Quantitative Analysis on Economic and Financial Factors behind International Students Tourism (Study Destination Choice): Evidence of China

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Abstract
Using time series data, variables were stationary at first difference, both at 5% and 10% critical value. AIC selection order criteria were used to determine the lag length “one”. Results from the co-integration test prove the existence of a long run relationship between the variables. Scholarship funding, exchange rate and CPI have a positive impact on international students. The Belt and Road initiative have shown to not yield a positive impact on international students yet. The family student paying ability shows that, due to the affordability of tuition in China, families in countries like the USA and S. Korea, have a higher possibility to send students, study in China, which might be one of the reasons why there is a greater number of students from S. Korea and the USA. It is important, however, for China to restructure its employment policies regarding foreigners, as it goes a long way in attracting international students. For further studies, the paper would recommend the use of panel data and or use other econometrics models like the AR model.

Keywords: Co-integration; Causality; Economic policies and reforms; Paying ability and international student's tourism

Introduction
Shirk pointed out that, with China deciding to open up its doors to the world in 1979, to allow for foreign trade and investment. Such a new normal allowed for a change in economic policies and reforms, one of which paved way for internationalisation the education system. From then, China have become a bigger player in international student’s tourism sector, surpassing Malaysia and South Korean. However, currently its nearest rival is Japan which have more students and it is China’s huge plan of becoming an Asian leader in attracting international students. As such the communist government under its Ministry of Education have made proposal to reach half a million international students by 2020. Henceforth, it is to this paper to analyse the economic factors which have made China a lucrative study destination since 1999 and see to it if China has to do more on-top of what’s its offering on its international student’s package. The paper will base its analysis, by employing time series data on the Co-integration test and the causality test. At the same time give a descriptive overview on the type of data being used for analysis.

Background
With most papers having to concentrate on the qualitative analysis on motivational factors behind international students study destination choice. This paper will introduce quantitative aspect on the factors behind an increasing number in international student’s mobility, evidence of China. According to the British council, over the past two decades there has been over 4 million globally international students in mobile seeking for tertiary education. The number is expected to increase as this comes as a form of internationalisation initiative for different countries. Thus, globalisation has created a new normal in the way the world of education is being viewed, in the sense that before, it was just a system meant to strengthen a country’s production capability and a way to uphold “decency” amongst people, however, with recent development, it is now more of a tool which can be used to integrate a country with the outside world and also a form of economic sector a country can benefit from. Henceforth, just like economic, political and cultural environment, education was not immune to internationalisation. As such countries have started opening up to international students giving rise to the “student’s tourism” sector, through an increase in higher education mobility, Bayam and Kashkinbayeva [1], Antiti [2], China, like most economies, is also trying to tap into the benefits which comes with international student’s tourism [3], with China joining the Word Trade Organisation (WTO), and implementing different economic reforms and opening-up-policies, in 1978. China has witnessed a great change in its education system, Ministry of Education of China [4]. Resulting in China attracting a great number of international students from across the world with every continent being represented. According to the MOEC, there has been an increase in international students by about 20% since 2016 (thus 10% in 2017 and 10% in 2018 as well) with a greater number opting to study either a PhD or a master’s program [4]. Currently in Asia, Japan holds the greatest number of international students, followed by China (Mainland), Malaysia, South Korea and Hong Kong.

This study will focus on China and will look at different economic and non-economic factors behind an increasing in number of international students flocking to China. Figure 1 showing where most students in China are coming from;

Asia constitute the highest number of international students with a share of about 81.93% followed by Europe with 8.31%, America constituting 6.05%, Africa accounting for 2.31 and Oceania with about 1.04%. By country South Korea, Japan, Russia, the United States, Ghana, Nepal, German, Pakistan, Vietnam, Mongolia and Indonesia, have the highest number of students in China. For countries such as

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Russia, South Korea, Japan and Mongolia, proximity of origin country and affordability paces a major role. However in general, China has been fruitful in upholding political and social stability, coupled with sky rocketing economic growth, which have been major contributing factors to a rise in international students flocking in.

