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What influences the direction and magnitude of Asian student mobility? Macro data analysis focusing on restricting factors and lifelong planning

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What influences the direction and magnitude of Asian student mobility? Macro data analysis focusing on restricting factors and lifelong planning

This study aims to explore the factors that influence Asian student mobility using a life planning model, which focuses on students' lifelong planning and restricting factors in decision making. As a result of macro data analysis of student mobility from six Asian source countries to eight major destinations from 1999 to 2017, the income gap between source country and destination country shows a negative correlation with student mobility, which supports the hypothesis that a decrease in budgetary constraints promotes study abroad. This finding is contrary to the assumption of the traditional push-and-pull model. This may be explained by the expansion of a middle-class population who are eager to send their children abroad whenever the budgetary constraint is lifted. Bilateral trade shows a positive correlation, which supports the hypothesis that prospect of employment, associated with economic connectedness, promotes study abroad.

Keywords: international student mobility; life planning model; push-and-pull model; gravity model; rational choice theory

Introduction

The recruitment of international students has been a topic that has attracted the interest of many countries, from the perspectives of acquisition of talent, export income, and soft power, among other things. Many studies have focused on the factors that influence the mobility of these students, and a number of theories and models have been developed by researchers in various fields, such as education, economics, sociology, geography, and psychology. As the largest student mobility had been observed from the developing nations to the western industrialized nations (Altbach 1991, 309), the push-and-pull theory of migration has been the foremost utilised theory to explain decision making of international students (Rounsaville 2012). However, in the past 20 years, we have witnessed a number of significant changes in source and destination countries.

One significant change observed in source countries is the rising personal incomes and aspirations for international education in newly industrialising countries (Choudaha 2017), and this is most evident in Asia. The number of internationally mobile students rose from 2.03 million in 1999 to 5.31 million in 2017, and the percentage of Asian students rose from 37.9% to 50.9% during the same period. The largest increase is observed in Southern Asian countries, which increased from 5.7% to 11.6% of the world total, followed by Eastern Asian countries, which increased from 14.8% to 21.0% (UNESCO Institute for Statistics, n.d.). Most of these students are self-funded, and their tuition fees have been a valuable source of revenue for institutions in countries where governments have cut budgets for higher education (Choudaha 2017; Glass, Streitwieser, and Gopal 2019).

Among destination countries, the percentage of major English-speaking countries (i.e. the USA, the UK, Australia, Canada, and New Zealand) has slightly declined from 42.3% in 2005 to 38.9% in 2017 (UNESCO Institute for Statistics, n.d.), while non-English-speaking countries that have comparative disadvantages in international student recruitment have exerted efforts to attract international students by providing scholarships, and expanding English-taught programs (OECD 2018, 223). The motivation for this is to secure them as a future skilled workforce and as entities that can strengthen diplomatic, economic, and cultural ties with their home countries. These efforts are observed not only in traditional destinations, such as Germany, France, and Japan, but also in emerging economies, such as China, Malaysia, and Singapore (De Wit 2015; Wu 2018; Yang 2020). An increase in the number of international students in China is notable: it rose sharply from 44,711 (with 11,479 studying in degree courses) in 1999 to 489,172 (with 241,543 in degree courses) in 2017 (Ministry of Education of China 1999, 2017).

Owing to demographic challenges, such as the ageing of the population, some destination countries have adopted measures to retain international students after they graduate, while some countries, such as the UK and the USA, have tightened their immigration policies, which has negatively affected the flows of international students (Choudaha 2017). Economic development in Asian countries has opened ways for international students to find employment back in their home countries (Sato 2019; Zhai, Gao, and Wang 2019), which may be regarded as the realisation of brain circulation.

Considering these changes in the context of student mobility, existing models, which have been developed on the assumption that economic and social gaps between source countries and destination countries are the major driving forces for student mobility and immigration, must be re-examined.

This study aims to explore the factors that influence the direction and magnitude of Asian student mobility by macro data analysis, using a model that may better explain their recent mindset and situation. The life planning model, which focuses on students' lifelong planning and restricting factors in decision making, is selected after a careful review of existing models. Then, student data from six major source countries in Asia to eight major destination countries are analysed in terms of economic and social variables based on this model. Further, student data to four English-speaking countries and four non-English-speaking countries are analysed and compared to identify the characteristics of Asian students who choose a destination country based on these two categories. Lastly, the results are discussed by examining the actual situation of the six Asian source countries.

The remainder of this paper is organised as follows. In the next section, major theoretical models explaining the magnitude of student flow are reviewed, and the characteristics of the life planning model are explained. The third section explains the

data and method, and the fourth section presents the results of the panel data analysis of student mobility from the six Asian countries to eight major destination countries based on the life planning model. In the final section, the results are discussed by examining the actual situation of the six countries, and limitations of the research are stated.

