Covid-19 and intentions to study abroad: evidence from overseas university applications to the UK

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Abstract

Purpose – The purpose of this study is to investigate how Covid-19 impacted overseas students' decision to apply for an undergraduate degree at UK universities.

Design/methodology/approach – This study compares the number of university applications from overseas students in summer and autumn 2020 with those in the period 2011–2019. Multivariate analysis techniques are used.

Findings – The results show that the pandemic has led to a drop in university applications from foreign students by 11–14%. Such decline has been driven by a reduction in the number of applicants from high-income countries as opposed to those from middle-lower income countries. Two explanations may account for this finding. First, students from affluent countries, compared to those from poorer countries, may be more likely to find a good alternative to the UK where to carry out their studies (including their home country). Second, the option of deferring study abroad plans due to the pandemic may be more affordable for applicants from high-income countries.

Originality/value – While understanding how Covid-19 has impacted international student mobility is an emerging issue in the literature, not only are there few studies providing evidence on this, but these are based on qualitative analysis. This paper uses quantitative methods that allow to separate the effect of Covid-19 from that associated with other factors affecting the flow of international students.

Keywords Covid-19, University applications, International students, UK

Paper type Research paper

1. Introduction

The Covid-19 pandemic has significantly affected the globalisation of higher education. The closure of university campuses around the world and international travel restrictions have made students rethink their plans to study abroad. Some of them have cancelled or deferred their study abroad plans, while others have continued with them given also the possibility to attend courses online. Virtual learning could have also made international education more attractive to individuals who normally would not consider this option. Evidence from Ireland (McCrave, 2020) and Poland (Polish Press Agency, 2020) suggests that Covid-19 has led to a drop in international student numbers. On the other hand, the academic year 2020–2021 has seen a 13% surge in international admissions to Swedish universities despite the pandemic (Myklebust, 2020a).

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This study investigates how Covid-19 impacted overseas students' decision to apply for an undergraduate degree at UK universities. It compares the number of university applications from overseas students in summer and autumn 2020 with those in the period 2011–2019 while controlling for a number of factors that are expected to have affected the flow of international students into the UK during these years. An important advantage of looking at applications rather than enrolment is that the former, in contrast to the latter, is not subject to supply-side capacity constraints and hence it enables to capture how the pandemic has affected students' intentions to study abroad.

The UK is the second most popular study abroad destination in the world and the first one in Europe. According to Higher Education Statistical Agency's data, in the academic year 2018–2019, foreign students accounted for 17% of all students enrolled in full-time UK undergraduate courses. Understanding the consequences of Covid-19 on international students in the UK is of paramount importance not only in light of their significant contribution to the university sector (Dolton, 2020), but also because they constitute a valuable source of educated labour. A relatively large proportion of foreign students in STEM (science, technology, engineering, mathematics) and business programmes stay and work in the UK after graduation (MAC, 2018), thereby helping the economy to grow.

The remainder of this study is set out as follows. Section 2 examines more in detail how the Covid-19 pandemic may affect international student mobility. Section 3 discusses the dependent and explanatory variables included in the model and describes the estimated equation. Section 4 reports the empirical results. Section 5 concludes this article.

2. International student mobility and Covid-19

Several arguments suggest that the Covid-19 pandemic may have a detrimental effect on international student mobility.

The economic crisis induced by the coronavirus outbreak may have two relevant implications. First, it may imply a reduction in personal and public funds to finance study abroad. Second, assuming that it will take a few years for the global economy to fully recover from the pandemic, post-graduation labour market prospects may still be relatively poor at that time, thereby leading to a decline in the expected return on investment on study abroad.

Students may be less willing to move abroad because of travel restrictions and difficulties in getting visas (Yıldırım *et al.*, 2021). Many countries have temporarily closed their national borders in an attempt to reduce the spread of the virus (Buckner *et al.*, 2022). Visa restrictions have been placed on individuals from countries hit especially hard by Covid-19. Additionally, there is evidence that in several countries the processing of visa and permit applications for study purposes has experienced significant delays given that many consulates and administrative services have closed or reduced their usual capacity due to Covid-19 (European Commission, 2020).

