

Exploring the Determinants of International Students' Mobility Destination from macro-level

Zhe Li*

Institute of Education, the University of Manchester, Manchester, Britain

* Corresponding Author Email: 200174@yzpc.edu.cn

Abstract. With regard to economic recession and intense resource distribution in the post-pandemic period, nationalism appears and more restrictions for international students' mobility (ISM) are carried out. However, the education is marketized and abundant universities regard international students' financial support. Thus, the research aims to investigate the macro-level factors of international students choosing destination countries and the factors' significance. The research adopts theory framework of PESTLE to identify the determinants. And it applies several international organizations' statistics, OECD, World Bank Group, etc., in the last five years. The statistics are analyzed through descriptive analysis, Spearman correlation, multiple linear regression and a regression model is constructed. The unexpected results indicate that tuition fees and crime rates facilitate ISM development, while GDP is negatively related to ISM. Corresponding conclusions are drawn that prestigious universities located in cosmopolitan cities with high crime rates still attract international students. Also, those universities dominate the decision of high tuition fees for their educational reputation. Meanwhile, international students with deficit academic skills and socioeconomic status have to make a compromise when choosing the destination countries.

Keywords: International Students Mobility, Spearman Correlation, Multiple Linear Regression.

1. Introduction

1.1. Background

Concerning the economic crisis that has prevalent impacts on the global economy, education regarded as one of the crucial public resources has been marketized especially in the tertiary section. Specifically, education used to be sponsored by the governments, while the authorities now reduced the educational budgets leading to the need to recruit a large number of international students, especially in countries aiming to export education [1, 2]. Presently, Britain, the United States, Canada, Australia, etc. try to attract international students because the students are regarded as primary source of discretionary revenue [3]. Meanwhile, students also recognize international education as a means for cultural reproduction and are keen on paying the bills. Thus, since the 21st century, the range of the international students has been witnessed a boost mainly in those countries which have better education resources, prosperous economies, open immigration policies and stable social environments. However, it has been noted that with unstable global situations, the flow of international students is actively fluctuating to date.

As the increasingly intense geopolitical conflicts and the deteriorating ecological environment, international student mobility (ISM) is impacted accordingly. The economic recession and travel restrictions caused by Covid-19 have allowed anti-globalization, nationalism and protectionism to take the place of mainstream opinions [4]. Those people argue that under the intense resource competition in society, the government ought to apply more restrictions on international mobility to ensure the welfare of the citizens [5]. Also, deteriorating relationships among some countries have led to massive conflicts and restrictions in academics, such as Sino-American relations and Russian-Ukrainian relations [6, 7].

1.2. Problems and Research Motivation

Abundant research has focused on determinants of international students' mobility usually from the micro-level. By investigating the students' perspectives through questionnaires, studies reveal the international mobility factors from students' perspectives [8-10]. However, the results may contain subjective errors and represent regional factors. Furthermore, after the pandemic virus, despite the fluctuation of international mobility, a few studies focus on this field probably because of deficit data. Hence, investigating ISM from the macro level seems necessary.

The statistics of recent years are not fully released by the international organizations. Usually, a framework, so-called PESTLE, is exploited to identify general risks or opportunities which may affect the outcomes of future strategic planning in a highly competitive market. PESTLE, which is derived from PEST representing Political, Economic, Social, and Technological factors, adds Legal, and Environmental factors [11]. It is claimed that the framework can thoroughly analyze all possible driving factors of ISM. Conversely, because of the pandemic virus and its prevalent influences, some updated data are not available from the official websites.

1.3. Research Aims and Objectives

This research aims to identify the determinants of international student mobility through the macro level and to determine each dimension's significance. Specifically, the objectives are 1) to explore the determinants of destinations of ISM based on the available statistics of economy, costs of education, security issues, education reputation, etc., 2) to identify the significance of ISM determinations about choosing the destination, 3) to forecast the trend of ISM.

1.4. Research Questions

Therefore, the following research questions will be addressed,

- 1) What are the determinants of ISM?
- 2) Which determinants are the most significant regarding ISM?
- 3) Where will be the destinations of ISM in the future?