Review of the major theoretical models

Major theoretical models to explain the magnitude of student flow have been formulated by expanding the immigration and trade models (Mizuta 2019). The push-and-pull model of immigration was first advocated by the English geographer Ravenstein (1885) to explain people's mobility in the UK. He assumed that adverse conditions (such as bad governance or high tax) push people out of his/her birthplace to a new place which offers better conditions (such as advanced economy or good living environment), and he referred this as 'law of migration'. His push-and-pull model was later explained using the following equation by Dorigo and Tobler (1983):

$$M_{ij} = (R_i + E_j)/d_{ij} \quad (1)$$

They assumed that M_{ij} (magnitude of people's mobility from place i to place j) is explained by the sum of R_i (rejecting or push away force from place i) and E_j (enticing or pull force to place j), divided by d_{ij} (distance expressed by kilometres, travel cost, travel time, social distance, etc.). Sjaastad (1962) developed another equation that considers the cost and return of migration based on the push-and-pull model, assuming that the decision of migration depends on the expected economic gain, expressed by discounted and aggregated difference in earnings and living cost between source region/country and destination region/country, minus the cost of migration. It is based on an assumption that people make rational choices to maximise their income and minimise costs.

Altbach, Kelly, and Lulat (1985) applied the push-and-pull model to international student mobility, listing negative public developments in source countries as push factors and better educational and economic conditions in host countries as pull factors. Altbach (1991) highlighted that the decision to study abroad should be considered from the perspectives of individual students, sending country, and host country, although individual and family priorities are of primary importance for privately-funded Third World students. McMahon (1992) examined the flow of students from 18 developing countries to five developed countries during the 1960's and early 1970's based on the push-and-pull model and found a negative correlation between the economic prosperity of the source country and outbound student flow (push factor) and positive correlation between the relative economic size of the host country and inbound student flow (pull factor). Further, Mazzarol and Soutar (2002) assumed that international students undergo three-stage decision making in their study abroad. The first stage is the decision to study internationally, which is influenced by a series of push factors. The second and third stages are the selection of a host country and a host institution, respectively, which are influenced by several pull factors. Based on a survey of students from four Asian countries, they extracted knowledge of the host country, the recommendation of friends and relatives, environment and social link, and proximity as the most important pull factors for the selection of host country and institution.

The gravity model, which applies Newton's law of universal gravitation to economics, became the basis of the international trade model. Gravity increases in proportion to the mass of the two entities and decreases in proportion to their distance. In its analogy, international trade is assumed to increase in proportion to the economic size of the two countries and inversely proportional to their distance. After the successful verification of this model in the study of international trade (Tinbergen 1962), it was

further applied to explain immigration. Lewer and Van den Berg (2008) assumed that migration has a positive correlation to population size and difference of income level of the two countries and has a negative correlation to their physical distance among other things. They verified this assumption based on the immigration data of 16 OECD countries.

The gravity model was further used to explain international student mobility. Beine, Noël, and Ragot (2014) analysed the inflow of international students in 13 OECD countries from 2004 to 2007 to find out that student number negatively correlates with the physical distance between the source country and the destination country and positively correlates with the number of source country migrants in the destination country, the existence of a common official language, and the colonial link. The number of source country migrants is a variable that embodies a migration network, which is regarded as an important factor for the perpetuation of migration according to network theory (Massey et al. 1993, 448-449). Abbott and Silles (2016) analysed international student data from 38 source countries to 18 destination countries from 2005 to 2011 to discover that time difference, which was used instead of physical distance as a deterrent to mobility, has a negative correlation with student mobility while common language and the total number of outbound students from the source country have a positive correlation. The ratio of the real gross domestic product (GDP) per capita of the destination country relative to the GDP per capita of the source country, which is supposed to represent the wage differential, and the mean institutional ranking of the destination country showed a positive correlation with the student flow from non-high-income countries.

Wei (2013) focussed on economic and educational factors for his analysis of international student mobility among 48 countries from 1999 to 2008. As economic factors, he used per capita GDP gap and bilateral trade volume in goods. Per capita GDP gap

represents the difference in development level, assuming the larger the gap, the larger the student flow, which is based on the push-and-pull model. Meanwhile, bilateral trade volume represents the economic connections of two countries, which, he assumed, will indirectly reduce the cost of the flow. Educational factors include student–teacher ratio, higher education expenditure as a percentage of GDP, and higher education enrolment rate as a proxy for the education level of inflow countries. The result of the analysis demonstrates that the bilateral trade volume had a significant positive correlation at the 1% level and the higher education expenditure as a percentage of the GDP showed a positive correlation at the 10% level. Further, the analytic results of student flow from developing to developed countries demonstrate a significant positive correlation with per capita GDP gap at the 1% level.

Barnett et al. (2016) analysed the flow of international students among 210 countries based on network theory. Their hierarchical cluster analysis of student flow revealed four major clusters, of which the largest cluster is composed of English-speaking countries (mainly student destinations) and East and South-East Asian countries (mainly as source countries), indicating a centre-periphery network structure consistent with the world-system theory. They also highlighted that network variables such as telecommunications, bilateral hyperlink connections, trade, common borders, and common languages have a positive effect, while physical distance has a negative effect on the flow of international students at the 1% level.