Prospective international students are also concerned about their health and well-being status. They are worried about the possibility of catching the virus while abroad because they will be alone and may be unfamiliar with the local health system. For example, according to a survey conducted by the British Council among over 10,000 Chinese students, a large proportion of respondents considered "personal safety" (87%) and "health and well-being" (79%) as their major concerns when thinking about the possibility to study abroad (Durnin, 2020). This result is consistent with that of Cheng and Agyeiwaah (2022) who investigate the concerns of 16 Chinese students who planned to study abroad during the Covid-19 pandemic. Health-related risks are found to play a role in the study abroad decision-making of the students and their parents. Stewart and Kim (2021) also highlight the importance of studying in a safe place in the Covid-19 era. They look at the experiences of ten exchange students at a university in Seoul and find that Korea was perceived by them as a safe destination.

Even though a large number of universities around the world have decided to offer online courses to international students in order to avoid travel, visa and health issues, virtual mobility may not confer the same benefits as physical mobility. For instance, virtual international students miss out important social and cultural elements of a study abroad experience including living in a foreign country, enjoying the social life on campus and becoming familiar with other cultures. The results of a survey among EU students studying in the UK show that one of the main reasons behind their decision to study abroad was to broaden their horizons or experience other cultures (West *et al.*, 2000). Additionally, given that studying abroad is typically more expensive than studying at home, many parents may no longer be willing to invest in the former as they expect that their children will be less engaged online than they would be in the classroom (Enriquez, 2020). This argument is supported by evidence showing that students often feel that online learning is not as effective as traditional face-to-face teaching (Tratnik *et al.*, 2019).

On the other hand, however, virtual international mobility is associated with several important advantages. The most important one is that it may enable more students to get exposure to international education. Many students eager to study abroad cannot afford travel and other costs associated with living in a foreign country. Virtual international mobility also offers the chance to study at a foreign university to individuals who traditionally have not had access to such an opportunity given their inability to leave their home country because of family or employment reasons. In the recent past, international education has counted on a growing demand driven by more and more students entering higher education who are increasingly interested in gaining a greater understanding of the world. Kemp (2020) reports that the number of international degree-seeking students increased at a possible rate of approximately 4% per year during the last 50 years. Additionally, although online learning cannot replace the campus experience, a virtual learning environment allows students to engage in cross-border collaborations, thereby developing and improving intercultural understanding and global mindedness.

3. The model

3.1 The dependent variable

All students, including the international ones, apply for an undergraduate university place in the UK through the Universities and Colleges Admissions Service (UCAS). From 2008, applicants, regardless of their domicile, are able to make up to five choices about where and what they would like to study. UCAS then passes the applications to the universities for consideration. Universities decide whether or not to make an offer based on the submitted application form, but they may also invite applicants for an interview before making a decision.

During each year, there are three key UCAS deadlines for undergraduate courses:

(1) 15 January – This deadline is for applications from EU students.

(2) 30 June – This deadline is for applications from international students.

(3) 15 October – This deadline is only for applications to most medicine, dentistry, veterinary medicine/science courses, as well as all courses at the universities of Oxford and Cambridge.

While the first two deadlines are for courses starting in September of the same year the application is submitted, the third deadline is for courses beginning in September of the next year. However, the 15 January deadline is flexible, meaning that higher education institutions may continue to accept applications from EU students until 30 June or until all places are filled up.

In this study, the dependent variable of our model is the number of UCAS undergraduate applications by country received by the 30 June and 15 October deadlines during the years between 2011 and 2020. Our objective is to compare June 2020 applications with June applications received in the years from 2011 to 2019. A similar analysis is carried out with October applications. The January deadline is not considered as January 2020 applications are unlikely to have been affected by Covid-19. Data on UCAS undergraduate applications are available from its website (https://www.ucas.com/).

Table 1 provides the distribution of June and October applications by applicant's country of domicile (87 different countries are considered) between 2011 and 2020. China dominates, accounting for about 12% of the total number of applications [1]. A significant proportion of applications come from other Asian countries including Hong Kong, Singapore and India. France, Germany, Italy and Ireland are the countries where most European applications come from. Interestingly, the USA accounts for a much higher proportion of October applications than June applications.

