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Author(s): Mathies, Charles; Karhunen, Hannu

Title: Do they stay or go? Analysis of international students in Finland

Year: 2021

Version: Published version

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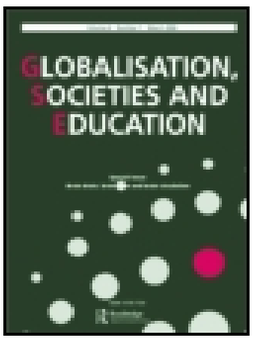
Please cite the original version:

Mathies, C., & Karhunen, H. (2021). Do they stay or go? Analysis of international students in Finland. Globalisation, Societies and Education, 19(3), 298-310. https://doi.org/10.1080/14767724.2020.1816926



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Globalisation, Societies and Education

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/cgse20

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To cite this article: Charles Mathies & Hannu Karhunen (2020): Do they stay or go? Analysis of international students in Finland, Globalisation, Societies and Education

To link to this article: https://doi.org/10.1080/14767724.2020.1816926

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GLOBALISATION, SOCIETIES AND EDUCATION
https://doi.org/10.1080/14767724.2020.1816926

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Do they stay or go? Analysis of international students in Finland

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ABSTRACT

The increase in international student mobility raises questions of how many international students choose to stay in their host country and the reasons why some stay and others leave. This study examines factors affecting international students to stay in Finland three years after graduation. Tracking 13 (years) graduating cohorts across national (Finland) data registries, we find family ties and labour market opportunities relate to an increased probability an international student stays in Finland three years after graduation.

ARTICLE HISTORY
Received 17 June 2020
Accepted 25 August 2020

KEYWORDS
International students; international student migration; stay rate; labour market; family ties

Introduction

The rapid increase of student mobility raises questions of how many international students choose to stay in the host country and why some stay while others leave after graduation. While the internationalisation of higher education is more than just students' moving across borders, it is an important manifestation of how higher education has become more international (Caruso and de Wit 2015). International students have emerged as prized and contested human resource, particularly for OECD countries, to attract and retain (Hawthorne 2018). Recent research (King and Sondhi 2018; Mosneaga and Winther 2013; Robertson 2013) argues family ties and labour market opportunities are key influences on international students staying in a host country. This study examines, on a national (Finland) level, how family ties and labour market opportunities relate to international students staying in country after they completed their studies.

Background

An increasing number of students study internationally each year. In 2016, more than five million students enrolled in higher education outside their country, almost double the number 10 years earlier (OECD 2018). In Finland, international students (degree seeking) have substantially increased from 6000 (2 per cent of all students) in 2000 to over 21,000 (7 per cent) studying in 2016 (CIMO 2014; Finnish National Agency for Education 2017). The issue of international student mobility and migration is a topic of considerable policy interest not just in Finland (CIMO 2014; Korhonen 2015; Kuokkanen 2019; YLE 2015) but also throughout Europe (Choudaha and de Wit 2014; Hawthorne 2018; Ministry of Higher Education and Science 2018). There has been a significant shift towards a controlled immigration of international students and increasing measures aimed to improve their stay rates across Europe (Caruso and de Wit 2015). This is occurring in large part

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due to concerns about decreasing or low birth rates and an ageing population; attracting international students is seen as a way to increase the number of needed skilled workers (European Commission 2010; King and Raghuram 2013; Ministry of Interior 2013; Riaño, Van Mol, and Raghuram 2018).

International students are 'ideal' immigrants, they are skilled and most are in prime employment age (Mosneaga and Winther 2013). They are attractive to host countries as they trained for that labour market (Ziguras and Law 2006) and do not require a lengthy or complex process to recognise qualifications (Robertson 2013). In short, international students offer a premium over migrants educated (trained) elsewhere (Hawthorne 2018). Despite increasing migration since 1990, Finland has a relatively homogenous population with roughly only 7.5 per cent of the 5.5 million population (2019) being non-Finnish; Russian (20 per cent of all foreigners) and Estonia (12 per cent) diaspora being the largest (Statistics Finland 2020). It is seen as essential for Finland's economic development '… that international students who graduate from Finnish higher education institutions will remain in Finland and become integrated in the society and the labour market' (CIMO 2015, 6).

Theoretical framework and research questions

Studying abroad, previously positioned as a temporary endeavour, is now a form of labour migration (Robertson 2013; Tremblay 2005). This shift occurred in the broader context of a globalised knowledge economy and the global race for skilled workers (Robertson 2013). International student migration (ISM) is a relatively new theoretical framework within global migration and human capital literatures (King and Sondhi 2018). Specifically, ISM sits at a nexus among education and migration policies intersecting with labour market needs and demands (Robertson 2013). It is a staggered process where individuals arrive on student visas and remain on temporary visas until they fulfil criteria for permanent residency; replacing previous models of permanent migration with a fixed entry (Robertson 2013).