There have been attempts to synthesise different models. Chen (2007) developed a model to analyse the decision making of international postgraduates in Canada, combining the push-and-pull model (Mazzarol and Soutar 2002), three-stage model (Hossler et al., 1989), and social capital theory. Rounsaville (2012) proposed a new theoretical framework combining three influential capital theories (human, cultural, and

social capital) to analyse the decision making of international students in the UK, Ireland, and the USA. Human capital is knowledge, skills, abilities, and traits that affect human capabilities to do productive work (Schultz 1961), and international students consider the rate of return (increase of human capital) of their investment in international education (Agarwal and Winkler 1985); cultural capital is referred to as cultural advantages acquired through education, family, and other sources (Bourdieu 1986). Social capital is defined as social connections and networks upon which an individual can draw to advance their economic success and wellbeing (Coleman, 1988).

Lu (2006) mediates micro and macro approaches in exploring international students' decision making by applying the structuration theory of Giddens, which addresses dialectic relationships between structure and human agents. She asserts that a macro approach represented by push-and-pull theory and a micro approach represented by rational choice theory (RCT) can be articulated in her framework, which encompasses social structures and individual factors in explaining international students' motivation (in her case, migration intention of Chinese students in Canada). Friedman and Hechter (1988) assert that RCT is not confined to micro-level analysis but can contribute to a variety of problems in macrosociology. They argue that individual action is subject to two major constraints, namely, scarcity of resources and social institutions that are related to the social outcome at the macro-level.

Sato (2016) proposed a model to analyse factors that influence international students' choice of study destination, workplace, and place of settlement. She assumes that 'restricting factors (cost, language, intention of family, visa etc.) are considered first in their decision making and the other four factors (i.e. capacity development/utilization, better employment prospect, social environment, and others) will be considered in the second round, depending on their priorities. She also asserts that their decision making is

influenced by policies and economic, institutional, and cultural factors of their source country and destination country. Her assertion is in line with the assumption of RCT that the scarcity of resources and social institutions affect individual action, as presented by Friedman and Hechter (1988).

Her model, shown in Figure 1., also assumes that the choice of study destination is often made by considering their future choice of workplace and place of settlement. From this perspective, we would like to call it ‘life planning model’ in this paper.

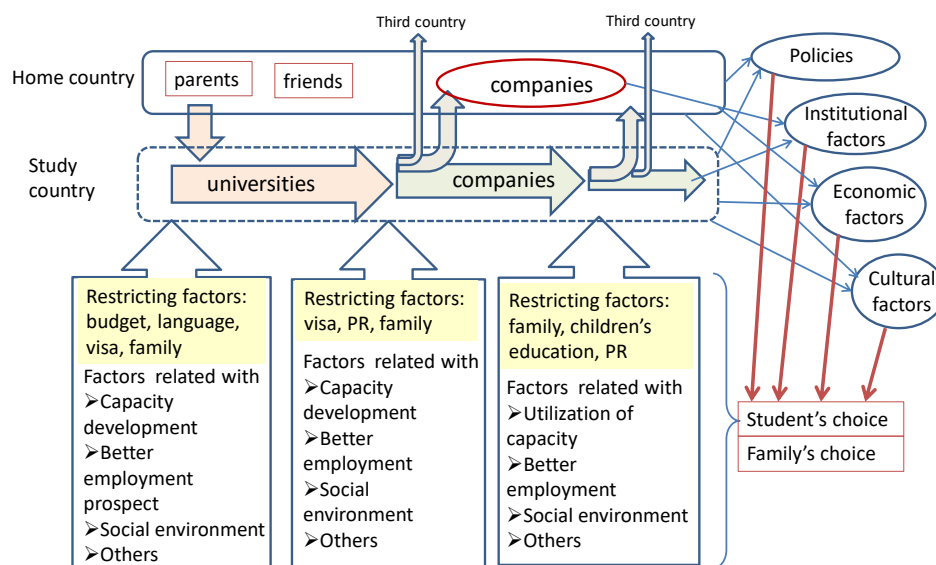


Figure 1. Life Planning Model Source: Translated from Fig. 1 of Sato (2016)

In our exploration of a model which explains the recent mobility of Asian students, we would like to use this life planning model, considering its expansion despite the narrowing economic gap with destination countries. A linear migration model, as represented by push-and-pull theory, may not explain this phenomenon well. It is also important to consider future employment opportunities as a factor affecting students' choice of study destination. With the globalization of economy and increase of multinational companies, students may opt to find employment at such a company back in their home country, utilizing their connection with their study destination country.

Although this model was designed to explain the choice of international students, we assume that it can be applied to explain student mobility because the factors predicting the flow of international students at the macro and micro levels are not mutually exclusive but are linked (Barnett et al. 2016, 5). Individual students take actions considering the economic and social outcomes of source and destination countries. The household budget situation is also reflected in economic indicators such as per capita GDP.