3.2 The explanatory factors

In the analysis, we include a number of factors that may influence overseas students' intentions to study abroad.

(1) GDP per capita of applicant's country of domicile

This is a proxy for applicant's financial ability to pay for all the (direct and indirect) costs associated with studying abroad (Naidoo, 2007). Data on GDP per capita come from the International Monetary Fund (IMF).

(2) Population size of applicant's country of domicile

Countries with larger population are expected to send more students to study abroad (Bessey, 2012). The data source for population size is the IMF.

(3) Real GDP growth rate of applicant's country of domicile

In addition to GDP per capita, real GDP growth rate captures an important dimension of the economic situation in the applicant's country of origin (Shen, 1999). While students in countries that are experiencing an economic crisis may be more inclined to study abroad, those living in countries enjoying an economic boom may be more reluctant to do so. Individuals living in an economy that is growing fast may feel less the need to have access to foreign job markets in the future, which is one of the benefits of studying abroad. Data on real GDP growth rate come from the IMF.

(4) Colonial linkage

Individuals willing to study abroad who are from countries that were linked to the UK through a colonial tie may be especially likely to move to this country. These students may have preferential access to scholarships offered by the UK government or other UK public or private bodies (Abbot and Silles, 2016). It is also possible that students from these former colonies are particularly knowledgeable about the UK given the strong commercial, cultural and social links between their home country and the UK. Wei (2013) finds that strong trade relations can facilitate the flow of international students. Student mobility from former colonies may also be supported through the large migrant population from these countries in the UK. Those migrants may provide assistance and information to students, thereby reducing their migration costs (Beine *et al.*, 2014). We use a dummy variable that takes the value of 1 if the applicant's country of domicile is a member of the Commonwealth, and 0 otherwise.

Country	Number of applications June	Number of applications October	% of total applications June	% of total applications October
Albania	940	140	0.08	0.08
Armenia	500	170	0.04	0.10
Australia	5,530	2,740	0.50	1.54
Austria	5,870	1,450	0.53	0.81
Azerbaijan	2,210	110	0.20	0.06
Bahrain	3,720	410	0.33	0.23
Bangladesh	3,180	460	0.29	0.26
Barbados	870	150	0.08	0.08
Belgium	10,150	1,920	0.91	1.08
Botswana	1,480	230	0.13	0.13
Brazil	2,690	460	0.24	0.26
Bulgaria	22,680	1,630	2.04	0.91
Cameroon	820	100	0.07	0.06
Canada	23,110	6,420	2.08	3.60
China	138,400	21,000	12.45	11.77
Colombia	850	100	0.08	0.06
Croatia	2,350	270	0.21	0.15
Cyprus	31,220	2,100	2.81	1.18
Czech Republic	8,500	1,120	0.76	0.63
Denmark	4,810	980	0.43	0.55
Egypt	6,310	750	0.57	0.42
Estonia	4,850	380	0.44	0.21
Finland	8,630	970	0.78	0.54
France	47,040	5,850	4.23	3.28
Germany	33,500	7,040	3.01	3.94
Ghana	3,220	310	0.29	0.17
Greece	23,670	2,020	2.13	1.13
Hong Kong	59,770	12,160	5.38	6.81
Hungary	8,260	1,610	0.74	0.90
India	47,190	7,720	4.24	4.33
Indonesia	5,800	1,090	0.52	0.61
Iran	3,330	500	0.30	0.28
Ireland	52,630	6,890	4.73	3.86
Israel	1,260	280	0.11	0.16
Italy	38,840	6,290	3.49	3.52
Jamaica	840	130	0.08	0.07
Japan	4,970	800	0.45	0.45
Jordan	4,320	630	0.39	0.35
Kazakhstan	3,340	240	0.30	0.13
Kenya	7,010	670	0.63	0.38
Korea, Republic of	14,930	3,350	1.34	1.88
Kuwait	5,810	1,110	0.52	0.62
Latvia	6,360	320	0.57	0.18
Lebanon	3,030	350	0.27	0.20
Lithuania	21,080	1,120	1.90	0.63
Luxembourg	4,220	720	0.38	0.40
Macao	2,060	270	0.19	0.15
Malaysia	47,440	8,270	4.27	4.63
Malta	1,170	150	0.11	0.08
Mauritius	4,030	690	0.36	0.39
Mexico	1,860	270	0.17	0.15
Morocco	3,290	290	0.30	0.16
Nepal	1,060	110	0.10	0.06