A critical component of knowledge migration is the skills and knowledge of 'prospective' skilled workers (Mosneaga and Winther 2013). There are arguments whether students are actually 'skilled' because, in most cases, they have not demonstrated their abilities in the labour market (King and Sondhi 2018). However, training (educating) international students within national borders is increasingly important as they augment the supply of skilled workers available to national labour markets and are cheaper (plus easier) to recruit than importing skilled workers trained elsewhere (Ziguras and Law 2006).

King and Sondhi (2018) theorise ISM as a subset within four larger conceptual frameworks; highly skilled worker migration, product and mechanism of the globalisation of higher education, global youth cultures, and (social) class analysis. While ISM is concerned with international students coming into a country for a degree (degree mobility), it also takes into account the anticipated future economic benefits (long-term; for students, HEIs, and countries), family influences, and policy (educational, migration, etc.) effects (King and Sondhi 2018). It is a dynamic process where an individual student's agency is simultaneously constrained and enabled by external factors such as policy, family ties, and labour market opportunities (Mosneaga and Winther 2013).

King and Raghuram (2013) argue there is a compelling case for research on the ISM phenomena in quantitative studies linking systems of higher education and knowledge production. Specifically in Finland, the Ministry of Interior (2013) has called for statistical research on international migration including international students. Our study intends to fill these identified gaps as we hypothesise family ties and labour market opportunities relate to the probability international students staying in Finland after graduation. To our knowledge, this study was the first quantitative study examining multiple cohorts (years) of international graduates (13) on a national scale for long-term migration patterns controlling for family ties and labour market opportunities (ISM). Our two specific research questions are:

RQ1: What is the stay rate of international graduates in Finland three years after graduation?

RQ2: Do family ties and labour market opportunities relate, and to what degree, to an increased or decreased probability of international graduates staying in Finland three years after graduation?

Research design and data

Our sample consisted of international students graduating from universities of applied sciences (UAS, 24) and universities (14) in Finland between 1999 and 2011.[1] The initial sample (N = 13,056) captured all international students graduating according to the Registry of Completed Education and Degrees maintained by Statistics Finland. Individuals, who had foreign nationality in their enrolment year, are conditionally included based on having a valid Finnish personal identity code at graduation; this registry collects data on all completed degrees in Finland.[2] We constrained our sample by excluding individuals who completed secondary education in Finland (2222). Additionally, we removed individuals who speak Finnish or Swedish as their native language (167) and those who were over 45 years old when enrolling (170). Lastly, we removed individuals completing a bachelor degree in universities (224) due to the nature of the Finnish undergraduate degree structure in universities[3] as bachelor's degrees in Finnish universities are mainly offered only in Finnish and Swedish; international students are primarily admitted into English-taught masters and doctoral programmes within Finnish universities. We sorted students according to highest completed degree so not to count individuals twice.[4] We have in our sample 3705 international bachelor graduates from UAS (bachelors) and 5049 masters (masters) and 1519 licentiate and PhD (doctoral) graduates from universities. Thus, we observed 10,273 international graduates in total.

We tracked our sample for three years after graduation, via Finnish personal identity code, through Finnish national registers administered by Statistics Finland. Data collection was from the Finnish Longitudinal Census (demographic and family ties), the Longitudinal Employment Statistics (economic), and the Income Distribution Statistics (social benefits and taxes). Data on enrolment derived from the Student Registry while the Registry of Completed Education and Degrees provided information on the degree level, discipline, date, and institution granting the degree. Additionally, we created three graduation regions based on the location of the highest degree granting HEI. We placed HEIs located within or near Helsinki into the capital region; HEIs located within or near the cities of Tampere and Turku into the large city region and assigned remaining HEIs into the other region.

We constructed the main variable of interest, staying in Finland (dependent variable), using the population registry data on the place of residence and activity during a calendar year according to Finnish Income Distribution Statistics.[5] We defined the decision to stay in Finland as follows: graduate is observed in a place of residence from the registry *and* if one has positive wage earnings, paid any taxes, or received any transfer payments (social welfare benefit) during the year of interest (3rd year after graduation). Otherwise, we assume that person has left the country.[6]

Due to the binary nature of staying in Finland (yes/no), we developed a series of logistic regressions to estimate the probability of an international graduate staying after three years (dependent variable). We control for (independent variables) family ties (marriage, children, parents), labour market ties (employment), personal demographics (age, nationality[7], gender, earlier stay in Finland[8]), and characteristics of the degree programme and HEI (discipline, degree type, location). We estimated odds rations and marginal effects for the entire sample and marginal effects separately for each (three) degree type.