Analysis based on the life planning model

Data and method

To explore the factors that influence Asian student mobility, student mobility data from six major source countries in Asia (i.e. China, India, Vietnam, Indonesia, Thailand, and Nepal) to eight major destination countries (i.e. the USA, the UK, Australia, Germany, France, Canada, China, and Japan) are used and their relationship with economic and social indicators is examined based on the life planning model. Six source countries are selected from the top student sending countries in Asia and eight destination countries are among the largest recipients of students from these countries (UNESCO Institute for Statistics, n.d.). To examine the longer trend, the target period was set from 1999 to 2017 when reliable student data is available. Autocorrelation (prior student mobility affects the subsequent student mobility) was hardly detected as the values of Durbin-Watson statistics using Feasible Generalized Least Square estimation (Prais-Winsten method) ranged from 1.28 in India to 1.99 in Nepal. Most of the data were obtained from ‘Database for Higher Education Mobility Study (DHEMS)’ developed at Hitotsubashi University by merging data extracted from open data sources of OECD, UNESCO, World Bank, ILO, and UNCTAD. However, the data on the number and tuition fees of international students in China were obtained from the statistics of the Ministry of

Education of China (1999-2018). Since relatively large number of international students are enrolled in non-degree courses, only those in degree courses were counted as the number of international students in China in the analysis.

Explanatory variables for student mobility were selected from the economic and social indicators that represent the influencing factors listed in the life planning model. As a proxy of budgetary constraint, which is a primary restricting factor for student households in a source country, two variables were chosen: the ratio of per capita GDP of the destination country relative to that of the source country and tuition fees in the destination countries. Ratio of per capita GDP represents the income gap between the two countries and can indicate budget deficiency of student household, compared to the economic requirements in a destination country. Tuition fees comprise a major component of such economic requirements. Cost factors other than tuition fees are assumed to be reflected in the ratio of per capita GDP.

Language is another restricting factor that will influence students' destination. Because English is the *lingua franca* of the globalized world and most often taught as the first foreign language in secondary and/or elementary education (OECD 2018: 223), language barriers are supposed to be smaller in English-speaking countries than in non-English-speaking countries.

Unemployment rate is an indicator related to better employment prospect. High youth unemployment in a source country can be a push factor for study abroad. High unemployment rate in a destination country, on the other hand, will be perceived as a sign of the narrowness of such an opportunity. It can also lead to the tightening of immigration policy.

Merchandise trade volume between source and destination countries was used as an indicator of better employment prospect because economic connectedness represented

by trade volume is often associated with employment opportunities either in the destination or back in the source country. Service trade was not included because income from international education is counted as a part of service trade and may hamper proper statistical analysis.

The following equation (2) was used to examine the relationship of the above-mentioned indicators and the mobility of Asian students.

$$\ln(S_{ijt}) = \alpha + \beta_1 \cdot \frac{GDPpc_{jt}}{GDPpc_{it}} + \beta_2 \cdot \ln(Tui_{jt}) + \beta_3 \cdot Uemy_{it} + \beta_4 \cdot Uem_{jt} + \beta_5 \cdot \ln(Tra_{ijt}) + Lan_j + v_i + v_j + \varepsilon_{ijt} \quad (2)$$

Here, the objective variable S_{ijt} is the number of international students from source country i at a higher education institution of destination country j in year t .

$\frac{GDPpc_{jt}}{GDPpc_{it}}$ is the ratio of per capita GDP of destination country j in year t to that of the source country i in year t . As a proxy of budgetary constraint, a negative correlation with student number is expected in the life planning model ($\beta_1 < 0$), while a positive correlation is expected ($\beta_1 > 0$) in the traditional push-and-pull model in which income gap is a driving force for student mobility.

Further, Tui_{jt} represents average tuition fees of international students in higher education institutions in destination country j in year t . Negative correlation with student number is expected ($\beta_2 < 0$) because high tuition fees can be a restricting factor for student mobility. Lan_j is a dummy variable for the language used in destination country j : $Lan_j = 1$ if the destination is an English-speaking country, while $Lan_j = 0$ if the destination is a non-English-speaking country. A positive correlation is expected as language barriers are supposedly smaller in English-speaking countries as explained above.

$Uemy_{it}$ is the youth unemployment rate (from 15 to 25 years old) of source country i in year t , whereas Uem_{jt} is the unemployment rate (above 15 years old) of destination country j in year t . They are related to ‘better employment prospect’ of the life planning model: a positive correlation is expected with $Uemy_{it}$ ($\beta_3 > 0$), while a negative correlation is expected with Uem_{jt} ($\beta_4 < 0$).

Tra_{ijt} is the value of merchandise trade between source country i and destination country j in year t . This indicator represents the employment opportunities associated with the economic connectedness of the source country and destination country ($\beta_5 > 0$). α is a constant; v_i and v_j are unobserved factors that are specific to source country i and destination country j , respectively; and ε_{ijt} is the error term.