(*continued*)

Table 1. Distribution of applications by applicant's country of domicile, 2011–2020

Country	Number of applications June	Number of applications October	% of total applications June	% of total applications October
Netherlands	8,730	2,090	0.79	1.17
New Zealand	1,740	920	0.16	0.52
Nigeria	19,190	1,420	1.73	0.80
North Macedonia	450	130	0.04	0.07
Norway	17,840	1,540	1.60	0.86
Oman	3,050	280	0.27	0.16
Philippines	1,500	240	0.13	0.13
Poland	32,280	5,360	2.90	3.00
Portugal	14,670	1,130	1.32	0.63
Qatar	4,880	470	0.44	0.26
Romania	30,160	3,280	2.71	1.84
Russian Federation	9,420	1,140	0.85	0.64
Saudi Arabia	10,590	1,030	0.95	0.58
Serbia	1,090	370	0.10	0.21
Singapore	37,140	13,170	3.34	7.38
Slovakia	6,960	880	0.63	0.49
Slovenia	1,410	340	0.13	0.19
South Africa	4,680	660	0.42	0.37
Spain	30,080	4,040	2.17	2.26
Sri Lanka	3,240	720	0.29	0.40
Sweden	13,970	2,410	1.26	1.35
Switzerland	12,090	2,230	1.09	1.25
Taiwan	3,930	610	0.35	0.34
Tanzania	1,650	150	0.15	0.08
Thailand	8,100	1,530	0.73	0.86
Trinidad and Tobago	1,820	530	0.16	0.30
Turkey	8,340	1,130	0.75	0.63
Uganda	1,780	130	0.16	0.07
Ukraine	2,490	280	0.22	0.16
United Arab Emirates	16,280	2,830	1.46	1.59
United States of America	40,100	11,020	3.61	6.17
Vietnam	5,080	650	0.46	0.36
Zambia	1,520	130	0.14	0.07
Zimbabwe	4,540	320	0.41	0.18

Table 1.

(5) Common language

Students from countries whose official language is (or whose official languages include) English may be eager to study in the UK because of a common language. Sharing the same language can be perceived as reducing the costs of studying abroad since it may involve less monetary expenses (e.g. language training) and less "psychic" costs (e.g., anxiety) (Lee and Tan, 1984). We employ a dummy variable that takes the value of 1 if English is an official language of the applicant's country of domicile, and 0 otherwise.

(6) Tuition fees

Yang and Wang (2016) show that there is a negative relationship between tuition fees and international student inflow. In the UK, tuition fees are higher for international students than for home students. While, in addition to UK citizens, nationals from EU/EEA countries and Switzerland used to be included in the category of home students, this is no longer the case for courses starting from 1 August 2021 as a result of Brexit. Information about tuition fees for the forthcoming academic year is typically available for prospective international students at

the moment of their application and, even if this is unavailable, the current tuition fee level, which is publicly accessible, is a good proxy for the expected tuition fees (Soo and Elliot, 2010). Data on average tuition fees for home and international students are from Reddin Survey of Tuition Fees. Average tuition fees across all UK universities (excluding Oxford and Cambridge universities) are used in the model for June applications, whereas average tuition fees across Oxford and Cambridge universities are employed in the equation for October applications.

Table 2 provides summary statistics for the explanatory variables employed in this study.