2. Literature Review

2.1. International Students Mobility (ISM)

Between 2018 and 2021, annual numbers of inbound international students increased from 5.3 million to 6.4 million according to the Institute of International Education. This field is rather complex for it does not only involve millions of mobile people, but also it relates to various dimensions, like police, economy, education, etc. [12]. Usually, the ISM is analyzed under the theoretical framework of push-pull model and Bourdieusian capital theory [13]. Human capital is what most scholars focus on and it underlines the planned return from education and migration which enhances their competitive positioning in the labour market and career and provides tangible economic effects [8]. Opposite views exist that mobility does not necessarily guarantee students' employment and salary [13]. To ensure the advantages of the class, cultural capital reproduction is also mentioned [5]. However, the motivation of students selecting destination countries is more than just capital and thus push-pull model is going to be adopted [14].

The push-pull models are commonly applied to understand the forces shaping international students' decisions. The models represent the flow factors that students state dissatisfaction in various parts of their hometown while the pull factors are attractions generated by the host countries' education, cultures or economy [7]. The push factors are usually about deficit educational resources, political instability, unstable society, competitive employment market, etc., while pull factors can contain host countries' prosperous economy, rich educational resources, education reputations, employment opportunities, fancy cultures and so on [15]. Recently, the push-pull factors should be updated as the Covid-19 leading to an unstable society and travel restrictions [4]. Admittedly, the

models have been criticized for listing factors ambiguously while ignoring individual perspectives [16], but the models are still effective and suitable for analyzing determinants of ISM in this study.

2.2. ISM and Economy

With regard to economic status, it can be either push or pull factors. A disappointing economy is related to a competitive labour market and intense resource distribution. To ensure the stratification, an increase of ISM is witnessed [16]. The pull factor of the economy is about destination country's economy scale which can provide more financial support and secure employment opportunities during and after study [15]. Noticeably, international students' tuition fees also contribute to a large amount of GDP in destination country. And usually, Gross domestic product (GDP) per capita is regarded as the data manifesting the regional economy. Because GDP can accurately anticipate the long-term prosperity of a country and ensure the rich resource of education.

2.3. ISM and Costs

The costs of tuition fees and living are usually mentioned in the literature, but the relationships between costs and ISM vary. With the increasing costs in UK, the number of international students from Europe decreased [3]. However, it seems that some universities highly depend on international students fees as support for deficit budget [4, 9]. And some less prestigious universities may spend to help students get to the destination during the pandemic. Additionally, costs can be a pull factor, some countries with relevant lower educational costs and generous scholarships can attract international students from the middle class [18]. Additionally, costs can also affect ISM, as more prestigious universities can attract international students regardless of high expenditure [3]. And some students concentrate on gaining self-growth and unique experiences while expense [17].

2.4. ISM and the Security Issues

Regional security issues mainly play the role of pull factors. In the period of post-pandemic and political instability, students and their parents may consider the safety issues of the destination countries. A more secure society could allow universities to attract more international students. Enhancing national security and reducing political conflicts are recommended to promote academic alliances in the Middle East [6, 7]. Additionally, because of the conventional and cautious attitudes toward COVID-19, whether international students from China feel safe matters a lot concerning their study plans [4]. In addition, the crime rate is taken into account by international students and is an appropriate term to evaluate the "perception of insecurity" perceived by international students [18, 19].

2.5. ISM and the Education Reputation

The final potential indicator of the ISM is the educational reputation, but it may not be that significant to some extent. As a pull factor, education reputation is one of the most important measures for students when ranking prestigious universities [14, 17]. The university's reputation signals higher-quality instruction and more academic support [10, 14]. With fame, universities do not have to apply market strategies to attract students for students are willing to keep accommodating higher prices in return for perceived quality [20]. Meanwhile, students rely on the reputation of the universities which can be later converted to human capital back to hometown [13]. Regarding push factors, a dissatisfying education reputation may also cause an outflow of students [21]. And the reputation is claimed to be usually measured through the world university ranking system like Times Higher Education (THE) [14]. Contrarily, reputation alone may not have significant effects on ISM in particular situations [14]. And over-commercialized education can hinder prestigious universities' enrollment further reducing the qualitative students and damaging reputation [5]. Some even asserted a weak relationship between reputation and ISM [7].

3. Methodology

Since the research aims to investigate the relationships between ISM and economy, expenditures, security and reputation factors. The independent variables are the top 11 students' inbound countries' university ranking, university tuition fees, regional living costs, crime rates and GDP per capita, which have been commonly complied to measure the according factors [1, 15, 21]. While the dependent variables are inbound international students of the corresponding regions. The statistics are mainly extracted from the international organizations website. Specifically, the inflow students number is extracted from Project Atlas of the Institute of International Education [22], while the number of the world's top 200 universities in each country is from Times Higher Education, the average tuition fees are from each country's best university undergraduate official website, the costs of living are represented by consumer price index by World Bank Group, and crime rates are mainly from NUMBEO, GDP per capita are extracted from OECD.