Name of variable	Sign in equation (2)	Definition	Data Source	mean	sd	min	max
student	S_{ijt}	Number of international students from source country i who study at a higher education institution of a destination country j in year t	UNESCO Institute for Statistics, Ministry of Education of China	14,117	32,233	0	321,625
gdpratio	$\frac{GDP_{pcjt}}{GDP_{pcit}}$	Ratio of per capita GDP of the destination country relative to that of the source country	World Bank Open Data	34.53	32.63	0.43	168.26
homeyunempt	$Uemy_{it}$	Youth unemployment rate of those from 15 to 25 years old of source country i in year t	ILOSTAT	8.29	5.63	2.00	25.80
hostunempt	Uem_{jt}	Unemployment rate of those above 15 years old in destination country j in year t	ILOSTAT	6.19	2.15	0.49	15.53
trade	Tra_{ijt}	Bilateral merchandise trade value between source country i and destination country j in year t in thousand US\$. Calculated by: (value of export + value of import)/2	UNCTADSTAT	1.34E+07	3.26E+07	13	2.92E+08
tuitionfee	Tui_{jt}	Estimated average annual tuition fees of international students in higher education institutions in destination country j in year t in equivalent US\$ converted using PPPs, considering the percentage of students in institution type (OECD countries) and student' majors and level of education (China).	OECD, Ministry of Education of China	7,314	5,862	0	25,683

Table 1 presents the definitions, data sources, and basic statistics of the major variables except for Lan_j . To control for extreme values and normalise highly skewed distributions, a log transformation is used for student number, tuition fees and trade value.

Table 2 presents the GDP per capita and the number of students from six Asian source countries to eight destination countries in the years 1999, 2004, 2009, 2013, and 2017 and the ratio of value in 2017 relative to that in 1999.

Table 2. GDP per capita and number of international students from six Asian countries (1999-2017)

	Year	GDP per capita (current US\$)	Number of students to seven destination countries							
			USA	UK	Australia	Canada	Germany	France	Japan	
China	1999	873	46,949	4,250	4,578	3,489	5,355	1,934	25,655	
	2004	1,509	87,943	47,738	28,309	18,141	25,284	11,514	76,130	
	2009	3,838	124,225	47,033	70,357	23,619	21,198	23,590	79,394	
	2013	7,078	225,474	81,776	87,980	42,011	19,441	25,234	89,788	
	2017	8,759	321,625	96,543	128,498	66,161	27,765	24,788	79,375	
	2017/1999	10.0	6.9	22.7	28.1	19.0	5.2	12.8	3.1	
Thailand	Year	GDP per capita (current US\$)	Number of students to eight destination countries							
			USA	UK	Australia	Canada	Germany	France	Japan	China
	1999	2,033	11,497	2,753	2,609	192	328	207	950	107
	2004	2,660	8,937	3,754	5,449	282	958	618	1,604	357
	2009	4,213	8,592	4,674	4,377	384	822	768	2,193	3,217
	2013	6,168	7,000	5,983	3,160	447	462	524	2,150	7,656
2017	6,578	6,406	6,103	7,427	462	544	440	3,054	11,911	
2017/1999	3.2	0.6	2.2	2.8	2.4	1.7	2.1	3.2	111.3	
Indonesia	Year	GDP per capita (current US\$)	Number of students to eight destination countries							
			USA	UK	Australia	Canada	Germany	France	Japan	China
	1999	671	11,177	1,173	8,976	375	1,910	195	1,030	193
	2004	1,150	8,880	1,107	10,184	657	2,572	223	1,474	859
	2009	2,261	7,386	1,029	10,205	777	1,546	298	1,788	2,922
	2013	3,624	7,340	1,650	9,453	684	1,558	656	2,244	5,389
2017	3,837	8,782	3,620	11,040	888	2,394	822	3,616	8,124	
2017/1999	5.7	0.8	3.1	1.2	2.4	1.3	4.2	3.5	42.1	
Vietnam	Year	GDP per capita (current US\$)	Number of students to eight destination countries							
			USA	UK	Australia	Canada	Germany	France	Japan	China
	1999	363	1,461	144	1,271	102	1,505	1,148	432	126
	2004	547	3,165	703	2,619	426	2,006	2,950	1,340	2,220
	2009	1,217	12,612	2,064	7,648	675	1,833	5,803	2,895	8,447
	2013	1,887	15,406	4,048	12,383	1,407	1,415	5,362	4,241	8,838
2017	2,366	23,204	3,704	15,298	2,367	2,380	4,587	26,768	6,564	
2017/1999	6.5	15.9	25.7	12.0	23.2	1.6	4.0	62.0	52.3	
India	Year	GDP per capita (current US\$)	Number of students to eight destination countries							
			USA	UK	Australia	Canada	Germany	France	Japan	China
	1999	442	34,504	3,922	3,697	804	1,004	149	182	0
	2004	628	79,736	14,625	15,742	2,724	4,237	494	280	689
	2009	1,102	101,563	34,065	26,573	4,617	3,273	1,252	552	8,064
	2013	1,450	92,597	22,155	16,150	13,626	5,645	1,828	535	10,848
2017	1,981	142,618	16,421	51,976	32,616	13,387	2,823	873	18,946	
2017/1999	4.5	4.1	4.2	14.1	40.6	13.3	18.9	4.8		
Nepal	Year	GDP per capita (current US\$)	Number of students to eight destination countries							
			USA	UK	Australia	Canada	Germany	France	Japan	China
	1999	214	2,171	151	346	21	66	15	158	304
	2004	286	4,384	394	616	57	222	37	343	1,430
	2009	478	11,391	693	3,900	96	366	45	1,457	2,511
	2013	716	8,537	1,699	7,212	168	635	61	2,426	3,011
2017	901	12,304	606	21,065	243	904	97	12,783	4,292	
2017/1999	4.2	5.7	4.0	60.9	11.6	13.7	6.5	80.9	14.1	

Notes: Since the number of Nepali student to Australia in 1999 is not available, the number in 2000 is shown in the column.