3.3 The estimated equation

Following Soo and Elliot (2010) and Chevalier and Jia (2016) who estimate a model where the dependent variable is the number of university applications, we employ a log-linear function. Specifically, our main estimated equation is as follows:

$$\log(y_{it}) = \beta_0 + \beta_1 COVID19_t + \beta_2' X_{1it} + \beta_3' X_{2i} + \beta_4 P_{it(+1)} + \beta_5 P_{it(+1)}^2 + \alpha_i + t + \varepsilon_{it} \quad (1)$$

where y_{it} is the number of (June or October) applications by students from country i in year t; α_i is the country-fixed effects; $COVID19$ is a dummy variable that takes the value of 1 if applications were made in 2020, and 0 otherwise; X_{1it} is a vector of country time-varying variables that includes GDP per capita, real GDP growth rate and population; X_{2i} is a vector of country time-invariant variables that includes the dummy for colonial ties and the dummy for English as an official language; $P_{it(+1)}$ is the tuition fees charged to prospective students (in the model for October applications we use the tuition fees that are charged next year given that, as stated earlier, prospective students will begin their studies at that time [2]); t is a linear time trend to capture the general upward trend in international student numbers over time; the βs are parameters to be estimated; ε_{it} is a random error term. In line with the approach of Soo and Elliot (2010), a tuition fees squared term is included to account for the possible non-linear relationship between tuition fees and applications. Country-fixed effects account for time-invariant country features that may affect students' demand to study abroad. For instance, geographical distance to the UK does not vary over time and serves as a proxy for travel costs (Rodríguez González *et al.*, 2011).

The main parameter of interest, β_1, tests whether there is a difference in the average number of applications by overseas students between the Covid-19 period and the pre-Covid-19 period. It is also worth to note that the inclusion of tuition fees among the explanatory factors of the model is expected to play a key role in accounting for the effect of Brexit on international student mobility. As stated earlier, one of the effects of Brexit is that EU/EEA and Swiss nationals starting a course from 1 August 2021 must pay international student fees [3]. This is very important when modelling the October applications since EU/EEA and Swiss

	Mean	S.D.
Covid-19	0.100	0.300
Tuition fees (in UK pounds) – June applications	11,131.38	2,923.209
Tuition fees (in UK pounds) – October applications	19,127.76	8,159.804
Population (in millions)	68.279	204.707
GDP per capita (in US dollars)	23,322.27	23,832.87
Real GDP growth rate (annual percentage change)	2.1	4.553
English as an official language	0.264	0.441
Colonial ties	0.253	0.435
No. of observations	870	870

Table 2. Summary statistics of the explanatory variables, 2011–2020

students who applied for a UK university place in October 2020 will be the first ones experiencing the increase in tuition fees. Although the substantial increase in tuition fees is the main channel through which Brexit may negatively affect applications from EU/EEA and Swiss students, there are other factors associated with this situation that may also potentially decrease the demand to study in the UK. First, EU/EEA and Swiss nationals no longer can benefit from student loans accessed by British students. Second, they would need to apply for the UK's new Graduate Route to stay in the country and work, or look for work, for two years after graduation. Third, the psychological implications of Brexit need to be considered. Some prospective students may be reluctant to study in a country where they feel that migrants are no longer welcomed or where there is uncertainty about their ability to remain following the completion of their studies (Amuedo-Dorantes and Romiti, 2021).

Equation (1) is estimated using Ordinary Least Squares. Standard errors are clustered at country level to control for heteroskedasticity and within-country correlation in the error term.

Our analysis is essentially a before–after investigation [4].

4. Empirical results

In Table 3, we present results for two different specifications of the model. Columns (1) and (3) report estimates for a baseline specification where, in addition to a constant and country-fixed effects, only the dummy for Covid-19, a linear time trend as well as tuition fees and its squared term are included. Results for the full specification are shown in Columns (2) and (4). Additionally, Columns (1) and (2) show the outcomes for June applications whereas Columns (3) and (4) depict the findings for October applications. *F*-test results confirm the appropriateness of the inclusion of country-fixed effects in all the regressions. As reported at the bottom of Table 3, country-fixed effects are always highly statistically significant. In line with expectations, the estimated coefficient on the linear time trend is positive and statistically significant in all the regressions. Additionally, the fit of our regressions is very good with an R^2 of about 0.97, indicating that our model is suitable for analysing the pattern of overseas university applications.