Research question

- To determine and analyse the dynamic causal factors that lead the Chinese education system to its status quo.
- Does paying ability affect decision making process on study destination choice?
- Can China be able to meet its plans that of having half a million international students.
- The reasons why China is pressing to have more students by 2020.

Motivation

The paper aims to raise awareness on factors which are associated with international student’s tourism. Also the paper will contribute to a general understanding on the interest that lead students to apply for courses in China. Be able to quantify the impact of economic factors on China as a better study destination.

Literature Review

Eder et al. [5] categorised the factors in study abroad destination choice into three factors which are the push factors (personal growth, career and language), pull factors consisting of reputation of the college, culture and physical geography, and the structural factors which act as a constraint, (tight visa application process and financial issues). An explanation from, states that pull factors relate to those factors that motivate a student to have a desire to move abroad, whilst push are the factors that make the students want to leave home.

Presented a theoretical model to explain the influential factors behind international students decision making on the choice of study destination by integrating explanatory factors according to groups [6]. For instance, the paper stated that the purchase intention which is the pull factor to go and study abroad is a function of personal reasons (advice and personal improvements), country image effect (culture and social effect), city effect (environment, city image and cost of living), programme evaluation (program recognition, program security and cost of the program) and a group consisting of institutional image (quality of professors, communication and Facility on campus). Cubillo et al. [6] concluded that, there is need to examine the relationship of the aforementioned factors, in terms of their weight and importance towards decision making. These are more of country choice factors.

Zhang and Dai [7], and Chong Pui [8], however, focused on both country factors and also institutional factors. According to their paper, country factors comprised of the general average cost of tuition, how safe is the country, culture and lifestyle, institution academic reputation and how competitive is the country compared to other countries, and these were deemed to be the most influential factors. In terms of the institutional factors, their paper focused on the University of Malaya in Malaysia, and they revealed that, students consider the quality of the degree, how recognised is the degree and cost of tuition as the main drivers. All in all, the tuition cost and reputation are the most influential factors, Zhang and Dai [7], Antti [2] and Phang [9], also pointed out that tuition fee greatly influence a student’s study destination. Phang [9], using data collected from a semi-structured interview, further mentioned that quality of communication, social factors (such as students testimonies, and former professor), and location comprised of language, costs, institution image, and international environment, are some of the push and pull factors behind the choice of study destination, (see also Ozoglu et al. and Bhati et al. [10,11]. Using a qualitative approach, Bhati et al. [11], came to a conclusion that a firm Australian dollar, tight student’s visa application process, an increase in the cost of living, and safety and security are the main factors that attracts most Indian students to study at an Australian University which have campuses in Malaysia than studying in the Australia country. Furthermore, Roga et al. [12], stipulated that, results from a qualitative and quantitative analysis show that 55% of the respondents opt for academic quality, 42% academic reputation. Cost of living, proximity of the country of origin also influence student’s choice. Of the factors deemed as irrelevant they include 30% on sports reputation, 34% of location in the EU, parents and friends suggestion 21%. Figure 2 shows factors of importance when choosing an HEI.

Using a model based on expectancy theory Sanchez et al. [13], revealed that they are different motivational and barriers to students intention on study abroad decision making. As such due to difference in nationality these factors will vary. Sanchez et al. [13], goes on to state that, motivational factors incorporate student’s new experience, willingness to learn other languages, search for liberty and or pleasure, and the desire to improve their social situation. Barriers consist of family pressures, financial situation, social and psychological factors. Results are similar on all the sample they used. However a sample consisting of Chinese students showed that Chinese hold the same factors of family dependency and this might be because of the Confucianism, were the family plays the central role in a student’s life, Sanchez et al. [13].

Ozoglu et al. and Bhati et al. [10,11], mentioned that geographical proximity, religious, historical, ethnicity infinities, quality of education, scholarship opportunities and affordability factors, are of paramount importance in making study destination choices. Also internationalisation of the education system by implementing different structural executive and legislative arrangement have been the contributing factors to Turkey tertiary education charm on international students.

Methodology

Unit root (ADF), Co-integration and Causality.

