are significant only at the 10% level).

[Table 4](#) presents some contradicting results for Asia and Africa samples. In Asia, CI has a significantly negative effect and Chinese government scholarship has a significantly positive effect on the degree-seeking students. Neither has any impact on the non-degree-seeking students and total students. The interaction term, however, is only significantly negative for the non-degree-seeking students. Asian students generally have adequate contacts with Chinese language and culture. Some may plan to study abroad in China for advanced language training. The

**Table 3.** Determinants of inbound foreign students (Europe, Americans, and Oceania).

|                | Europe   |           |          | America   |          |           | Oceania  |           |           |
|----------------|----------|-----------|----------|-----------|----------|-----------|----------|-----------|-----------|
|                | InFS     | InFSd     | InFSnd   | InFS      | InFSd    | InFSnd    | InFS     | InFSd     | InFSnd    |
| InGDP          | 0.461*** | 0.416***  | 0.508**  | 0.049     | 0.035    | 0.033     | -0.033   | -0.242    | -0.18     |
| InGDPch        | 0.712*** | 0.466***  | 0.833*** | 0.963***  | 0.720*** | 1.540***  | 0.679**  | 0.719***  | 1.144***  |
| InGDPdif       | 0.115*** | 0.064*    | 0.160*** | 0.001     | —        | -0.080*   | -0.022   | -0.03     | 0.197**   |
| InLCI          | 0.243**  | 0.421***  | 0.164    | 1.028***  | 0.416**  | 0.498***  | 0.677*   | 0.184     | 0.578     |
| InLSOFS        | 0.311*** | —         | —        | 0.388***  | —        | —         | 0.733*** | —         | —         |
| InLSOFSd       | —        | 0.540***  | —        | —         | 0.426*** | —         | —        | 0.770***  | —         |
| InLSOFSnd      | —        | —         | 0.177*** | —         | —        | 0.317***  | —        | —         | -0.025    |
| InFDIa         | -0.258   | -0.366    | -0.353   | 0.151     | 0.175    | 0.113     | 0.03     | 0.01      | 0.071     |
| InTVWCa        | -0.010   | -0.012    | -0.012   | 0.021     | 0.019    | -0.011    | -0.124   | -0.112    | -0.392*** |
| SA             | 0.295*** | 0.283***  | 0.267**  | -0.209    | -0.024   | -0.262    | —        | —         | —         |
| InLSOFSInLCI   | -0.033*  | —         | —        | -0.201*** | —        | —         | -0.155*  | —         | —         |
| InLSOFSdInLCI  | —        | -0.091*** | —        | —         | -0.091** | —         | —        | -0.156*** | —         |
| InLSOFSndInLCI | —        | —         | -0.024   | —         | —        | -0.155*** | —        | —         | -0.145    |
| _Cons          | -11.6*** | -9.31***  | -13.7*** | -10.2***  | -7.58*** | -16.6***  | -5.34*** | -4.46***  | -8.39***  |
| R <sup>2</sup> | 0.826    | 0.917     | 0.718    | 0.848     | 0.821    | 0.716     | 0.876    | 0.886     | 0.592     |

\*\*\*represent  $p < 1\%$ , \*\*represent  $p < 5\%$ , \*represent  $p < 10\%$ .

**Table 4.** Determinants of Inbound Foreign Students (Asia and Africa).

|                | Asia     |          |           | Africa   |          |          |
|----------------|----------|----------|-----------|----------|----------|----------|
|                | lnFS     | lnFSd    | lnFSnd    | lnFS     | lnFSd    | lnFSnd   |
| lnGDP          | 0.523*** | 0.312*   | 0.767***  | 0.227*** | 0.261*** | 0.065    |
| lnGDPch        | 0.997*** | 1.028*** | 0.836***  | 0.872*** | 0.670*** | 1.637*** |
| lnGDPdif       | 0.089**  | 0.056    | 0.068     | 0        | −0.027   | 0.092**  |
| lnLCI          | −0.188   | −0.369** | 0.151     | −0.933** | −0.780*  | 0.127    |
| lnLSOFS        | 0.073    | —        | —         | 0.623*** | —        | —        |
| lnLSOFSd       | —        | 0.213*** | —         | —        | 0.684*** | —        |
| lnLSOFSnd      | —        | —        | 0.093     | —        | —        | 0.148*** |
| lnFDIa         | 0.030    | −0.018   | 0.065     | −0.087   | −0.068   | −0.177*  |
| lnTVWCa        | 0.353*** | 0.313*** | 0.377***  | −0.115** | −0.109*  | 0.092    |
| SA             | 0.323    | 0.145    | 0.452     | —        | —        | —        |
| lnLSOFSlnLCI   | −0.017   | —        | —         | 0.229*** | —        | —        |
| lnLSOFSdlnLCI  | —        | 0.009    | —         | —        | 0.223*** | —        |
| lnLSOFSndlnLCI | —        | —        | −0.116*** | —        | —        | −0.059   |
| _Cons          | −17.4*** | −15.8*** | −19.1***  | −9.73*** | −7.88*** | −19.8*** |
| R <sup>2</sup> | 0.788    | 0.797    | 0.737     | 0.887    | 0.867    | 0.845    |

