

# Influence Factors on China's Export Competitiveness of International Education Service Trade

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**Abstract:** Both developed and developing countries have attached great importance to attracting international students in the era of regarding talents as the key driving force of economic development. The growing inequality of export competitiveness of international education service trade between developing countries and developed countries leads to the flow of students mainly from developing countries rather than to developing countries. Empirical analysis of the factors affecting the international competitive advantage of international student education industry was carried out using the “diamond model”, through which it was found that the academic level and international recognition of higher education institutions, overseas tourism and the government’s educational expenditure had significant impact on the development of international student education industry in China. The key problem lies before the export of China education services in near future is how to convert the scale of international students to its national economic benefit.

**Keywords:** *Export competitiveness; International education service trade; Influence factor.*

Article Received: 28 Jan. 2020

Revised: 18 Feb. 2020

Accepted: 22 Feb. 2020

## Introduction

Internationalization of higher education has become the new development trend of higher education worldwide. One of the most visible and dynamic manifestation of internationalization of higher education is Student Mobility [1, 2].

More than 5 million students across the globe are receiving education in countries other than their home countries, a 67 percent increase from a decade ago and a marked acceleration in cross-border mobility. There are many factors affecting international mobility of students, which can be explained by a combination of push–pull model as well as individual characteristics, push factors operating within the home country initiating the student’s decision to study overseas while

pull factors within the host country to make that country relatively more attractive than other potential destinations [3]. Cased studies [4, 5, 6, 7, 8, 9] show that the determinants of international mobility of students varies but usually fall into 6 categories: educational conditions, economic benefits, personal career development, language, political stability, experiencing different cultural life.

Educational conditions and economic benefits are two of the most influential determinants among many factors [10], especially for students from less developed and developing countries to developed countries or regions [11]. Similar findings have held true in studies on Latin American students in Mexico [12] and on Brazilian Students in the United Kingdom [13].

Students from developed countries go to less developed or developing countries or regions, owing to a desire to experience a different culture [11]. Studies on international students in South Africa [12] and Turkey [7] also confirm this point. The latest decade has witnessed an unprecedented increase in the number of international student mobility in China. In terms of inflow student mobility, China in 2015 is the third-ranked destination for international students with a total of 397,000 from 202 origin countries and regions [14].

China has rapidly transformed itself into an international student “receiving” nation [10], which was contributed by the “pull” from the different cultural experiences, new knowledge and technique, different educational approaches, and more job opportunities, as well as by the “push” of the shortcomings in some aspects of domestic environment, such as international cultural exchange, educational methods, and opportunities for admission. Jiani [15] and Choudaha [16] noted that supportive government policy, scholarship policy and different cultural experience played a very crucial role in China’s leap to the third-ranked education destination for international college students.

This paper gives the theoretical analysis of the factors affecting the international competitive advantage of international student education industry on the “diamond model” proposed by Michael Porter to explore the main factors that affect China's international student education industry. The findings offer significant insights for understanding how external forces directly or indirectly influence the flow of international student into China, exemplifying how developing and less developed countries develop international student education in a non-English speaking context.

### Theoretical Basis

The education of international students is an important link of higher education industry and an important part of China’s higher

education services export. Studying abroad means that some students may face obstacles caused by multiple disadvantages [17]. Finance, manpower, community and cultural capital all have an impact on students' willingness to study abroad [18]. Based on Competitive Advantage of Nations Theory by Michael Porter, factors influencing the international competitive advantage of a certain industry in a country mainly include: production factors, demand factors, related and supporting industries, enterprise strategy, structure and horizontal competition, government support and opportunities.

According to Porter's diamond model, combined with the specific situation of China’s education service export, the influence factors on China's export competitiveness of education service trade can be summarized as follows. Production factors in the process of higher education internationalization are manifested as the software and hardware facilities, teaching resources and capacity, scientific research capacity, social reputation and other factors that determine the comprehensive strength of higher education.

In this paper, the total number of higher education institutions and the average scores of the world’s top 500 higher education institutions in the Academic Ranking of World issued by Shanghai Jiao Tong University were selected to reflect production factors from the perspective of quantity and quality (the total score includes the scores of six sub-items, including Alumni, Award, HiCi, N&S, PUB and PCP, the weights of which are 10%, 20%, 20%, 20%, 20% and 10% respectively).

Demand factors mainly include a country’s education scale, quality, level of internationalization and international competitiveness. Therefore, annual average exchange rate was also selected as an influential factor in addition to the gross enrollment ratio of higher education.