Findings

Table 1 introduces our sample of international students graduating in Finland between 1999 and 2011. Panel A displays all graduates (N = 10,273) and the share of those staying in Finland three years after graduation. We observed 74 per cent of bachelors, 67 per cent of masters, and 65 per cent of doctoral graduates residing in Finland three years after graduation. In Panel B (N = 7389),

Table 1. Graduates 1999–2011.

	Graduates by institution			Staying 3 years after graduation		
	Applied university	University – Master	University – Doctoral	Applied university	University – Master	University – doctoral
Panel A: All international students						
1999	44	204	75	0.73	0.54	0.55
2000	75	237	80	0.76	0.53	0.75
2001	123	228	85	0.77	0.56	0.65
2002	177	299	92	0.76	0.58	0.71
2003	211	267	103	0.75	0.65	0.56
2004	243	304	114	0.74	0.67	0.68
2005	318	324	125	0.75	0.71	0.66
2006	249	363	131	0.75	0.72	0.63
2007	288	386	134	0.80	0.67	0.66
2008	357	552	114	0.74	0.72	0.70
2009	407	535	160	0.73	0.70	0.70
2010	576	622	150	0.73	0.70	0.63
2011	637	728	156	0.73	0.69	0.58
Total	3705	5049	1519	0.74	0.67	0.65
Panel B: Those who did not live in Finland before enrolment						
1999	16	153	62	0.69	0.52	0.48
2000	36	181	51	0.64	0.49	0.69
2001	49	164	64	0.65	0.49	0.64
2002	84	228	71	0.64	0.56	0.68
2003	109	199	77	0.64	0.62	0.56
2004	135	224	85	0.64	0.64	0.62
2005	152	238	89	0.64	0.66	0.69
2006	158	295	101	0.66	0.70	0.56
2007	165	311	110	0.72	0.61	0.65
2008	226	420	90	0.67	0.70	0.69
2009	287	451	121	0.66	0.68	0.69
2010	415	503	105	0.68	0.68	0.64
2011	449	596	119	0.69	0.65	0.57
Total	2281	3963	1145	0.67	0.64	0.63
Panel C: Those who did not live in Finland before enrolment year and outside EU28						
1999	10	107	44	0.70	0.51	0.43
2000	24	125	35	0.58	0.51	0.69
2001	35	118	45	0.71	0.50	0.56
2002	68	157	47	0.66	0.56	0.72
2003	94	139	49	0.67	0.66	0.51
2004	107	145	57	0.61	0.68	0.67
2005	124	170	58	0.63	0.65	0.69
2006	128	189	59	0.66	0.71	0.58
2007	127	227	61	0.72	0.65	0.59
2008	191	312	56	0.69	0.69	0.73
2009	234	349	74	0.63	0.70	0.72
2010	381	398	63	0.68	0.67	0.63
2011	413	481	73	0.69	0.66	0.55
Total	1936	2917	721	0.67	0.65	0.62

we constrained our sample by excluding those who lived in Finland before enrolment. After we constrained our sample, the share of stayers' declined slightly as 67 per cent of bachelors, 64 per cent of masters, and 63 per cent of doctoral graduates were residing in Finland three years after graduation. In Panel C ($N = 5574$), we further constrained our sample excluding individuals from EU28 countries. We found the share of stayers' stayed roughly the same as in Panel B as 67 per cent of UAS, 65 per cent of masters, and 62 per cent of doctoral graduates were residing in Finland three years after graduation.

Table 2 presents our full sample logistic regression model results. It should be emphasised our explanatory (independent) variables are measured the year before graduation or earlier, and not

Table 2. Background factors and the decision to stay three years after graduation.