\*\*\*represent  $p < 1\%$ , \*\*represent  $p < 5\%$ , \*represent  $p < 10\%$ .

establishment of CI improves the learning environment at the home country offering a cheaper alternative. Consequently, there are fewer Asian students when the number of CI increases. This finding is consistent with [Chen and Ha \(2020\)](#). On the other hand, government scholarship remains an effective pulling factor for the degree-seeking students.

The number of inbound African degree-seeking students and total students both decrease (although the former is only significant at the 10% level) when the number of hosted CI increases. This observation is similar to that of the Asia sample. Chinese government scholarship has significantly positive impacts on both types of students. The coefficients of the interaction term are significantly positive for degree-seeking students and total students. Thus, an additional CI will reduce the number of degree-seeking students per se while enhancing the positive effect of government scholarship on the number of degree-seeking students.

In summary, across the five continents, Chinese government scholarship is the most effective tool to attract foreign students, particularly degree-seeking students. With a 1% increase in the government scholarships for degree-seeking students, Oceania responds the most (0.770%), followed by Africa (0.684%), Europe (0.540%), Americas (0.426%), and Asia (0.213%). If the government scholarships for non-degree-seeking students increase by 1%, Americas, Europe and Africa respond positively at 0.317%, 0.177%, and 0.148%, respectively. Scholarships do not play a significant role for non-degree-seeking students from Asia and Oceania. The finding suggest, when allocating scholarships, Chinese government should take into account this cross-continent difference.

Confucius Institute plays a conflicting role. It attracts both degree-seeking and non-degree-seeking students from Americas and degree-seeking students from Europe. Hence, the number of total students from Americas (Europe) increases when the number of CI increases. Similar conclusion applies to the number of total students from Oceania (at the 10% significance level though). In these continents, Confucius Institute provides comprehensive information about Chinese education environment and, therefore, attracts more foreign students to study in China. In Asia, CI significantly discourages degree-seeking students to China. In Africa, an increase in the

number of CI significantly reduces the numbers of all students and degree-seeking students at the 1% and 10% significance levels, respectively. For Asia and Africa, lower GDP per capita level causes the cost of studying in China to be a critical concern. Consequently, Confucius Institute serves as a viable substitute. With more CIs, fewer students elect to study in China. The interaction term between CI and Chinese government scholarship is often statistically significant with the sign opposing to that of CI. That is, when CI has a positive impact, an increase in CI reduces the positive effect of the government scholarship. When CI has a negative impact, an increase in CI strengthens the positive effect of the government scholarship. The evidence suggests Chinese government should consider the effect of CI when making scholarship allocation decisions.

Regarding other explanatory variables, FDI continues to have no effect on inbound foreign students. Trade plays an important role in attracting Asian foreign students. However, it reduces non-degree-seeking students from Oceania and Africa (at the 10% significance level). It is not obvious why trade discourages studying abroad in China except that trade deficits often create unfavorable public opinions toward China. Finally, mutual academic recognition agreement promotes more students of both types to China.

From the data of the Ministry of Education of China, in 2018, there were about 492,185 international students studying in China; in 2019, there were 488,200 registered international students, but due to the impact of the epidemic, the actual total number in China was 178,000. Facing a severe epidemic situation, the number of international students in China was 392,000 and 210,000 in year 2020 and 2021 respectively, and the number recovered to about 440,000 in 2022. Overall, excluding the impact of special factors such as the pandemic, the number of international students studying in China has shown an increasing trend. It can be seen that despite some countries' terminating agreements with Confucius Institutes, political disputes in some countries, and pandemic-related restrictions, they have not dampened the enthusiasm of international students to study in China. The reasons can be summarized as the following:

First, there are many economic development opportunities. China is the second largest economy in the world, with rapid economic development and constantly emerging business opportunities. Many international students believe that studying in China can provide more opportunities and enhance their career development potential.

Second, historical and cultural heritage attracts foreign students. China has a long history and splendid culture, which attracts many international students to come and learn and explore. Here, they can personally experience the profoundness of Chinese culture, including ancient Chinese philosophy, art, literature etc.

Third, foreign students want to gain the language skills. With the increasing influence of China on the global stage, Chinese has become an important language in the world. Many international students come to China to learn Chinese in order to be more competitive in the future career.