The research mainly adopts three kinds of analysis, including descriptive analysis, correlation analysis, and regression to investigate the determinants and their significance. In the descriptive analysis, the research will mainly compare and contrast the change among the determinants of the top 11 inbound international students countries during the period of 2019-2023. Following the description, the research adopts Spearman Correlation to examine the relations of the determinants and ISM. Lastly, multiple linear regression (MLR) is utilised to determine the extent to which each factor influences the number of international students. Regression modeling can also help to identify which factors have the greatest impact on international students' choice of study destination. The analysis would give a complete and thorough insight into the factors of ISM.

MLR equation (1) is:

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \epsilon \quad (1)$$

And the interpretation of parameters in Multiple Linear Regression equation, Y: number of inflow international students; β_0 : intercept term; β_n : regression coefficient; X_1 : numbers of the universities in each country in top 200 ranking; X_2 : the best university bachelor degree annual tuition fees; X_3 : regional living costs; X_4 : regional crime rates; X_5 : GDP per capita; ϵ : error term.

4. Results

4.1. Descriptive Analysis

Table 1. Descriptive Statistics

	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
ISM	55	377344.31	264954.992	1.155	0.322	1.214	0.634
GDP	55	50597.24691	20613.07827	-1.153	0.322	0.999	0.634
CPI	55	84.83481995	213.2506557	-5.033	0.322	24.449	0.634
rank	55	14.78	16.472	1.730	0.322	2.321	0.634
fee	55	20180.46018	18765.89135	0.602	0.322	-1.317	0.634
crime	55	0.39085	0.092739	-0.822	0.322	-0.099	0.634
Valid N (listwise)	55						

The statistics are all found non-singularly distributed (Table 1). Among them, the consumer price index's (CPI) skewness is -5.033 which indicates that the data distribution is very significantly negatively skewed. While university rank numbers and inbound international students' numbers are positively skewed. There is no need for these data to be normally distributed because they are not randomly sampled. As for Kurtosis, the crime rate has a kurtosis of -0.099, which is close to 0, so the data is close to a positive distribution. On the contrary, the CPI kurtosis is 24.449, indicating an extremely spiky data distribution.

4.2. Spearman Correlation

Table 2. Spearman Correlation

			ISM	GDP	CPI	rank	fee	crime
Spearman's rho	ISM	Correlation Coefficient	1.000	0.247	0.313*	0.456**	0.730**	0.619**
		Sig. (2-tailed)		0.069	0.020	0.000	0.000	0.000
		N	55	55	55	55	55	55
	GDP	Correlation Coefficient	0.247	1.000	0.314*	0.638**	0.409**	0.300*
		Sig. (2-tailed)	0.069		0.020	0.000	0.002	0.026
		N	55	55	55	55	55	55
	CPI	Correlation Coefficient	0.313*	0.314*	1.000	0.281*	0.287*	0.245
		Sig. (2-tailed)	0.020	0.020		0.038	0.034	0.071
		N	55	55	55	55	55	55
	rank	Correlation Coefficient	0.456**	0.638**	0.281*	1.000	0.433**	0.225
		Sig. (2-tailed)	0.000	0.000	0.038		0.001	0.098
		N	55	55	55	55	55	55
	fee	Correlation Coefficient	0.730**	0.409**	0.287*	0.433**	1.000	0.482**
		Sig. (2-tailed)	0.000	0.002	0.034	0.001		0.000
		N	55	55	55	55	55	55
	crime	Correlation Coefficient	0.619**	0.300*	0.245	0.225	0.482**	1.000
		Sig. (2-tailed)	0.000	0.026	0.071	0.098	0.000	
		N	55	55	55	55	55	55

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

The Spearman correlation (Table 2) finds that all the determinants promote the rise of inbound international students' number. Among the determinants, the correlation coefficient of the tuition fee is the most significant which is 0.73, following the crime rate and the number of universities in the top 200 of THE ranking, 0.619 and 0.456 respectively. The relationships between ISM and GDP, CPI, are weak.