In line with expectations, more applications are likely to come from countries with a larger population. Furthermore, a higher real GDP growth rate in the country of origin is found to deter students from considering studying abroad. On the other hand, we find that GDP per capita is not related to the number of applications. The relevant estimated coefficient has not the expected sign and is not statistically significant. As noted by Bessey (2012), this result may be explained by the existence of grants and scholarships that help students from less affluent countries to pay for the costs of studying abroad.

As expected, the existence of a common official language is associated with a higher number of applications. On the other hand, other things being equal, it is found that applications from Commonwealth countries are lower than those from non-Commonwealth countries. This unexpected result can be attributed to the close correlation between the dummies for English as an official language and colonial ties. If the former is excluded from the model, the coefficient on the latter turns out to be positive and statistically significant. In other words, our result would seem to indicate that applicants from Commonwealth countries are less likely to apply for a university place in the UK after accounting for the fact that English is likely to be the official language (or one of the official languages) of their country of origin.

Soo and Elliot (2010) find that higher tuition fees deter students from applying to study abroad up to a certain level, after which applications start to increase. They suggest that a possible explanation for this outcome is that very high levels of tuition fees may be perceived by prospective students as a signal of quality. Results from Columns (3) and (4) support the

	Log (applications)			
	June		October	
Explanatory variables	(1)	(2)	(3)	(4)
Constant	4.811*** (0.316)	4.867*** (0.328)	3.332*** (0.231)	3.242*** (0.223)
Covid-19	−0.065** (0.026)	−0.117*** (0.034)	−0.149** (0.072)	−0.153** (0.073)
Tuition fees	−0.00006* (0.00004)	−0.0001 (0.00004)	−0.0001*** (0.00003)	−0.00007*** (0.00002)
$(\text{Tuition fees})^2$	0.000000001 (0.000000002)	0.000000004 (0.000000002)	0.000000002*** (0.000000001)	0.000000002** (0.000000001)
Population		0.006*** (0.002)		0.008*** (0.003)
GDP per capita		−0.000003 (0.000004)		−0.000005 (0.000005)
Real GDP growth rate		−0.006* (0.003)		−0.006*** (0.002)
English as an official language		1.519*** (0.031)		0.781*** (0.037)
Colonial ties		−1.094*** (0.006)		−0.965*** (0.008)
Time trend	0.050** (0.024)	0.051** (0.024)	0.029*** (0.007)	0.029*** (0.007)
Country dummies	Yes 34,899.74 (0.000)	Yes 16,524.92 (0.000)	Yes 250,000 (0.000)	Yes 72,503.75 (0.000)
F-statistic (p-value)				
R^2	0.9735	0.9742	0.9691	0.9705
No. of observations	870	870	870	870

Note(s): Standard errors, clustered at country level, are in brackets. ***, ** and * denote significance at the 1, 5 and 10% levels, respectively

Table 3.
Effect of Covid-19 on overseas university applications – main results

existence of such a non-linear relationship between tuition fees and applications, whereas the estimated coefficients on tuition fees and its squared term have the expected signs but are not statistically significant in Columns (1) and (2) [5].

Moving on to the variable of primary interest, the results consistently show that the Covid-19 period is associated with a reduction in the number of overseas applications. The size of such reduction is larger in the full specification for both June and October applications [6]. Specifically, according to the estimates reported in Columns (2) and (4), in 2020 the number of applications fell by approximately 11% (i.e. exp(−0.117)−1) and 14% (i.e. exp(−0.153)−1), respectively, compared to the period from 2011 to 2019. It is important to note that Brexit does not appear to have confounded the effects associated with Covid-19 reported in Columns (3) and (4). Although not shown here, results from the model for October applications where only students from EU/EEA countries and Switzerland are included show that the coefficient on the Covid-19 dummy is negative but not statistically significant. Tuition fees appear to pick up the detrimental effect exerted by Brexit on applications from prospective students from EU/EEA countries and Switzerland. The exclusion of tuition fees and its squared term from the full specification of the model for October applications for this group of students results in an estimated coefficient on the Covid-19 dummy that is negative and highly statistically significant.