The internationalization of higher education involves a wide range of industries and complex relations. International tourism is the front of a country's outreach. For this reason, tourism industry for overseas tourists was selected as a consideration. In addition, overseas education agencies also affect education service export because the students sent via such agencies to study in foreign countries can help the local higher education institutions to better understand China's higher education.

In consideration thereof, the level of development of the international flight routes approved by the Civil Aviation of China was also included into the empirical analysis as an influential factor. Corporate strategy, structure and horizontal completion are negligible since most higher education institutions in China are public and non-corporate, and only few are private and corporate but rarely accepting international students.

The fiscal educational expenditure was also included into the scope of empirical analysis as one of the influential factors because education is a quasi-public product, in which the government plays an important role. For the factor of opportunity, policy documents and social events that will have a certain impact on the scale of international students

studying in China were selected for analysis, including SARS outbreak in 2003, the 2003-2007 Action Plan for Invigorating Education promulgated in 2004, 2008-2012 global financial crisis, Notice on Notice on Improving Chinese Government Scholarship System and Funding Criteria issued in 2014, "One Belt and One Road Scholarship" established in 2015, and the Measures for the Administration of the Recruitment and Training of International Students promulgated in 2017.

### Empirical Analysis and Basic Model

Table 1 shows the sample observations during the period from 2003 to 2017. The number of degree international students studying in China (A) was used as an explained variable. The total number of higher education institutions in China(B), the average scores of top 500 Chinese colleges and universities(C) included in the Academic Ranking of World issued by Shanghai Jiao Tong University, exchange rate(D), the gross enrollment ratio(E) of higher education in China, the number of overseas education agencies(F) in China, the number of overseas tourists(G) traveling to China, the total traffic turnover of international flight routes (H), and the proportion of national educational expenditure to national GDP(I) were used as explanatory variables.

**Table 1: Number of international students studying in China and related factors**

Year	Production factor			Demand factor		Supporting industries			Government
	A	B	C	D	E	F	G	H	I
2003	24636	1552	10.20	8.277	17.0%	74	9166.21	557794	0.045
2004	31591	1731	10.92	8.2768	19.0%	92	10903.82	774101	0.045
2005	44866	1792	12.16	8.1917	21.0%	136	12029.23	855235	0.045
2006	54828	1867	12.93	7.9718	22.0%	186	12494.21	1031319	0.045
2007	68231	1908	11.30	7.604	23.0%	258	13187.33	1299921	0.045
2008	80013	2263	11.30	6.9451	23.3%	330	13002.74	1288988	0.045
2009	93368	2305	11.44	6.831	24.2%	411	12647.59	1299511	0.045
2010	107361	2358	11.53	6.7695	26.5%	566	13376.22	1929689	0.047
2011	118800	2409	11.66	6.4588	26.9%	778	13542.35	1968352	0.047
2012	133586	2442	11.62	6.3125	30.0%	1051	13240.53	1944881	0.049
2013	147947	2491	12.14	6.1932	34.5%	1388	12907.78	2106757	0.053
2014	164394	2529	13.47	6.1428	37.5%	1926	12849.83	2401117	0.051

2015	184799	2560	13.96	6.2284	40.0%	2889	13382.04	2926107	0.051
2016	209966	2596	14.73	6.6423	42.7%	4381	13844.38	3405834	0.052
2017	214543	2631	15.05	6.7518	45.7%	6572	13948.24	3884753	0.052

Note: Data are from China Statistical Yearbook, China Education Statistical Yearbook, Concise Statistics on International Students in China, Academic Ranking of World issued by Shanghai Jiao Tong University, and www.tianyancha.com.

The opportunity link was set as dummy variable  $D_t$ . In 2003, 2008 and 2012, there were social events  $D_t = 1$ . In the years of 2004, 2014, 2015 and 2017, important overseas study education policies were issued  $D_t = 2$ , and the other years  $D_t = 0$ .