4.3. Multiple Linear Regression (MLR)

Table 3. Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	6.782	1.048		6.471	0.000	4.667	8.898
	CPI	-8.712E-05	0.002	-0.005	-0.047	0.962	-0.004	0.004
	rank	0.009	0.002	0.518	4.854	0.000	0.005	0.013
	crime	1.349	0.327	0.445	4.122	0.000	0.689	2.009
	Log (GDP)	-0.460	0.213	-0.226	-2.158	0.037	-0.891	-0.030
	log(fee)	0.062	0.039	0.161	1.587	0.120	-0.017	0.141

a. Dependent Variable: log (ISM)

Table 3 presents summary statistics of the regression model, specifically focusing on the coefficients and their significance. The table includes predicted values, residuals, standardized predicted values, and standardized residuals for a model with 48 observations. The mean predicted value is 5.5198, with a standard deviation of 0.23072. The residuals have a mean of zero and a standard deviation of 0.17644, indicating the differences between observed and predicted values.

Standardized predicted values and residuals also have means of zero, with standard deviations of one and 0.945, respectively, highlighting the model's fit and the relative magnitude of deviations.

Table 4. Residuals Statistics

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	5.0738	6.0185	5.5198	0.23072	48
Residual	-0.48397	0.28697	0.00000	0.17644	48
Std. Predicted Value	-1.933	2.162	0.000	1.000	48
Std. Residual	-2.593	1.538	0.000	0.945	48
a. Dependent Variable: log (ISM)					

According to the Unstandardized Coefficients B in Table 3, the regression equation can be generated as the equation (2):

$$Y = \beta_0 + 0.009X_1 + 0.062X_2 - 0.00008X_3 + 1.35X_4 - 0.46X_5 + \epsilon \quad (2)$$

All determinants, except CPI, have significant effects on ISM because their p-value is less than 0.05. Among the determinants, crime rates are found significantly and positively related to ISM, following tuition fee and university rank number. However, it is indicated that GDP has a negative relation with ISM in the Table 4.

The mean value of the residuals is 0, which indicates that the predicted values of the model do not deviate systematically from the actual values. The standard deviation of the residuals is 0.176, which indicates the margin of error of the predicted values. The standardized residuals range from -2.593 to 1.538, representing that the residuals are generally distributed within a reasonable range.

5. Conclusion

The results of the quantitative analysis are very interesting and opposite to the expectations of the study. Among the determinants, with crime rates significant rising, more international student inflow is witnessed in destination countries, following tuition fees. However, the relationship of GDP per capita and ISM is negative. That is, despite high crime rates, international students are still willing to study abroad, which seems contradict to the hypothesis. It should be noted that most prestigious universities are located in cosmopolitan cities where various social stratification exists leading to higher crime rates. As for costs, in spite of high expenditure in tuition fees, prestigious universities can still attract many international students with their fame in the field. Regarding weak and negative relations between GDP and ISM, it might be because those students who are not that outstanding and not from high socio-economic status families have to make a compromise when planning to study abroad by choosing countries with weak economic status.

The study gives a brand-new view of the motivation of ISM from the macro level after the pandemic of Covid-19 which deteriorated the marketization of education, economic recession and geopolitical tensions. There are two limitations. Since the usage of secondary data may not represent real situations, further study can find more relative data resources to examine the trustworthiness of the results. Additionally, to determine the true motivation of international students choosing the destination countries, further investigation through interviews and case studies should be carried out.

Reference

- [1] V. Naidoo, R. Roy, F. K. Rabbanee, and T. Wu, "Drivers of tuition fee setting practices for higher education institutions involved in international student recruitment," *Journal of Marketing for Higher Education*, 2022, doi: 10.1080/08841241.2022.2076274.
- [2] P. Bhat, R. Dwyer, H. Vally, and A. Pennay, "Acculturation and alcohol: Exploring experiences of alcohol for Asian international students in Australia," *International Journal of Intercultural Relations*, vol. 85, pp. 184–190, Nov. 2021, doi: 10.1016/j.ijintrel.2021.09.011.