Fourth, there are relatively low living costs. Compared to some Western countries, China usually has lower living costs, including accommodation, transportation, and food. This makes China a comparatively affordable study destination.

Fifth, foreign students can get scholarships and financial aid. The Chinese government and many programs of CI provide various scholarships and financial support to help international students cover tuition fees and living expenses. These scholarship programs have attracted more students to come and study in China.

Within the international community, good bilateral relations can facilitate bilateral cooperation and multilateral cooperation in higher education. Good bilateral political relations can promote students from friendly countries to study in China. The positive effect has become more visible in recent years. For example, with the Chinese government placing increasing emphasis on bilateral relations with countries along the "Belt and Road" initiative, China's international exchange and cooperation in higher education with countries or regions along the "Belt and Road" have

developed rapidly, especially in terms of cooperation in higher education between China and India, Mongolia, Kazakhstan, Malaysia, and Russia. Currently, 25 countries along the “Belt and Road” have signed mutual recognition agreements on higher education degrees with China, while 41 countries have signed education and cooperation agreements, with content of language learning, cooperation in running schools and other fields. All these efforts will increase the number of international students in China.

On the other hand, hostile political relationship has had significant adverse effects on international educational exchanges. The Sino-US relation is one of the most important bilateral relations in the world today, with profound connections and extensive influence in economy, politics, security, culture, etc. In recent years, the relation has experienced serious setbacks, with the United States viewing China as its ‘main competitor’ and ‘the most significant geopolitical challenge’. The US military, its security policies, and diplomatic offensives will continue to target China and create tension.

Although there are many cultural exchanges and humanitarian cooperation projects between China and Europe, due to the alliance relationship between Europe and the United States, their policy positions towards China are becoming increasingly similar to those of the United States. Due to trade disputes and security strategy conflicts, the flow of international students from the United States and Europe has been significantly restricted. These changes not only affect students’ study plans, but also influence the country composition of foreign students studying in China.

Finally, the closure of Confucius Institutes in the United States and Europe have some damaging effects on local students. It produces a negative impact on students’ Chinese language learning and their understanding of China and Chinese culture, as the existence of Confucius Institutes is of great significance for international students studying in China, providing them with opportunities to learn Chinese and engage in cultural exchanges. We can foresee that the termination of Confucius Institute agreements in some regions will deprive local students of the opportunity to understand China and experience Chinese culture, which will directly result in a decrease in the enthusiasm of international students who are keen on Chinese culture to study in China.

## Concluding remarks

This paper uses the gravity model incorporating the two-way fixed effect to conclude that Chinese government scholarship has played a positive role in attracting both degree-seeking and non-degree-seeking foreign students, as well as all foreign students coming to China. The effect is stronger for the degree-seeking student than for the non-degree-seeking students.

At the continental level, scholarships for degree-seeking students have a greater marginal impact on Oceania, Africa, Europe, Americas, and Asia. The results could be due to the current relatively large (small) number of students from Asia (Oceania). For non-degree-seeking students, Americas, Europe and Africa all respond positively to the increases in government scholarships whereas Asia and Oceania are not affected. Confucius Institute is found to have greater impacts on non-degree seeking students than on degree seeking students. In Asia and Africa, CI reduces the number of foreign students, which is consistent with [Chen and Ha \(2020\)](#). Meanwhile, the numbers of foreign students from the other three continents increase as CI expands, similar to [Miao and Chen \(2015\)](#) and [Lien et al. \(2018\)](#).

We find a mitigation effect between CI and government scholarship. Specifically, when CI can promote international students, the positive effect of government scholarships is reduced as CI expands. On the other hand, if CI mainly reduces the number of international students, the positive effect of government scholarships is strengthened when CI expands.

Before the pandemics, Chinese government scholarship for international students has been influenced by China's good neighbor policy and the "Belt and Road" initiatives. Asian students are greatly benefited and have an absolute advantage in the total number of international students. At the China-Africa Cooperation Forum summit, Chinese government guarantees education support to Africa. The African students also increase rapidly. Additionally, the future development of Confucius Institute network also matches the "Belt and Road" initiatives.