Dependent variable: 1 = Living in Finland, 0 = otherwise.		
	Odds ratio	Marginal effects
Enrolment age groups:		
−20	Ref. group	Ref. group
20–24	1.287 (0.107)***	0.050 (0.016)***
25–29	1.570 (0.146)***	0.089 (0.018)***
30–45	1.458 (0.154)***	0.074 (0.021)***
Male	0.927 (0.048)	−0.015 (0.101)
Married:		
Not married	Ref. group.	Ref. group.
Married to non-Finn.	1.316 (0.091)***	0.054(0.014)***
Married to Finn.	2.790 (0.210)***	0.203 (0.015)***
Has a child	2.109 (0.159)***	0.148 (0.015)***
Other family	3.437 (0.568)***	0.244 (0.032)***
Earlier stay in Finland	1.384 (0.091)***	0.064 (0.013)***
Employment:		
Not-employed	Ref. group.	Ref. group.
Employed	1.966 (0.126)***	0.134 (0.013)***
Employed in white collar job	2.127 (0.146)***	0.149 (0.014)***
Completed degree by institution:		
University – master	Ref. group.	Ref. group.
Applied university	1.192 (0.069)***	0.035 (0.011)***
University – doctoral	0.555 (0.042)***	−0.116 (0.015)***
Graduation region:		
Capital region	Ref. group.	Ref. group.
Large city regions	1.102 (0.076)	0.020 (0.015)
Other regions	1.524 (0.086)***	0.083 (0.011)***
Field of education:		
Social science, Business and law	Ref. group.	Ref. group.
Education	0.873 (0.166)	−0.027 (0.037)
Humanities and art	1.016 (0.084)	0.003 (0.016)
Science	1.526 (0.142)***	0.083 (0.018)***
Technical	1.302 (0.084)***	0.052 (0.013)***
Health and welfare	1.449 (0.114)***	0.073 (0.016)***
Other	1.073 (0.123)	0.013 (0.023)
Region of origin:		
EU-28	Ref. group.	Ref. group.
Other Europe and Turkey	1.630 (0.121)***	0.096 (0.015)***
Asia	0.794 (0.051)***	−0.046 (0.013)***
Africa	1.064 (0.091)	0.012 (0.017)
Other	0.919 (0.102)	−0.017 (0.022)
Average predicted probability	0.693	0.693
Pseudo likelihood	−5646	−4062
Pseudo R^2	0.109	0.113
Observations	10,273	10,273

Note: Model includes also graduation year dummies to account for business cycle (and other) variation. Significance *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors in parentheses.

after graduation. Results suggest family ties and labour market opportunities increased the probability international graduates stay in Finland. All three family ties variables, marriage, having children (15 per cent) and other family living in Finland (24 per cent) increased the probability to stay. Compared to non-married graduates, those married to a Finnish spouse had a higher increased probability to stay (20 per cent) than those married to a non-Finnish spouse (five per cent). Employed international graduates had 13 per cent increased probability to stay than those who were unemployed. Examining employment more closely, our results suggest those who worked in a white-collar job (subgroup of employed) had slightly higher probability to stay (15 per cent).

Exploring graduates' decision to stay in Finland further, we estimated marginal effects by degree type (Table 3). This provides more clarity on where the marginal effects exist by revealing the heterogeneity that was not clear from the aggregated (whole sample) results presented in Table 2. First with family ties, marriage to a non-Finnish spouse showed increased probability to stay for only

Table 3. Background factors & decision to stay three years after graduation by institution (Marginal effects).

Dependent variable: 1 = Living in Finland, 0 = otherwise			
	Applied university	University – Master	University – Doctor
Enrolment age groups:			
−20	Ref. group.	Ref. group.	Ref. group.
20–24	0.033 (0.018)*	0.029 (0.026)	−0.223 (0.173)
25–29	0.118 (0.024)***	0.045 (0.029)	−0.248 (0.172)
30–45	0.140 (0.029)***	0.028 (0.034)	−0.305 (0.173)*
Male	0.013 (0.018)	−0.027 (0.015)*	−0.047 (0.028)*
Married:			
Not married	Ref. group.	Ref. group.	Ref. group.
Married to non-Finn.	0.022 (0.019)	0.079 (0.023)***	0.062 (0.032)*
Married to Finn.	0.140 (0.019)***	0.245 (0.025)***	0.238 (0.040)***
Has a child	0.128 (0.024)***	0.152 (0.024)***	0.143 (0.031)***
Other family	0.242 (0.040)***	0.222 (0.050)***	0.337 (0.161)**
Earlier stay in Finland	0.021 (0.018)	0.098 (0.020)***	0.055 (0.033)**
Employment:			
Not-employed	Ref. group.	Ref. group.	Ref. group.
Employed	0.099 (0.016)***	0.164 (0.021)***	0.153 (0.042)***
Employed in white collar job	0.145 (0.023)***	0.159 (0.021)***	0.151 (0.034)***
Graduation region:			
Capital region	Ref. group.	Ref. group.	Ref. group.
Large city regions	0.015 (0.022)	0.024 (0.024)	0.036 (0.032)
Other regions	0.038 (0.016)**	0.154 (0.019)***	0.101 (0.031)***
Field of education:			
Social science, Business and law	Ref. group.	Ref. group.	Ref. group.
Education	−0.068 (0.171)	−0.039 (0.051)	0.028 (0.165)
Humanities and art	−0.005 (0.037)	−0.007 (0.025)	0.036 (0.058)
Science	…	0.161 (0.027)***	−0.076 (0.043)*
Technical	0.039 (0.016)**	0.058 (0.021)***	0.029 (0.043)
Health and welfare	0.112 (0.022)***	0.017 (0.028)	−0.031 (0.050)
Other	−0.021 (0.027)	0.041 (0.039)	0.014 (0.071)
Region of origin:			
EU-28	Ref. group.	Ref. group.	Ref. group.
Other Europe and Turkey	0.107(0.025)***	0.076 (0.024)***	0.084 (0.039)
Asia	−0.044 (0.020)**	−0.052 (0.020)**	0.012 (0.034)
Africa	0.020 (0.023)	−0.082 (0.030)***	0.052 (0.050)
Other	−0.032 (0.038)	0.004 (0.031)	−0.072 (0.063)
Average predicted probability	0.744	0.689	0.648
Log likelihood	−1773	−2869	−887
Pseudo R^2	0.157	0.105	0.099
Observations	3705	5049	1519