The data of all variables are positive and the values vary greatly, and thus in order to eliminate possible volatility, heteroscedasticity and multicollinearity, the regression equation is established after natural logarithm treatment for all variables except dummy variable  $D_t$ :

$$\ln Y_t = \beta_0 + \beta_1 \ln X_{1t} + \beta_2 \ln X_{2t} + \beta_3 \ln X_{3t} + \beta_4 \ln X_{4t} + \beta_5 \ln X_{5t} + \beta_6 \ln X_{6t} + \beta_7 \ln X_{7t} + \beta_8 \ln X_{8t} + \beta_9 D_t + \mu_t$$

Where  $Y_t$  denotes the total number of degree students in the  $t^{\text{th}}$  year;

$X_{1t}$  Denotes the total number of higher education institutions in China in the  $t^{\text{th}}$  year;

$X_{2t}$  Denotes the average scores of colleges and universities in China ranking among the world's top 500 in the  $t^{\text{th}}$  year;

$X_{3t}$  Denotes the annual average exchange rate in the  $t^{\text{th}}$  year (RMB to 1 USD);

$X_{4t}$  Denotes the gross enrolment ratio of higher education in the  $t^{\text{th}}$  year;

$X_{5t}$  Denotes the total number of overseas education agencies in China in the  $t^{\text{th}}$  year;

$X_{6t}$  Denotes the number of overseas tourists traveling to China in the  $t^{\text{th}}$  year;

$X_{7t}$  Denotes the total traffic turnover of international flight routes in the  $t^{\text{th}}$  year;

$X_{8t}$  Denotes the proportion of national education expenditure in the  $t^{\text{th}}$  year;

$\beta_0$  Is the regression constant,  $\beta_1 \beta_2 \beta_3 \dots$  are the respective regression coefficients, and  $\mu_t$  is the residual.

In order to better process the possible autocorrelation and heteroscedasticity to make the estimated values more valid, Eviews10 software was used to conduct generalized least square method for the sample observation data, and the regression results were as follows (Table 2):

**Table 2: Regression results**

Variable	lnx1	lnx2	lnx3	lnx4	lnx5	lnx6	lnx7	lnx8	D	C
coefficient	0.21	0.24	-1.76	0.00	0.25	1.09	0.06	-0.23	-0.04	-0.71
T value	0.64	1.81	-7.91	-0.03	3.97	6.18	0.47	-0.79	-8.87	-0.44
Prob value	0.55	0.13	0.00	0.98	0.01	0.00	0.66	0.46	0.00	0.68
VIF value	1163.81	81.18	234.61	673.96	3187.60	102.71	2237.19	170.09	5.48	NA

With given significance level  $\alpha=0.05$ , the critical value for  $n-2=13$ ,  $t_{(0.025)} = 2.16$ .

The regression results show high multicollinearity between variables (VIF value > 10). Therefore, stepwise regression was performed for the original explanatory

variables considering the t values of various explanatory variables and the values of VIF in between, obtaining the following regression results: Therefore, the original explanatory variable was gradually regressed by

combining the t value of each explanatory variable and the VIF value of variance inflation factor, and the regression results after excluding multicollinearity were as follows (Table 3):

**Table 3: Regression results**

Variable	lnx2	lnx6	lnx8	C
Coefficient	0.48	2.92	5.66	-0.21
T value	4.28	10.75	28.37	-0.07
Prob value	0.00	0.00	0.00	0.94
VIF value	2.35	1.51	2.88	NA

$$\ln Y_t = -0.211 + 0.484 \ln X_{2t} + 2.921 \ln X_{6t} + 5.657 \ln X_{8t}$$

The ARCH test Obs\* r-squared =2.253519, the corresponding P value =0.1333, greater than the given significance level alpha =0.05, which does not reject the null hypothesis that there is no heteroscedasticity .In terms of autocorrelation, DW value =1.38 can be used to preliminarily judge the existence of a certain degree of autocorrelation, and LM test is used to judge the Obs\* r-squared =12.96464 with a lag of 1 order, and the corresponding P value =0.0015. The null hypothesis is rejected

at the significance level of 5%, that is, the disturbance term has a first-order autocorrelation. After calculating the auto-correlation coefficient p =0.312, the generalized difference transformation is carried out on the model:

$$\ln Y_t - 0.312 \ln Y_{t-1} = -6.932 + 0.951(\ln X_{2t} - 0.312 \ln X_{2t-1}) + 3.357(\ln X_{6t} - 0.312 \ln X_{6t-1}) + 4.154(\ln X_{8t} - 0.312 \ln X_{8t-1}) + \epsilon_t$$