ADF Stationary test

$$\Delta pt = \alpha_0 + \alpha_1 pt-1 + \Sigma \alpha \Delta pt + \mu t n i = 1$$

1

Figure 1: Different economic and non-economic factors behind an increasing in number of international students flocking to China.
Regression Model

From Table 1 \( \ln \theta_t = a_1 + a_2 \ln \eta_t + a_3 \ln \rho_t + a_4 \ln \phi_t + a_5 \ln \gamma_t + a_6 \delta_t + \mu \) \( \sim (0, \sigma^2) \) (2)

Co-integration

The test will be done with variable under first differencing.

\( \ln \theta_t = a_1 + a_2 \ln \eta_t + a_3 \ln \rho_t + a_4 \ln \phi_t + a_5 \ln \gamma_t + a_6 \delta_t + \mu \) (3)

Hypothesis:

\( H_0: \delta_1 \eta = \delta_2 \gamma = 0 \) (no co-integration)

\( H_1: \delta_1 \eta \neq \delta_2 \gamma \neq 0 \) (with co-integration)

Denoted by \( F(0/x) \) with \( x \) representing all the regressor variables.

Granger causality test

\( \theta_t = \beta_0 + \sum \theta_0 \theta_{t-1} + \sum \theta_1 \theta_{t-1} - 1c_i = 1ci = 1 + \mu_1 \) \( t \)

\( x_t = \mu_0 + \sum \theta_0 x_{t-1} + \sum \theta_1 x_{t-1} - 1c_i = 1ci = 1 + \mu_2 \) \( t \)

With the following null hypothesis;

\( H_0: \theta \) does not "Granger" cause \( x \) \( H_1: \theta \) does "Granger" cause \( x \)

\( H_0: \theta \) does not Granger cause \( \theta \) \( H_1: \theta \) does not Granger cause \( \theta \)

Proxy \( xt \) consist of all regressor variables, and \( \theta_t \) representing the dependent variable.

Students paying ability model

Student paying ability model adopted from Wan [14] is given as follows;

\( y = \pi \sum \alpha_i = 0 \phi + \pi \sum (\theta - \gamma) \alpha_i = 1 \) (6)

Where family of students paying ability for tertiary education \( y \), number of family members \( n \), years of study program \( \phi \), average family per capita saving \( 2 \), the annual per capita income \( \theta \), per capita balance of savings deposit \( r \), Wan [14].

Results

The yearly data used, stretches from 1999 to 2018, accessed from the PRC Ministry of Education and PRC Ministry of Foreign Affairs and the bureau of statistics of China [15]. The paper adopted the time series data and the following results were revealed;

Descriptive statistics

Before we get into much detail, it is important to first have an appreciation of the type of data the paper will use, its qualities and properties shown on Table 2.

The total observation being 19 for all variables, with international students (IntS) and GDP per Capita having the highest range and standard deviation. Scholarship funding have the lowest mean than the exchange rate variable. Funds represent total scholarship by the government, and exch--exchange rate.
The number of international students coming to China, increase by an approximately 0.99 points. However, the reality is a weaker Yuan against other currencies is even more advantageous. Meaning other currencies will have a stronger purchasing power parity to Yuan, meaning, affordable. As such, it would be safe to state that the number of international students cannot cause movements GDP per capita, but it would be immature and irrational to state that of no co-integration. As such, it shows that all variables are factors that contribute to its economy, for instance, from the granger causality we can see linearity. There is however, a co-movement between international students and CPI, but it would be immature and irrational to state that the number of international students coming to China, increase by an approximately 0.99 points. Unfortunately, between the period 2003 and 2006 the Yuan remained stationary at first difference at either 5% (*) and or 10% (**) significant level. Results are shown on Table 3.

**Unit root test**

Using the ADF test, with lag selection of (1) from the AIC, the paper tested unit root. With the assumption of trend, the variables were stationary at first difference at either 5% (*) and or 10% (**) significant level. Results are shown on Table 3.