Next, we look at the effect of Covid-19 on the number of applications by applicant's continent of domicile (Oceania has been excluded because there are only two countries belonging to this continent in our sample). Three main results emerge from Table 4. First, Covid-19 led to a drop in June and October applications from prospective students in America. Second, 2020 saw a statistically significant decline in the number of June applications from Europe. The estimated coefficient on the Covid-19 dummy in the equation for October applications from Europe has a negative sign but is not statistically significant at conventional levels. Third, the number of African applicants who applied by the October deadline turns out to be greater in 2020 than in the period from 2011 to 2019.

Finally, in Table 5, we investigate whether the effect of Covid-19 varies depending on the average income of the applicant's country of domicile. We follow the classification made by the World Bank based on Gross National Income (GNI) per capita in 2019. World countries are split into four different groups: high-income countries (whose GNI per capita was $12,536 or more), upper-middle-income countries (whose GNI per capita was between $4,046 and $12,535), lower-middle-income countries (whose GNI per capita was between

	Log (June applications)			
	Asia	Africa	Europe	America
Covid-19	−0.056 (0.043)	0.027 (0.149)	−0.126** (0.060)	−0.170** (0.061)
No. of observations	310	130	350	80
	Log (October applications)			
	Asia	Africa	Europe	America
Covid-19	0.087 (0.090)	0.546** (0.249)	−0.227 (0.177)	−0.418** (0.133)
No. of observations	310	130	350	80

Table 4.
Effect of Covid-19 on overseas university applications by applicant's continent

Note(s): Turkey and Russian Federation are included both in Asia and Europe. In addition to a constant and country-fixed effects, the model specification includes a linear time trend, a dummy for English as an official language, a dummy for colonial ties, population, real GDP growth rate, GDP per capita, a dummy for EU membership (only for Europe), tuition fees and its squared term. Standard errors, clustered at country level, are reported in brackets. ***, ** and * denote significance at the 1, 5 and 10% levels, respectively

	High-income countries	Log (June applications) Upper-middle-income countries	Lower-middle-income countries
Covid-19	−0.121** (0.047)	−0.259*** (0.071)	−0.046 (0.105)
No. of observations	480	220	160
		Log (October applications)	
	High-income countries	Upper-middle-income countries	Lower-middle-income countries
Covid-19	−0.302** (0.123)	−0.008 (0.125)	0.250 (0.177)
No. of observations	480	220	160

Note(s): In addition to a constant and country-fixed effects, the model specification includes a linear time trend, a dummy for English as an official language, a dummy for colonial ties, population, real GDP growth rate, GDP per capita, tuition fees and its squared term. Standard errors, clustered at country level, are in brackets. ***, ** and * denote significance at the 1, 5 and 10% levels, respectively

Table 5.
Effect of Covid-19 on overseas university applications by applicant country's income level

$1,036 and $4,045) and low-income countries (whose GNI per capita was $1,035 or less). However, we cannot consider the last group of countries in our analysis given that in our sample there is only one country (i.e., Uganda) belonging to it. The estimates consistently indicate that in 2020 there has been a decline in applications from prospective students from high-income countries, whereas no statistically significant effect is observed in lower-middle-income countries. It is possible that students from affluent countries, in contrast to students from poorer countries, have found in their home country a good alternative where to carry out their studies. Evidence from Norway, a country traditionally characterised by a relatively large proportion of study abroad students (Wiers-Jenssen and Try, 2005; Sin *et al.*, 2021), would seem to support this hypothesis. In Norway, in autumn 2020, the number of university applications rose by 8.7% compared to 2019, and this increase was driven by domestic students (Myklebust, 2020b). Applications to the top two Norwegian universities in the 2020 Academic Ranking of World Universities (i.e., University of Olso and NTNU – The Norwegian University of Science and Technology) have experienced a particularly significant increase. Something similar may be occurring in richer Asian countries where, due to the pandemic, prospective international students are considering studying in a neighbouring country rather than selecting traditional study abroad destinations like the USA or the UK (Mok *et al.*, 2021). Additionally, students from poorer countries may be less eager than those from rich countries to postpone their study abroad plans because of Covid-19. Many of the former students are likely to heavily rely on grants or scholarships that may not be deferred. Several UK higher education institutions (e.g., University of Southampton and University of Exeter), through their web pages, warn prospective students that, despite the pandemic, it may not be possible to transfer their scholarship to the next academic year. Additionally, given their difficult economic situation, applicants from less developed countries may not be able to afford to delay their entry into the graduate labour market. A few studies (see, for instance, Lee, 2010) argue that young people from disadvantaged backgrounds who aspire to higher education are often willing to start their university studies as soon as they can because they need to enter the workforce early. Jayadeva (2020) finds that, despite the pandemic, many prospective Indian postgraduate students are not willing to reconsider their plans to study in Germany. They do not have good alternative plans and feel that competition for places at German universities is likely to