Note: Model includes also graduation year dummies to account for business cycle (and other) variation. Significance *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors in parentheses.

master's graduates (eight per cent) and doctoral graduates (six per cent) while marriage to a Finnish spouse showed increased probability of staying for all degree types. Having children or other family in Finland had similar positive patterns across all degree types; point estimates were close to the aggregated results presented earlier.

Second, estimates for labour market ties showed differences across degree types. For bachelors graduates on average, white-collar employment (15 per cent) related to increased probability to stay than just employment (10 per cent). For masters and doctoral graduates, employment and white-collar employment increased the probability to stay roughly the same (15–16 per cent) compared to those unemployed (reference group). Third, estimates for the location of the HEI showed differences across the three regions. Across all degree types, graduates from HEIs located in the other region related to a higher probability of staying.

Panel A of Table 4 reports the marginal effects for interactions among a few explanatory variables. By themselves, masters and doctoral graduates had a decreased probability of staying in Finland than bachelors graduates. However, when interacted with employment, we found all degree types associated with an increased probability to stay. White-collar employment had higher increased

Table 4. Selected background factors with interactions (Marginal effects).

Dependent variable: 1 = Living in Finland, 0 = otherwise	
Panel A:Institution and employment	
Institution	
Applied university	Ref.
University – Master	−0.033 (0.012)***
University – Doctor	−0.140 (0.017)***
Employment	
Not employed	Ref.
Employed	0.127 (0.012)***
Employed in white collar job	0.147 (0.012)***
Conditional: Applied university	
Employed	0.113 (0.015)***
Employed in white collar job	0.158 (0.019)***
Conditional: University – Master	
Employed	0.123 (0.017)***
Employed in white collar job	0.148 (0.017)***
Conditional: University – Doctor	
Employed	0.178 (0.033)***
Employed in white collar job	0.117 (0.028)***
Panel B:Marital status and employment	
Marital status	
Not married	Ref.
Married to non-Finn.	0.048 (0.014)***
Married to Finn.	0.176 (0.011)***
Employment	
Not employed	Ref.
Employed	0.127 (0.014)***
Employed in white collar job	0.138 (0.012)***
Conditional: Not married	
Employed	0.139 (0.016)***
Employed in white collar job	0.145 (0.017)***
Conditional: Married to non-Finn.	
Employed	0.145 (0.025)***
Employed in white collar job	0.179 (0.024)***
Conditional: Married to Finn.	
Employed	0.082 (0.018)***
Employed in white collar job	0.083 (0.018)***
Number of observations	10,273
Average predicted rate	0.693

Note: Logistic estimations in panel a and b include interaction terms. For other variables, see Table 2.

probability of staying than just having employment, for bachelors and masters graduates; for doctoral graduates though, white-collar employment related to a smaller increased probability to stay than just employment.

In panel B of Table 4, we display interactions for marital status and employment. Employment and white-collar employment predicted similar increases in probability of staying (13–14 per cent), but when interacted with marriage, differences arose. For international graduates who were non-married, we observed no large differences between employment (14 per cent) and white-collar employment (15 per cent). Estimates were also close to same magnitude for graduates married to a non-Finnish spouse (15–18 per cent increase). However, for international graduates married to a Finnish spouse, employment before graduation seemed to play a smaller role explaining the decision to stay in Finland (eight per cent increase).