As China is preparing to reopen the border to international students. There will be new development and policies of international education in China. Our analysis based upon earlier data can offer some useful suggestions. First, the distribution of government scholarships was previously based on the needs of national diplomacy rather than on which continent being more attracted to China. Secondly, Better allocation of scholarships between degree-seeking and non-degree-seeking students and close cooperation with Confucius Institute would be helpful. Beyond the government policy, Chinese higher education institutions need to improve core competitiveness. The key to increase the number of international students rely upon the quality of the university education. Chinese universities also need to learn how to market their education services when competing with universities from other countries. Fourthly, deep opening is badly needed. Universities should have an open and free academic environment. A survey of Institute of Education, Tsinghua University shows that the quality of teaching is the main factor in students' applications to study in China, and 7 out of the top 10 factors affecting international students' choices of schools are related to the internationalization level of the university. Fifthly, the universities should give foreign students standardized admission test. The qualification restrictions for admission are the first hurdle for ensuring the quality of international students. This can ensure the basic quality of international students who apply for studying in China. Otherwise, it will be difficult to meet the high demand of developed countries for short-term credit recognition, which objectively suppresses the willingness of high-end students to study in China. Finally, in recent years, many Chinese express dissatisfaction with the current international student education in China. The lower standard and large amount of scholarships awarded to international students stir up big debates, leading to a prejudice perception toward international students and a reduction of China's soft power with these students, which will adversely affects the decision to study in China for perspective students. This issue is in urgent need of a resolution.

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### **Notes**

1. Source: The Blue Book of International Talents: Report on the Development of China's Students Abroad (2017). The report is edited by Hui Yao Wang and Lv Miao, and published by Social Sciences Literature Press.
2. [Campbell and Neff \(2020\)](#) systematically review the importance of scholarships for students from Global South.
3. Several papers examine specific scholarship programs but none examines the general national scholarships. [Beine et al \(2020\)](#) and [Zullo and Olga Churkina \(2021\)](#) investigate the effects of tuition and fees at the university level on the number of foreign students.
4. Table 5 in [Chen and Ha \(2020\)](#) shows CI reduces the number of foreign students from low income countries but has no effects on high income countries, which is consistent with our finding. Table 6 shows the number of foreign students decreases in Asia, Americas, and Oceania but is not affected in Europe and

- Africa when the number of CI increases. The results differ from ours. Besides using different datasets, the major difference is the incorporation of government scholarship in the model specification in our paper.
5. [de Chaisemartin and D'Haultfœuille \(2022\)](#) find, among the 100 most cited papers published by the American Economic Review from 2015 to 2019, 26 of them adopt this approach to estimate policies' effects.
  6. Besides financial revenues, international education enhances a country's soft power. The concept of soft power was first proposed in [Nye \(1990\)](#). For the importance of higher education as a source of soft power, see [Nye \(2005\)](#).
  7. To some extent, international student education is an important source of income for a university. With China's reform and the development of a market economy, universities must have own income-generating projects in order to strengthen teacher training, improve teaching standards, update teaching equipment, and support scientific research.
  8. Many universities offer a variety of scholarships accommodating students for different degrees. Local governments, social organizations, private companies and individuals also provide other scholarship opportunities. Some national governments, enterprises, or universities adopt preferential policies allowing for tuition and fee reduction for outstanding students with financial difficulties.
  9. Since Chinese government always adopts a good-neighbor policy, the allocation of government scholarships is tilted toward Asia. In addition, China's higher education has an absolute advantage in Asia, which attracts Asian students. Consequently, Asian students have the largest share of international students in China.
  10. Since 2000, the Forum on China-Africa Cooperation Summit has granted financial and political support to education in Africa. Also, African students have been attracted by the economic development experience and business opportunity in China. Thus, there is a rapid growth of African students to study abroad in China ([Wang & Miao, 2017](#)).
  11. Chinese government scholarships are funded by Chinese government. The Ministry of Education makes plans and entrusts the China National Scholarship Fund Management Committee with the responsibility for the recruitment of scholarship students and the management of daily affairs. The protocol is jointly formulated by the Ministry of Education and the Ministry of Finance.
  12. The percentage of Oceanian students is low and steady within less than 1.5% fluctuation each year.
  13. There are many factors that affect an international student's decision to study in China. At the country destination level, the list includes learning advanced Chinese sciences and technology, grasping China's huge market opportunities, and understanding the Chinese culture and business environments. At the specific university level, the rankings of the target universities, professional advantages, school prestige, application success rate, study support services, post-graduation income, internship and employment, work immigration, and foreign student scholarship policies are all important.
  14. Since we control the time effect, the coefficient of China's GDP cannot be directly estimated. Instead, we run the regression without China's GDP to estimate the time effect. Thereafter, we run a regression of the estimated time effect on China's GDP to derive the estimate of the coefficient,  $\beta_2$ .
  15. We consider the ratio terms to avoid the multicollinearity problems between the numerators and the denominators.
  16. [Chen and Ha \(2020\)](#) show CI has a positive (negative) impact on the number of foreign students in scholarship (self-finance) program. [Shih and Cao \(2022\)](#) find the number of scholarship students in BRI countries increases faster than that in non-BRI countries.

## Supplemental Material

Supplemental material for this article is available online.

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