become fiercer in the future given that a large number of applicants are likely to have chosen to postpone their study abroad plans due to Covid-19.

5. Conclusions

Covid-19 has caused a huge disruption in the higher education sector. The spread of the virus has led to the closure of university buildings and the adoption of virtual learning environments. International education has been badly hit by the pandemic due to cross-border travel restrictions and difficulties in getting student visas. Furthermore, students increasingly recognise the importance of health and safety issues when deciding whether or not to study abroad. Universities around the world have responded to these problems by making online courses accessible also to overseas students. Studying abroad remotely has some disadvantages (e.g., missing out the real campus experience), but also some benefits (e.g., no travel costs and no expenses related to living abroad).

This work has empirically investigated the influence of Covid-19 on overseas students' decision to apply to UK universities. The number of undergraduate overseas applications submitted in autumn and summer 2020 has been compared with those received in the period 2011–2019. Applications from students of 87 different countries around the world have been considered. In the analysis, we have controlled for several determinants of international student mobility including tuition fees, colonial ties and common language among others.

The estimates indicate that the pandemic has led to a fall in university applications from foreign students by between 11 and 14%. It is important to observe that this result does not appear to be driven by Brexit. Brexit is not expected to have negatively affected the undergraduate applications made by EU, EEA or Swiss nationals in June 2020 as this was the last instance in which they were considered "home students". Moreover, while EU, EEA or Swiss students who applied in October 2020 will be the first ones experiencing a substantial increase in tuition fees as a result of Brexit, our estimates show that Covid-19 is not associated with a statistically significant reduction in the number of applications submitted by them after controlling for the increased cost of attending university.

Finally, our estimates suggest that while the Covid-19 outbreak has considerably reduced university applications from high-income countries, this has not occurred with lower-middle-income countries. It is possible that students from the former group of countries are more likely to find a good alternative to the UK where to carry out their studies compared to those from the latter group of countries. In affluent countries, the pandemic could have caused students initially interested in studying abroad to divert their choice to the domestic market, attracted also by the presence of good universities. One should also note that students from high-income countries are more likely to afford the option of deferring their study abroad plans. Not only are many students from poorer countries likely to heavily rely on grants or scholarships that may not be deferred, but they may also be reluctant to delay their entry into the graduate labour market given their economic situation.

Notes

1. In a recent paper, Sato (2022) shows that the number of Chinese students studying in the UK has significantly increased between 1999 and 2017.
2. The 2021 tuition fees are computed as a linear extrapolation of past tuition fees for international students.
3. England, Scotland and Wales have all confirmed that EU students who start a course from the 2021–2022 academic year will no longer have home fee status. However, Irish students living in Northern

Ireland will be treated the same as UK students for fees due to the UK–Ireland Common Travel Area agreement.

4. One limitation of this methodology is that it may also pick up the effect of other factors (e.g., unobservable or difficult-to-observe factors related to Brexit) that have coincidentally occurred at the same time as the pandemic and that have also affected students' intentions to study in the UK. There might also be specific factors related to applicant's country of domicile. For instance, in Hong Kong, it is possible that the number of students submitting their applications to UK universities has increased in 2020 because of many young people from Hong Kong finding refuge in the UK following the fallout of the 2019 Social Movement and the social and political changes in the territory.
5. In Column (1) of Table 3, the coefficient on tuition fees is statistically significant at the 10% level.
6. However, the difference between the coefficients on the Covid-19 dummy variable reported in Columns (3) and (4) of Table 3 is not statistically different from zero.

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