Discussion

The findings show a high stay rate (RQ1) of international graduates (over 62 per cent) for all degree types and controlling for living in Finland previously. A recent study from the Centre for International Mobility (CIMO 2016) found a stay rate of 72 per cent three years after graduation for

international graduates from 2009 in Finland. While CIMO's (2016) stay rate is higher than this study's, we note CIMO's definition of international student and methodology is different. The CIMO (2016) study did not constrain its sample and included international graduates who completed secondary education in Finland or have Finnish or Swedish as their first language. Additionally, this study placed students into 13 graduating cohorts (based on date of highest degree completed) while the CIMO study examined graduates from only 2009. Lastly, our definition of 'staying' required activity in one the national databases (e.g. employment, transfer payments, etc.) which the CIMO study did not. We believe these differences account for the variation in the stay rates.

Regardless of methodology, it is clear that the stay rate in Finland is high; these rates are higher than similarly framed studies in Denmark (58 per cent two years after graduation; Ministry of Higher Education and Science 2018), Norway (44 per cent five years after degree start; Tran 2014), and Netherlands (38 per cent four years after graduation; EP-Nuffic and Blaauwberg 2016). However, the number (13,056, initial sample) of international graduates in Finland over 13 years (cohorts), is not very large. For example, the Dutch study (EP-Nuffic and Blaauwberg 2016) had over 7350 international graduates in a single year. In short, even though the stay rate is very high in Finland, it is still relatively small in number compared to other European countries. Comparing this study to studies outside Europe, Finn and Pennington (2018) found slightly higher stay rates (70 per cent five years after graduation) in the United States for foreign doctoral students. Demirci (2019) found similar results to this study on STEM graduates in the United States having higher stay rates at the bachelors and masters levels but differing results at the doctoral level (2.1 per cent increase for STEM, this study had no significance or 7.5 per cent decrease depending on specific field of STEM).

A number of countries have relaxed their immigration policies or faced 'losing out' to other countries with more flexible immigration options (Robertson 2013). Finland is emblematic of this as Finland's government, since 2001, enacted numerous policies aimed to attract, retain, and integrate international students into Finland (Jokila, Kallo, and Mikkilä-Erdmann 2019). Two main reasons cited for this focus in Finnish policy is to improve the reputation and prestige of Finnish institutions, through increased internationality, and increasing the available skilled labour for the labour market (Jokila, Kallo, and Mikkilä-Erdmann 2019). In 2018 the Finnish government expanded beyond the European Union's (EU) directive governing international student residence and work permit (minimum nine months after graduation) to search for employment to 24-months with a possible extension to 48-months (Ministry of Interior 2018).

In 2013 the Finnish government published 'government resolution on the future of migration 2020 strategy' (2020 Strategy) stating it recognises that 'international students are important resource for the Finnish labour market' (Ministry of Interior 2013, 14). Throughout the 2020 Strategy document there is an avocation of policy supporting migrants and international students connecting and integrating into Finnish society and labour market. The belief is if migrants (international students) find a role for themselves in the Finnish labour market, then there is a reduction in inequality and migrants feel they are contributing members of Finnish society (Ministry of Interior 2013).

The second research question (RQ2) examined factors relating to increasing or decreasing the probability of staying in Finland three years after graduation. We use ISM suggesting family ties and labour market opportunities influence the decision to stay in host country after graduation to guide our modelling and analysis. In general, we found evidence (Tables 2, 3, 4) of family ties and labour market opportunities increasing the probability to stay in Finland regardless of degree type.

With family ties specifically, having children (13–15 per cent), having at least one parent (other family) residing in Finland (22–34 per cent), and marriage (in multiple forms, five to 20 per cent) related to higher probability of staying. This is in-line with EU-wide research showing the more migrants (student or otherwise) are rooted (family and housing) to a location the higher probability they were to stay regardless of employment situation (European Commission 2018, 39). Choosing to migrate is not a choice made in isolation. Often families (parents, spouses, children) are directly and

indirectly apart of the process. That all family ties findings were positive while controlling for employment, demographic, and the characteristics of the degree programme and HEIs in our model suggests Finland is attractive for international graduates staying for family reasons.

There is multiple of pieces of evidence to support this as Finland ranks as one of the best countries in the world to raise a family; high levels of safety and quality of primary and secondary schools (UNICEF 2016), high levels of gender equality (European Institute for Gender Equality 2018), and recognition as the happiest country (2018 and 2019; Helliwell, Layard, and Sachs 2019). This is notable as previous research found Finland also being a challenging place for migrants and international students to live due to racism (European Union agency for fundamental rights 2018) and difficulty of learning the Finnish language (Foreign Service Institute ND; Korhonen 2015).