**Regression**

With a 95% confidence interval of [0.9999; 1.0000], scholarship variable show that it is the most effective tool in attracting students. That is there is a direct positive correlation between a percentage increase in scholarship funding and the number of international student coming to China. An increase in CPI partially increase the number of international students coming to China by approximately 0.0000558 points. An increase in GDP per capita negatively impact the number of international students coming to China by approximately 0.0000137 points. Stability of the exchange rate plays a greater role in attracting international students to China. However, the reality is a weaker Yuan against other currencies is even more advantageous. Meaning other currencies will have a stronger purchasing power parity to Yuan, meaning, affordable cost of living. For instance, according to the results, with all things being equal, as the Yuan depreciates against the US dollar, the number of students coming to china, increase by an approximately 0.99 points. Unfortunately, between the period 2003 and 2006 the Yuan remained stable and appreciated between the periods 2007 to 2009 period of financial crises, then partially fluctuated with an annual average of 6.5 against the US dollar, between 2014 and 2017 [16]. Although the B and R initiative results shows a negative impact on international students variable, in reality however, however, the Belt and Road initiative, have proven to be one of the main variable leading to an increased number of international students to China. Thus, with the initiative, China has signed memorandum of understanding with the involved country, involving study funding from China, and easy visa application process. Also with China’s business expansion into new territories either along the Belt road or not, students with Chinese degrees are the most preferred either by the Chinese firms and or not.

However all the variables, except B and R and GDP per Capita, are statistically significant at 5% significant level. With a Chi-Square value of 0.00 and a P-value of 0.9845, the Breusch-Pagan/Cook-Weisberg test for heteroskedasticity shows that all variables fitted values of our dependent variables as well as the model.

**Co-integration test**

As shown above, the ADF test Table 4, is to show the co-integration between variables. Thus, with all variables stationary at first difference, the ADF test revealed that all variables are co-integrated at both 1% and 5% significant level, hence the paper rejected the null hypothesis that of no co-integration. As such, it shows that all variables are factors that students as well as the host country (China) have to consider.

China apart from its lucrative economy, its communist government have to be more open to international standards in terms of their internationalisation process, thus be of action, than talk. However with a stable currency, student who are not on scholarship are able to plan for their studies, without the fear of having to incur expenses because of a sudden changes in value of the Yuan. Other factor to be factored in has to at least talk about safety, language and cultural barriers, as these based on other studies are of paramount important [10,11].

**Granger causality**

From Table 5, reveals that all repressor variables can actually cause/explain changes in international students coming to China, except for exchange rate which was dropped from the equation to avoid co-linearity. There is however, a co-movement between international students and CPI, but it would be immature and irrational to state that international students can explain the CPI changes, as the first, looking at China’s economic size (CPI), can be hold as insignificant against the later. Henceforth, the need to have half a million international students by 2020, is not because of economic benefits, or at least directly related to its economy, for instance, from the granger causality we can see that international students cannot cause movements GDP per capita, CPI and B and R. As such it would be safe to state that the number of
international student’s variable is statistically insignificant to explain the major economic changes in China. As such, having more international students or investing more in student’s tourism for China can at least be an indirect approach to its economical stunts. Can be something which have to do with image building, a way of showing its dominance and what it can archive, and or way to add its rich culture. Can also be a way of creating awareness and exposure to local Chinese, so that they can benefit from the presence of foreigners without having to move out of the countries? Above all, China is currently penetrating all parts of the world which can be shown by a great variety of international students in China, and one thing for sure it is good for business from Chinese [17].

Family students paying ability

Students paying ability is another important factor that students consider when making study destination decision. Thus, financial constraints, greatly have a negative impact on the concept of student tourism. A lot of students are willing to move abroad, but are limited by financial constraints. Below is a Table 6 comparing tuition fees between countries with China?