Although all six source countries have enjoyed economic development, the extent differs by country. The ratio of GDP per capita in 2017 relative to that in 1999 is highest

in China (10.0) and lowest in Thailand (3.2). China, Thailand, and Indonesia are among the upper-middle-income countries, while Vietnam, India, and Nepal are among the lower-middle-income countries, according to the classification of the World Bank (2021).

Findings

Table 3 presents the results of panel regression analysis of student mobility from the six Asian countries to eight destination countries and that from the three lower-middle-income countries (Vietnam, India, and Nepal) to eight destination countries. Owing to the result of the Hausman test and F test, fixed-effect regressions were supported in both cases. Since fixed-effect regression focuses on the effect of time-variant variables, the time-invariant variable *Lan* (language) is omitted. Multicollinearity is not observed because the variance inflation factor (VIF) values of the explanatory variables are less than 2.88 and the mean VIF is 1.75 in the analysis of student flow from the six countries and the values are 2.97 and 1.94 in the analysis of student flow from the three lower-middle-income countries.

from six countries to eight destinations					from three low-middle-income countries to eight destinations				
R-sq:		Number of obs = 773			R-sq:		Number of obs = 395		
within = 0.5999					within = 0.5839				
between = 0.4026					between = 0.3539				
overall = 0.4132		F(5,727) = 218.03			overall = 0.3707		F(5,369) = 103.57		
corr(u _i , X _b) = -0.6468		Prob > F = 0.0000			corr(u _i , X _b) = -0.6965		Prob > F = 0.0000		
Instudent	Coef.		Std. Err.	t	Instudent	Coef.		Std. Err.	t
gdpratio	-0.0099 ***		0.0018	-5.54	gdpratio	-0.0108 ***		0.0025	-4.3
homeyunempt	0.0238 *		0.0139	1.72	homeyunempt	0.0230		0.0485	0.47
hostunempt	-0.0096		0.0219	-0.44	hostunempt	0.0226		0.0383	0.59
Intrade	0.8323 ***		0.0365	22.82	Intrade	0.8168 ***		0.0557	14.65
Intuitionfee	0.2431 ***		0.0902	2.69	Intuitionfee	0.3673 **		0.1675	2.19
_cons	-5.9425 ***		0.8851	-6.71	_cons	-6.0611 ***		1.5535	-3.9
<i>Notes: *** p<0.01, ** p<0.05, * p<0.1</i>									

In both regressions, the ratio of per capita GDP shows a negative correlation at the 1 % level and bilateral trade shows a positive correlation with student mobility at the 1 % level. These results support the hypotheses of the life planning model.

Tuition fees at destination country show a positive correlation with student mobility at the 1% level in the regression of the six countries and the 5% level in the regression of the three lower-middle-income countries, contrary to the assumption of the life planning model. Further, youth unemployment in source countries has a positive correlation with student mobility at the 10% level in the regression of the six countries, which is in agreement with the hypotheses in both the life planning model and the push-pull model.

Table 4 presents the results of the analysis of student mobility from the six Asian countries to four English-speaking countries and four non-English-speaking countries. Fixed-effect regression is supported owing to the result of the Hausman and F tests. Multicollinearity is not observed because VIF values of explanatory variables are less than 1.12 and mean VIF is 1.06 in the analysis of student flow to English-speaking countries, and the values are 2.09 and 1.57 in the analysis of student flow to non-English-speaking countries.

From six countries to four English-speaking countries					From six countries to four non English-speaking countries				
R-sq:		Number of obs = 450			R-sq:		Number of obs = 323		
within = 0.6961					within = 0.5847				
between = 0.4822					between = 0.3301				
overall = 0.5059		F(5,421)	=	192.90	overall = 0.3294		F(5,301)	=	84.76
corr(u _i , Xb) = -0.4011		Prob > F = 0.0000			corr(u _i , Xb) = -0.8080		Prob > F = 0.0000		
Instudent	Coef.	Std. Err.	t		Instudent	Coef.	Std. Err.	t	
gdpratio	-0.0147 ***	0.0018	-8.24		gdpratio	-0.0079 **	0.0034	-2.32	
homeyunempt	0.0551 ***	0.0123	4.47		homeyunempt	-0.0049	0.0276	-0.18	
hostunempt	-0.0242	0.0180	-1.34		hostunempt	-0.0121	0.0559	-0.22	
Intrade	0.5761 ***	0.0376	15.33		Intrade	0.9949 ***	0.0699	14.23	
Intuitionfee	0.2501 ***	0.0673	3.72		Intuitionfee	0.3071	0.3113	0.99	
_cons	-1.8158 **	0.8374	-2.17		_cons	-9.3353 ***	2.2468	-4.15	
<i>Notes: *** p<0.01, ** p<0.05, * p<0.1</i>									