- [3] A. Dias Lopes, J. L. Mateos-Gonzalez, and P. Wakeling, "How do tuition fee increases affect international mobility? The case of European Union students in England," *Eur J Educ*, vol. 59, no. 1, Mar. 2024, doi: 10.1111/ejed.12592.
- [4] K. H. Mok, W. Xiong, G. Ke, and J. O. W. Cheung, "Impact of COVID-19 pandemic on international higher education and student mobility: Student perspectives from mainland China and Hong Kong," *Int J Educ Res*, vol. 105, Jan. 2021, doi: 10.1016/j.ijer.2020.101718.
- [5] Q. Yang, J. Shen, and Y. Xu, "Changes in International Student Mobility amid the COVID-19 Pandemic and Response in the China Context," *Fudan Journal of the Humanities and Social Sciences*, vol. 15, no. 1, pp. 23–40, Mar. 2022, doi: 10.1007/s40647-021-00333-7.
- [6] S. Kaya-Kasikci and C. R. Glass, "Analyzing the influence of regional security on international student flows in the MENA region: a social network approach," *High Educ (Dordr)*, 2024, doi: 10.1007/s10734-024-01236-8.
- [7] H. A. Khan Eusafzai, "Educational capital and international mobility: A bourdieusian inquiry into choosing peripheral higher education destination," *Social Sciences and Humanities Open*, vol. 10, Jan. 2024, doi: 10.1016/j.ssaho.2024.100916.
- [8] A. Amendola and M. Restaino, "An evaluation study on students' international mobility experience," *Qual Quant*, vol. 51, no. 2, pp. 525–544, Mar. 2017, doi: 10.1007/s11135-016-0421-3.
- [9] M. Paynter, W. H. Sharpe, A. K. Halabi, V. Reimers, H. Ma, and C. Johnstone, "Chinese students' decisions to study in Australia after the COVID pandemic-based on the PESTLE factor analysis," *International Journal of Intercultural Relations*, vol. 96, Sep. 2023, doi: 10.1016/j.ijintrel.2023.101867.
- [10] J. Kosmaczewska, "Exploring the determinants of choosing an academic destination under a short-term mobility: a cross-cultural comparison of Poland and Portugal," *Journal of Marketing for Higher Education*, vol. 32, no. 1, pp. 138–158, 2022, doi: 10.1080/08841241.2020.1834487.
- [11] E. Kara, "A Contemporary Approach For Strategic Management in Tourism Sector: PESTEL Analysis on The City Muğla, Turkey," *Journal of Business Research - Turk*, vol. 10, no. 2, pp. 598–608, Jun. 2018, doi: 10.20491/isarder.2018.446.
- [12] R. Shields, "Globalization and international student mobility: A network analysis," *Comp Educ Rev*, vol. 57, no. 4, pp. 609–636, Nov. 2013, doi: 10.1086/671752.
- [13] K. Zhai and K. Cao, "Determinants of Chinese students' increasing pursuit of UK's taught master degree under the third wave of international education mobility," *Asia Pacific Journal of Education*, 2022, doi: 10.1080/02188791.2022.2081129.
- [14] T. Weber, C. Van Mol, and M. H. J. Wolbers, "Destination choices of international students in the Netherlands: A meso-level analysis of higher education institutions and cities," *Popul Space Place*, vol. 30, no. 4, May 2024, doi: 10.1002/psp.2744.
- [15] R. Caruso and H. de Wit, "Determinants of Mobility of Students in Europe: Empirical Evidence for the Period 1998-2009," *J Stud Int Educ*, vol. 19, no. 3, pp. 265–282, Jul. 2015, doi: 10.1177/1028315314563079.
- [16] H. De Haas, "Working Papers The determinants of international migration Conceptualising policy, origin and destination effects The IMI Working Papers Series," 2011. [Online]. Available: www.migrationdeterminants.eu
- [17] H. Cebolla-Boado, Y. Hu, and Y. N. Soysal, "Why study abroad? Sorting of Chinese students across British universities," *Br J Sociol Educ*, vol. 39, no. 3, pp. 365–380, Apr. 2018, doi: 10.1080/01425692.2017.1349649.
- [18] P. Yang, "Compromise and complicity in international student mobility: the ethnographic case of Indian medical students at a Chinese university," *Discourse*, vol. 39, no. 5, pp. 694–708, Sep. 2018, doi: 10.1080/01596306.2018.1435600.
- [19] R. Caruso, "Crime and sport participation: Evidence from Italian regions over the period 1997–2003," *J Socio Econ*, vol. 40, no. 5, pp. 455–463, Oct. 2011, doi: 10.1016/j.socrec.2010.09.003.
- [20] M. Beine, R. Noël, and L. Ragot, "Determinants of the international mobility of students," *Econ Educ Rev*, vol. 41, pp. 40–54, 2014, doi: 10.1016/j.econedurev.2014.03.003.

- [21] S. Guru, N. Bhatt, and N. Agrawal, "Ranking the Determinants for International Education Destination Decision of Indian Students: Application of Fuzzy Analytical Hierarchical Process," *Vision*, vol. 26, no. 3, pp. 314–327, Sep. 2022, doi: 10.1177/0972262921991940.
- [22] "Project Atlas," 2023. Accessed: Jul. 30, 2024. [Online]. Available: <https://www.iie.org/research-initiatives/project-atlas/>.