It is important to note that, the above tuition Figures 1 and 2 are an estimation of an average yearly amount. The paper used the US exchange Figures 1 and 2 from Fred bank dated 26/12/2018. The data ranges from different sources, including, the Ministry of Education of the above countries, www.timeshighereducation.com and www.masterportal.com. The Table 6 reveals that, it is financially viable for international students from Zimbabwe, South Africa and S. Korea to study in China for their bachelors program, than to the US and the UK. However, Portugal have lesser fees than China, making it more attractive than China. For a masters and a PhD program students are better off to study in S. Korea, Japan, South Africa, and Zimbabwe. However, China have an advantage that of a lower CPI compared to most of its rivals, Malaysia and Japan and other countries like Zimbabwe and South Africa. Table 7 below shows Figures 1 and 2 to calculate family of student paying ability;

The above are 2016 annual Figures 1 and 2 from the US Federal Reserve and Ministry of Finance of S. Korea. According to the MOE of PRC bachelors programs takes around 4 years to complete an average of 2.5 years for master’s program and 4 years for a PhD program [18]. According to the student ability model, results show that families in both the US and S. Korea have a paying ability of $113127.68 and $64174.8, respectively for 4 year program. Making it possible for families in such countries to have enough disposable income after paying for tuition fee in China, assuming they have students in China [19,20].

Discussion

With the aim of having half a million international students by 2020, China has to do more-than having a lucrative economy. To start with, she has to deal with her employment policy, which is act as one of the major reason that attract international students, she can learn from the US, Australia, and the UK, and New Zealand which recently eased its student policy on employment. Currently, working at least on a part time basis during study periods is strictly prohibited and even after graduating, getting employment is still a challenge, worse off getting a green card. On a better note compared to Australia, US and the UK, China like most countries competing for international students, China has ease its visa application process. The Belt and Road initiatives have made it easy and more flexible for students along the line to access scholarships and the country since 2006 has increased its government scholarship funding by more than 250 percent, making it a more attractive study destination. On another note as with many West Asian countries, China has managed to maintain peace and stability which act as another contributing factor to an increased number in student tourism. With the exception of other provinces which experience serious natural disasters, (Qinghai and Sichuan provinces, Tibet autonomous region; although a great number of students are recorded to be studying in north and north eastern area of China, Safety is one of the major concern which have made countries in the southern part and the middle eastern part of Asia be less attractive.

With an increasing GDP per capita which is currently about US $8500, and a higher GDP of 6.3 percent per year, most students are preferring China than the US and other European countries, especially students from Russian, Africa and other East Asian nations, who see China as the new US. China economic dominance has allowed it, to increase the number of its trading partners, making it more attractive to have a Chinese degree, hence a competitive tertiary education system. Its economic reforms, and policies which are raw in nature (hence the need for China to do economic policies/reform experiments on a certain economic region and monitor their success and if they are successful then the same reforms would be implemented on a national level using studied strategies) and how it has managed to have triple economic growth rate than most European countries and having its currency in the baskets of currencies within a period of four decades, make her more attractive for study destination as students would want to get a first-hand grip on the knowledge behind its exploding economy. One thing which cannot be ignored is its steady exchange rate, the communist government has relentless put effort in making sure its currency stays afloat and against the US, dropping from an average of 8.159 over the past 9 years (1999 to 2007) to an average

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**Table 5:** Granger Causality.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Variable</th>
<th>chi²</th>
<th>Df</th>
<th>Prob &gt; chi²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Int-Students</td>
<td>CPI</td>
<td>3.003</td>
<td>1</td>
<td>0.083</td>
</tr>
<tr>
<td>CPI</td>
<td>Int-Students</td>
<td>8.123</td>
<td>1</td>
<td>0.004</td>
</tr>
<tr>
<td>Int-Students</td>
<td>GDP/capita</td>
<td>0.446</td>
<td>1</td>
<td>0.501</td>
</tr>
<tr>
<td>GDP/capita</td>
<td>Int-Students</td>
<td>6.708</td>
<td>1</td>
<td>0.101</td>
</tr>
<tr>
<td>Int-Students</td>
<td>Scholarship Funds</td>
<td>0.464</td>
<td>1</td>
<td>0.496</td>
</tr>
<tr>
<td>Scholarship Funds</td>
<td>Int-Students</td>
<td>8.326</td>
<td>1</td>
<td>0.004</td>
</tr>
<tr>
<td>Int-Students</td>
<td>B&amp;R</td>
<td>0.822</td>
<td>1</td>
<td>0.774</td>
</tr>
<tr>
<td>B&amp;R</td>
<td>Int-Students</td>
<td>0.538</td>
<td>1</td>
<td>0.463</td>
</tr>
</tbody>
</table>