As presented in Table 4, a higher fitness of the model is observed in the analysis of student mobility to English-speaking countries: the ratio of per capita GDP shows a stronger negative correlation and youth unemployment in source countries shows a

stronger positive correlation at the 1 % level, which supports the assumption of the life planning model. Tuition fees of the destination country also show a stronger positive correlation at the 1 % level, although it is contrary to the assumption of the life planning model. In the analysis of student mobility to non-English-speaking countries, youth unemployment in source countries and tuition fees of the destination country no longer show significant correlation, while the ratio of per capita GDP shows a negative correlation at the 5% level and trade shows a positive correlation at the 1% level, supporting the hypotheses of the life planning model.

Discussion and conclusion

Based on the analysis result, we could confirm that the ratio of per capita GDP shows a negative correlation with student mobility not only from the six Asian countries but also from the three lower-middle-income countries at the 1% level. This supports the hypothesis in the life planning model that the decrease of budgetary constraint plays a critical role in the decision to study abroad. This may be explained by the expansion of a large middle-class population who are eager to send their children abroad whenever the budgetary constraint is lifted. This type of population seems to expand not only in upper-middle-income countries but also in lower-middle-income countries.

Bilateral trade shows a strong positive correlation with Asian student mobility at the 1% level, which also supports the hypothesis that the prospect of employment, associated with economic connectedness between the two countries, induces student flow. It also indirectly supports the gravity model, which is based on the trade model. Distance, which often showed negative correlation with student mobility in previous studies, is incorporated as a factor to determine trade volume in this model.

Tuition fees in the destination country show a positive correlation with student mobility, especially in the student flow to English-speaking countries, which is contrary

to the hypothesis in the life planning model. This result indicates the Chivas Regal Effect that higher price is perceived as evidence of a quality brand (Askin 2016). Average tuition fees for international students in 2017 are estimated to be US\$ 18,340 in the four English-speaking countries, whereas it is only US\$ 3,164 in the four non-English-speaking countries. It implies the expansion of a large middle-class population who are eager to pay for better international education even in lower-middle-income countries.

Youth unemployment in source countries shows a positive correlation at the 10% level in the analysis of student flow from the six countries to the eight destinations, and at the 1% level in the analysis of student flow to English-speaking countries. This result indicates that the desire for better employment is a push factor, which supports both the life planning model and the push-and-pull model. It also implies that Asian students who study in English-speaking countries, possibly from better-off families, are more sensitive to employment opportunities in their home countries.

Now, we would like examine the actual situation of the six Asian source countries to explore the background causes of these results.

China has been the largest student source country: the percentage of Chinese students of total international students in the world rose from 6.8% in 1999 to 17.4% in 2017 (UNESCO Institute for Statistics, n.d.). China attained the largest increase of per capita GDP among the six Asian countries, which led to the rapid narrowing of income gap with destination countries. This reduction of budgetary restraint seems to have spurred study abroad in China.

As shown in Table 2, the largest increase in Chinese student number is observed in Australia, UK, and Canada. USA has been the most popular destination for Chinese students. The percentage of Chinese students in these four countries of all the outbound

Chinese students rose from 43.1% in 1999 to 66.0% in 2017, implying high income elasticity for international education offered in English-speaking countries.

China joined the World Trade Organization in 2001, which provided important momentum for its trade expansion. The merchandise trade with USA grew by a factor of 7.3 and that with Australia by a factor of 15.2 since then. Though the percentage of Chinese students who return to China after studying abroad has been increasing (National Bureau of Statistics of China 2020), the expansion of trade with destination countries must have been associated with an increase of employment opportunities at the companies that engage in some kinds of transactions with their destination countries.

Despite its rapid economic development, youth unemployment rate in China rose from 6.8% in 1999 to 10.6% in 2017, which can be another reason for the increase in outbound student mobility. According to the survey of the Center for China and Globalization (CCG) and Mycos Research Institute of 2,315 Chinese students studying abroad, the top reason to study abroad is ‘to enhance the comprehensive competitiveness of the profession,’ followed by ‘learning advanced knowledge and skills’ (CCG 2021, 45). This result shows Chinese students’ expectation of enhancing their employability by studying abroad.

Regarding Thai students, the largest increase is observed in China: the ratio of Thai students in China in 2017 relative to that in 1999 is as high as 111, as shown in Table 2. On the contrary, the number of Thai students in the USA became 60% of that in 1999. One of the reasons for this rapid increase of Thai students in China can be attributed to the expansion of trade with China. Merchandise trade with China in 2017 was 17.1 times as large as that in 1999, while trade with USA remained 2.2 times. These figures imply the close link between student mobility and trade.