**The Final Model Regression Results**

$$\ln Y_t = -10.076 + 0.951 \ln X_{2t} + 3.357 \ln X_{6t} + 4.154 \ln X_{8t}$$

**Table 4: ADF unit root test results**

	t-Statistic	Prob	Result
lny	-6.780102	0.0001	stationary***
Δlny	-2.274540	0.1948	NonStationary
Δ²lny	-7.707365	0.0001	stationary***
lnx2	1.727812	0.9727	NonStationary
Δlnx2	-2.636195	0.0128	stationary**
Δ²lnx2	-4.539518	0.0003	Stationary***
lnx6	-7.120873	0.0001	stationary***
Δlnx6	-3.184564	0.0469	Stationary**
Δ²lnx6	-3.637703	0.0241	stationary**
lnx8	-0.770051	0.7963	NonStationary
Δlnx8	-3.916667	0.0128	stationary**
Δ²lnx8	-5.573248	0.0014	Stationary***

Notes: \* denotes “stationary” at significance level of 10%, \*\* “stationary” at significance level of 5%, and \*\*\* denotes “stationary” at significance level of 1%.

According to the ADF unit root test in table 4, the above variables are all second-order single integration sequences, and the co-integration test can be carried out.

Through the Johansen co-integration relationship test, it is concluded that there are at least four co-integration relations at the significance level of 5%, while the

engle-granger co-integration test also does not reject the null hypothesis that co-integration relations exist. Therefore, it can be concluded that the previous regression results are valid and not pseudo-regression.

## Conclusions

According to the results of empirical analysis, the factors that have a significant impact on the educational development of international students in China after entering the 21st century are academic level and international recognition of universities, international tourism industry and government's education expenditure, which show a positive impact.

It can also be seen from the regression coefficient that the country's support for education development has the most significant positive effect on improving the degree education scale of overseas students. However, the number of higher education institutions, exchange rate, the popularity of domestic higher education, the number of overseas education agencies, the development of international aviation industry and the introduction of important relevant policies and social events do not have significant impact thereon.

Previous studies have suggested that the investment and expenditure of education funds are the most important factors affecting the number of overseas students in China [19], and Jin [15] further added that the opening of Confucius institutes and the openness of service trade also have positive effects. Our results of empirical analysis not only verify the previous studies, but also find out that the improvement of universities' own level and popularity and the development of international tourism also play a crucial role in promoting the export of China's higher education.

Our empirical result is a supplement and improvement to the research on export competitiveness of international education service trade. As for the three main influencing factors in the empirical results,

our interpretation is as follows: Firstly, what is mostly needed for the higher education institutions of a country to attract international students is to be "strong enough to forge iron".

International students would choose to study in a country only if the level of higher education in this country is sufficiently high, the international students studying in this country can achieve the academic goals, and the academic degrees obtained are sufficient to be recognized by their home countries and even by other countries in the world.

Otherwise, students are more likely to receive higher education closer to home. Secondly, the number of overseas tourists traveling to China has positive impact on the internationalization of China's higher education, which coincides with the old saying, which goes "it is better to see once than to hear a hundred times".

In recent years, with the development of China's tourism industry, a large number of overseas tourists have been attracted to China, which allows more foreigners to understand China closely, and to a certain extent, decide to study in China or advise their relatives and friends to study in China. Finally, it is not to be doubted that the input of educational expenditure has positive impact on the scale of international education. Education, the pillar of a country, can flourish only when it is led and supported by the state.

Only by increasing the investment into education can China gain more outputs from education, more achievements be made from more research subjects, more project achievements be put into practical use, and the level of China's higher education be improved steadily to attract more international students to choose China as the destination for study abroad. The export of education services is an important part of a country's export trade. Currently, five developed countries-the United States,

Britain, Australia, France and Japan-account for nearly 80% of the trade share in education service market, among which the United States and Britain account for nearly 60%. Although China became the world's third largest country receiving international students and accounted for 8% of the international student market [14], its education services export volume accounted for only 0.65% of the world's total education services export volume [20].

China's education services export volume is extremely inconsistent with its huge higher education scale. Therefore the key problem lies before the export of China education services in near future is how to convert the scale of international students to its national economic benefit, reduce and even reverse the great deficit of education services

import/export trade, and thus promote the healthy development of international education industry.

### Acknowledgement

This paper is sponsored by the Project of "A Comparative Study of Higher Education Internationalization in Germany and China"(Project No.: ZDF1403), from Sichuan Agricultural University's Germany-Focused Research Center, the Region and Nation Key Research Base of Sichuan Province; also sponsored by National and regional research projects of Ministry of Education 2017. YE Yankun (1993-), male, from Nanjing, Jiangsu Province, postgraduate, College of Economics, Sichuan Agricultural University. Research direction: International Education Industry and Economic development.

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