**Table 6:** comparing tuition fees between countries with China?

<table>
<thead>
<tr>
<th>Bachelor's Degree</th>
<th>Master's Degree</th>
<th>PhD Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>$1500*</td>
<td>$6500*</td>
</tr>
<tr>
<td>Portugal</td>
<td>$1260*</td>
<td>$1570*</td>
</tr>
<tr>
<td>USA</td>
<td>$20000**</td>
<td>$33000**</td>
</tr>
<tr>
<td>South Africa</td>
<td>$2500**</td>
<td>$5000**</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>$2000**</td>
<td>$5000**</td>
</tr>
<tr>
<td>South Korea</td>
<td>$2500**</td>
<td>$5400**</td>
</tr>
<tr>
<td>Japan</td>
<td>$4265*</td>
<td>$6271*</td>
</tr>
<tr>
<td>UK</td>
<td>$11917*</td>
<td>$11603*</td>
</tr>
</tbody>
</table>

*Public institutions

**Table 7:** Family of student paying ability.

<table>
<thead>
<tr>
<th>South Korea</th>
<th>Net Amount</th>
<th>USA</th>
<th>Net Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per capita balance of saving</td>
<td>$257</td>
<td>Per capita balance of saving</td>
<td>$452.44</td>
</tr>
<tr>
<td>Family savings</td>
<td>$28,380</td>
<td>Per family savings</td>
<td>$30,600</td>
</tr>
<tr>
<td>Per capita income</td>
<td>$14,554</td>
<td>Per capita income</td>
<td>$33,205</td>
</tr>
<tr>
<td>Family members</td>
<td>3</td>
<td>Family member</td>
<td>2.8</td>
</tr>
</tbody>
</table>
of 6.5597 over the past 11 till 2017 and 2018 ending at an average of approximately 6.673 against the US dollar to the advantage of students, a steady exchange rate make it easy for students to budget for their tuition without the fear of exchange rate risk and with the aid of a lower CPI makes it more affordable for international students. For instance comparing with a country like Zimbabwe between the 2006-2008 period and Germany between 1922 and 1923, such a period would be characterised by shortage of basic commodities, currency shortages, unstable tuition fee and a lesser competitive tertiary education system. On contrary a weaker currency is more attractive for international students as they will have a stronger purchasing power, for instance students from most European countries using the Euro and from the USA and South Africa find China a heaven on earth they have a stronger purchasing power.

However, it takes more than an attractive economy to attract international students, for instance, Australia, the UK and Switzerland have a demanding visa application process, a toughest enrolment making it difficult for students to settle and get used to her customs. Just like most communist states (North Korea, Cuba, Lao etc) have strict policies when it comes to their internal affairs making it difficult for international students from such countries as USA most European countries, most Southern African states and other parts of Asia to live without fear of the state. Above all the factors scholarship funding is the most attracting variable, thus apart from the Chinese Government Scholarship (CSC), they are other scholarship either between countries or the country and or continent targeting scholarships, such as the Asian students scholarship, China Development Bank scholarship, China and some of the European government scholarships and also excellence based scholarship which have help to add on the number of international students coming to China. The same strategy have worked for countries like Malaysia (Malaysian scholarship targeting most developing nations), the UK, USA and Australia (both having a variety of scholarships), Turkey (Turkey Government Scholarship) and German (DAAD scholarship).

Conclusion

The paper has safely stated that, the need to have half a million students by 2020, can be indirectly related to reasons. However, how the communist state have given life to its economy over 40 years has been one of the main reasons why international students are flocking to China from all over the world. However, China need more than a lucrative economy to lure more international students. For starters, China has to improve on its employment policy. The paper with no doubt it is possible for China to have half a million by 2020, with the help of its B and R initiative and scholarship strategies mainly.

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