Thai students compose the second largest group after Korea among international students in China in 2017 (Ministry of Education of China 2018). The Belt and Road Initiative by the Chinese government, which includes scholarship provision to the students in the Belt and Road region (Ministry of Education of China 2016), is another reason for the increase of Thai students in China.

Indonesia has a similar tendency to that observed with Thailand: the number of Indonesian students in China in 2017 became 42.1 times as large as that in 1999, while the trade with China expanded 14.4 times during the same period. The number of Indonesian students in USA in 2017 was 80% of that in 1999 while the increase in trade volume with USA remained at 2.6 times during the period. Since Indonesia has the world's largest Muslim population, 9.11 may have negatively impacted student mobility to USA.

Australia remains the most popular destination for Indonesian students after 2000. Since the increase of trade volume with Australia remained at 2.7 times from 1999 to 2017, this may also be attributed to the active student recruitment by Australian universities. Youth unemployment rate in Indonesia was as high as 15.3% in 2017, which can be counted as a push factor for student mobility.

The largest increase in Vietnamese students is observed in Japan followed by China. In 2017, the most popular destination for Vietnamese students was Japan, followed by USA and Australia. One reason for the rapid increase of Vietnamese students in Japan is because the upper limit on part-time jobs undertaken by international students is a generous 28 hours per week, longer than other major destination countries. This has enabled students with insufficient funds to earn their living while studying in Japan (Sato, Breden, and Funai 2020).

Vietnam achieved the second-highest rise of per capita GDP after China among the six countries from 1999 to 2017, while the number of Vietnamese students studying abroad became 11.7 times as large during the same period (UNESCO Institute for Statistics n.d.). The reduction of budgetary restraints seems to have spurred study abroad but lower per capita GDP regulates their destination and study style.

The largest increase of Nepalese students is observed in Japan for the same reason with Vietnamese students: the longer upper limit on part-time jobs enables students with insufficient funds to study in Japan (Sato, Breaden, and Funai 2020). Australia hosted the largest number of Nepalese students in 2017, followed by Japan and USA. Bank loans have played an important role in the increase of Nepalese students in Australia (Upadhyay-Dhungel and Lamichhane 2011). Outbound mobility ratio (percentage of study abroad students in total tertiary enrolment) of Nepal was 17.3 in 2017, much higher than the world average of 2.4 (UNESCO Institute for Statistics, 2019). Nepalese youth seems to have a strong aspiration to study abroad by resorting to every possible means.

India has been the second-largest source country in the world next to China. Its percentage in the world total rose from 3.0% in 1999 to 6.3% in 2017. Rapid increase of Indian students is observed in China and Canada, although the ratio of Indian student number in China in 2017 relative to that in 1999 cannot be calculated because the number was 0 in 1999. Trade with China expanded 46.8 times during the same period.

USA was the most popular destination for Indian students, followed by Australia and Canada in 2017. The number of Indian students in the four English-speaking countries as percentage of the total outbound Indian students was 71.4% in 2017, highest among the six Asian countries, seemingly influenced by the fact that English is one of the official languages of India. Youth unemployment rate in India was 10.3% in 2017, which can be counted as a push factor for student mobility.

From the above analyses, we can confirm that the increase of household income, which led to the reduction of income gap and budgetary constraint, has expanded student mobility in all six Asian countries, supporting the assumption of the life planning model. This phenomenon can be explained by the expansion of a middle-class population who are eager to send their children abroad whenever the budgetary constraint is lifted. The positive correlation between tuition fees and student mobility can also be explained by their aspiration for better international education.

We confirm the positive relationship between trade and student mobility, supporting the assumption of the life planning model. China's emergence as a trade hub has attracted students from other Asian countries, as has its Belt and Road Initiative to enhance its soft power by hosting more international students. The increasing economic gravity of China and other Asian countries seems to have promoted the return of students educated overseas. In this sense, the gravity model will be valid in explaining the mobility of not only current but also former international students.

Youth unemployment in some source countries is observed to be a push factor for student mobility, which supports both the life planning model and push-and-pull model. Instead of income gap, aspiration for better education and better employment seems to be working as new push factors. From this perspective, the push-and-pull model needs to be redefined considering the recent mindset of Asian households/students.

A limitation of this study lies in the negligence of factors that are not captured by macro-level data: the influence of critical incidents such as 9.11, Brexit, and political confrontations between the countries are not sufficiently considered in this analysis. Although the value of merchandise trade was used as the indicator of economic connectedness between the source country and destination country, service trade value should also be included in the next study, considering the increased importance of

intellectual capital flow and information-related activities, such as, financial services, computer software and information technology services, which are closely related with study subjects such as management and computer sciences.

The lower fitness of the model for student mobility to non-English-speaking countries may be attributed to the non-inclusion of explanatory variables related to scholarships, English-taught degree programmes, and part-time job opportunities. Lack of comparison by students' program type is another limitation. In future research, these perspectives will be incorporated to realize a better analysis of Asian student mobility in ever-changing circumstances.

Disclosure statement

No potential conflict of interest was reported by the author.

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