With employment opportunities, employment and white-collar employment, a subset of employment, were similar in size (increase probability, 15–16 per cent, to stay compared to unemployed) across degree types except for bachelors employment (only 10 per cent). This finding coupled with employment and degree type interactions (Table 4, panel A) indicating white-collar employment likely had a stronger effect on staying for bachelors graduates; suggesting job quality mattered for bachelors graduates in terms of staying in Finland while for other degree types it did not.

The employment findings are particularly noteworthy as previous research shows Finland being a difficult place to find employment for international students, before and after graduation (Alho 2020, Korhonen 2015; Ministry of Interior 2013). The main barriers identified are Finnish language skills and networks (professional and personal). Finland has the highest share of degree programmes offerings in English of any non-English speaking European country (Wächter and Maiworm 2014, 40). The Finnish government (Jokila, Kallo, and Mikkilä-Erdmann 2019; Ministry of Interior 2013) has acknowledged the issue of lack of Finnish language skills of international graduates and has continuously advocated for Finnish language skills for international students during their studies. However most HEIS and degree programmes have difficulty fitting Finnish language studies in a curriculum with limited space (ECTS). The Finnish situation is one of instruction is one language (English), while the labour market is another (Finnish and Swedish). While being trained (educated) in Finland is still likely a positive for international students entering the Finnish labour market, the difference in the languages of instruction and labour market likely lowers the positive affect it would have if both were the same.

In 2017, the Ministry of Economic Affairs and Employment (Työ-ja Elinkeinoministeriö 2017) reported Finnish employers often apply informal ways of recruiting. In many ways, Finland has a 'hidden' job market; a job market in which international students are at a disadvantage in finding employment due to their 'weak' professional network ties (Alho 2020). Despite being highly desirable by governments, recruitment of international students into local and national labour markets require context-bound knowledge and embeddedness into that culture (Alho 2020). As such, and coupled with our finding our model's positive employment finding, it suggests it is beneficial for international students, as well the Finnish government and HEIs, to invest time and resources in enhancing international students ability to develop professional networks and acquiring Finnish language skills.

Lastly, the findings on the characteristics of the degree programme and HEI, controlled for in the model, leads to additional observations. In general, bachelors graduates had higher probability to stay than masters and doctoral graduates. A likely explanation is UAS degrees, by nature, are more applied and focused on getting graduates employed into the Finnish labour market than masters and doctoral degree programmes (CIMO 2016). As for the location of the institution, we found graduates from other regions were more likely to stay when compared to other graduates from large city or the capital region. The HEIs in the other regions of Finland operate in relatively small towns (populations under 150,000) and have a climate where temperatures below −20C in winter are common. For an international student choosing to attend an HEI in this region might represent a higher predisposition to staying in Finland prior to enrolling. On the other hand, perhaps the capital and large city HEIs' graduates are able or more often look to compete in wider labour markets (i.e. not just in Finland).

Conclusion

In the last few decades, international higher education has shifted paradigms in a policy context from a diplomatic project to an import/export industry (Robertson 2013). It has become very market driven and grounded in a neo-liberal framework. Countries developed their international education policies differently, and largely did so as response to a global competitive environment with countries 'racing' to obtain larger shares of the international student market (Robertson 2013, 40). While the number of interested stakeholders paying attention to the retention of international graduates is increasing (EP Nuffic and Blaauwberg 2016), it is simultaneously broadening the definition of internationalisation of higher education and labour markets. National economies are becoming increasingly intertwined and interdependent and as such, educating and retaining international students with competencies and transferable skills for a wide range of labour markets is critical (OECD 2016). Finland, like other countries, needs to be attractive to migrants not only for higher education rationales, but also for long-term economic growth.

The original questions posed concerned understanding the relation of family ties and labour market opportunities to international students staying in Finland after graduation. The decision to stay in a host country by international graduates is complex and the findings in this research highlight a few key takeaways. First, evidence suggests family and labour market ties relate to the probability of international graduates staying in country across all degree types. Additionally (Table 4 panel B), there appears direct linkages (and interactions) among family ties, labour market ties, and stay rates. While ISM is a relatively new theoretical framework, from an application of theory perspective our findings suggest ISM worked well in explaining why international students stayed after graduation in Finland and would be useful in future students examining international student migration and mobility.

Second, our models found most family ties and employment variables increased the probability of staying of international graduates across all degree types. OECD countries are increasingly competing for international students often to compliment domestic supply of skilled workers and as replacements for an ageing workforce (Hawthorne 2018). We do note a limitation on the estimated effect of family ties and employment status on staying as they might not be equal to the magnitude of the causal effect. As these variables were captured prior to graduation, these variables might only partially capture the effect of the unobserved motivation to stay in Finland after graduation. Ideally we would need an exogenous change in employment or family status of students to capture the magnitude of the causal effect. Despite this limitation, these findings suggest countries looking to increase stay rates of international students should examine policies focused on improving the employment opportunities and family situations of international students within their context. This includes examining the services available to international students from social welfare (health care, schools, family services) to employment training (language acquisition, networking services).

While there is a need for continuing research on international graduates' stay rates, the evidence from this study provides clear evidence for the direction of policy for countries looking to increase their stay rates. Even in a country (Finland) with documented difficulties for international students to enter its labour markets (Ahlo 2020; Korhonen 2015; Ministry of Interior 2013), our models found employment and family ties, in multiple forms, relating to increased retention of international students after graduation. This suggests countries interested in increasing international students' stay rates develop policies aiming to enhance the family life and ability of international students to enter their labour markets.

Notes

1. There have been a number of mergers between institutions in Finland since 1999. The number of institutions listed for each sector reflects the current structure. Graduates from merged institutions count in the new institution's numbers.

2. There are some international students without a Finnish personal identity code (variety of reasons) recorded in official educational registries when graduating. To increase identification of international students staying, we investigated individual graduates with foreign nationality and no matching Finnish identify code in other national data registries (residence, employment, etc.) via names and birthdates.
3. Students admitted into a university's undergraduate programmes in Finnish automatically receive study rights to both the bachelor's and master's degrees.
4. For robustness, we also estimated our main specifications using a sample where we do not focus only on highest completed degrees. This specification change increases our sample size to 11,150 observations but has no real effect on our results or conclusions. These results are available from the authors upon request.
5. When migrating from Finland, individuals are supposed to inform local registry office. If an individual departs without informing officials, it is possible that the last place of residence shows in the registry for an extended period; showing them, falsely, still residing in Finland. As the national registries are managed by a single entity (Statistics Finland) and highly connected, this method of including activity, was deemed more accurate in identifying individuals who stayed.
6. For robustness check, we evaluated how our results differ if we use only the place of residence as an indicator of migration behaviour. Results were similar to chosen method, inclusion of activity, but as the chosen identification method was deemed more accurate – see footnote 5 – we went with this identification method in the analysis.
7. Due to regulations on data use from Statistics Finland, we were required to group student's nationalities to continent, see appendix for distributions.
8. Individuals identified as "earlier stay in Finland" if they were living in Finland prior to starting their higher education studies but also did not complete their secondary education in Finland. This was to capture individuals whose first reason to come to Finland was not directly related to higher education studies. There are a variety of reasons for this with the most common being trailing spouse/partner and starting studies after working in Finland.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

This work was supported by Academy of Finland [grant number 310508].

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Appendix

Descriptive statistics for ALL graduates (see Table 2, $N = 10{,}273$)

Variable	Explanation	% share
Enrolment age groups:	1 = Belongs to this group, otherwise = 0	
20	1 = Belongs to this group, …	0.09
20–24	1 = Belongs to this group, …	0.40
25–29	1 = Belongs to this group, …	0.31
30–45	1 = Belongs to this group, …	0.20
Male	1 = Male, …	0.53
Married:		
Not married	1 = Not married (Finnish registry).	0.61
Married to non-Finn.	1 = Married to non-Finn living in Finland.	0.18
Married to Finn.	1 = Married to Finn.	0.21
Has a child	1 = At least one child in Finland.	0.23
Other family	1 = Has mom/dad (or both) living in Finland.	0.05
Earlier stay in Finland	1 = Lived in Finland year prior enrolment.	0.28
Employment:		
Not-employed	1 = Not employed in year end.	0.53
Employed	1 = Employed in year end.	0.47
Employed in white collar job	1 = White collar job in year end.	0.23
Graduation region:		
Capital region	1 = If from Helsinki region (NUTS2).	0.39
Large city regions	1 = If from Turku-Tampere regions (NUTS2).	0.16
Other regions	1 = If from other NUTS2 regions.	0.45
Field of education:		
Education	1 = If graduates from this faculty.	0.02
Humanities and art	1 = If graduates from this faculty.	0.12
Social science, Business and law	1 = If graduates from this faculty.	0.27
Science	1 = If graduates from this faculty.	0.09
Technical	1 = If graduates from this faculty.	0.30
Health and welfare	1 = If graduates from this faculty.	0.15
Other	1 = If graduates from this faculty.	0.05
Region of origin:		
EU-28	1 = If from this region.	0.25
Other Europe and Turkey	1 = If from this region.	0.21
Asia	1 = If from this region.	0.32
Africa	1 = If from this region.	0.15
Other	1 = If from this region.	0.06

Note: Time variant explanatory variables measured one year before graduation year if not stated otherwise.