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The Impact of the University Reputation on Tuition Fees for International Students and on International Student Investment in the Country's Economy

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ABSTRACT

Objective: Establishing the impact of the university reputation on tuition fees for international students and on international student investment in the country's economy.

Methods: Correlation and regression analyses at university and country level between leading world rankings (QS, THE, ARWU, Webometrics) and the cost of international students studying in them, as well as quantifying the contribution of international student investment to the economies of 16 countries.

Results: For 11 countries around the world, each with more than 15 universities, the correlation between the integral indicators of the university rankings in QS, THE, ARWU and Webometrics rankings and the tuition fees at these universities for bachelor's and master's programs was calculated. The results show that the best correlation was found for the anglophone countries that have a liberal pricing policy for students. Based on statistics from national and international organizations over an eight-year-time interval (2011 – 2018), the share of income that a country receives from foreign students staying in it in relation to foreign direct investment was calculated for 16 countries of the world. This share of income varied, in general, from tenths of a percent to 50%. For identified universities from QS and THE rankings of the countries under consideration their Average Overall (Total) Score was calculated and their correlations with average tuition fees were made.

Conclusion: It is concluded that international student recruiting in many countries is a matter of survival of their universities as well as the territories where these universities are located. That is why it is a matter of material welfare of the territories where universities are located.

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Introduction

The world has been enthusiastic about different rankings for a long time. The best-known journal on scientometrics similarly named "*Scientometrics*" published an article by De White Kristof and Lenka Hudrlikova (2013) that starts with the words "People like rankings. They like to rank sportsmen, the most expensive properties or the fastest computers." According to R. Frank and P. Cook, the winner in this ranking race takes it all ("The winner-take-all society") (Frank, Cook, 1995).

Understandably, this love of rankings was bound to touch upon universities to which the principles indicated above also apply (Ehrenburg, 2000; Marginson, 1997). Despite the persistent criticism of the world university rankings (Marginson, 2007; Saisana, D'Hombres & Saltelli, 2011) they became influential tools long ago. They come into play when decisions in academic sphere are taken and have a serious impact on the structure of academic institutions (Hazelkorn, 2007, 2008). They grow in numbers and are used as guides by politicians (Salmi, 2009), employers (Tofallis, 2012; Wut, Xu & Lee, 2022), recruiters (Harvey, 2008; Obermeit, 2012), students (Clarke, 2007; Obermeit, 2012; Cebolla-Boado, Hu & Soysal, 2018; Dearden, Grewal & Lilien, 2019; Tajpour, Demiryurek & Abaci, 2021; Wut, Xu & Lee, 2022) and by university management teams, of course (Hazelkorn, 2007; Salmi, 2009).

The first world university rankings appeared in China in 2003 (ARWU, 2003) and in the U.K. a year later (THE, QS, 2004). The latter two rankings have indicators of higher education internationalization. They are international faculty ratio and international student ratio.

Historically, the internationalization of education started over fifty years ago when prestigious American and British colleges started to set up international programs to enhance international and cross-cultural opportunities for students including education abroad, improvement of foreign language teaching, scholarships for international students to study at American universities (Siaya, Yayward, 2003; Sinuany – Stern, 2019).

Even before the epoch of global university reputation race international student market grew dramatically for two decades from 0.6 mln students in 1975 to 2.9 mln students in 2006 (OECD, 2008; Marconi, Ritzen, 2015). According to the latest data, in 2020, there were 4.4 million international students enrolled in the OECD, accounting for on average 10% of all tertiary students. The most important receiving countries are the United States (U.S.) (22% of all international students), the United Kingdom (U.K.) (13%) and Australia (10%). While the destinations of international students have diversified over the past decade, the main origin countries remain China and India (22% and 10% of all international students, respectively) (OECD, 2022).

Notably, only the U.S. economy received $12 bln from international students (Davis, 2003), with the figure growing to $35.8 bln in 2015 (Sinuany – Stern, 2019). In the OECD as a whole, direct export revenues from international students increased in nominal terms from over EUR 50 bln in 2010 to over EUR 110 bln in 2019. These education-related services exports include the direct contribution of international students to the host country's economy during studies for tuition, food, accommodation, local transport, and other services (OECD, 2022).

Browsing the British THE and QS sites shows that almost all the content especially advertising and promotion are targeted at students. The efforts of ranking agencies form the future students view about the necessity to choose the university according to the rankings and according to the information imposed by the ranking agencies because the ranking agencies directly connect their rankings with the quality of education and the level of research in the universities ranked by them. Naturally, the choice of the university is influenced by other factors as well including the opinion of parents and friends who study at the university. However, the reputation of the university defined by rankings is crucial. For example, Y.N. Soysal, R.D. Baltary and Cebolla-Boado (2022) based on a sample of 88 British universities found that the reputation of the university is the main factor boosting the numbers of international students (the correlation coefficient between these parameters was 0.605 according to one of the models).

The rankings are considered the measure of education quality and contribution into the aggregated level of human capital (Hanushek & Woessmann, 2012) although this position, which does not deny the fact that the rankings increase competition between universities, face strong criticism (De Witter & Hudrlikova, 2013; Marginson, 2007; Taylor & Braddock, 2007; van Raan, 2005; van Vught, 2010). This is the reason why politicians and university leaders take measures to have their universities ranked higher and higher. They understand that these efforts require allocation of large resources. The resources allow to attract the best students and professors, to buy cutting-edge research equipment, which, in its turn, is converted into better positioning in the world university rankings (Shin & Kim, 2013; Marconi & Ritzen, 2015).

The work by G. Marconi and J. Ritzen (2015) studies correlation between university position in the world rankings and expenditure per student in TOP 200 universities in THE in 2007. However, it raises the issue of effective use of resources as their ineffective deployment may not give results. As the paper by G. Marconi and J. Ritzen (2015) shows, generally, in the best universities in the world a 1 % increase in the expenditure per student improves the THE position by 4-9 %. In other words, the authors of the work argue that the elasticity of 4-9 % means that the university improves its position in the THE rankings by one place as a result of raising its expenditure per student by 3-7%.

Knowing that for many prospective students, university reputation plays a key role, university management raises tuition fees if the university improves its ranking even without taking actions

to enhance the quality of education. Students know it as well because they perfectly understand that big companies readily employ prestigious university graduates and pay higher salaries to them. P. Ramsden (1999) described this effect thirty years ago. Accordingly, higher university ranking attracts better students and the general level of students at the university improves (De Witte, Hudrlikova, 2013).

Student fees can act as a signal of the quality of education, particularly in the countries with a positive reputation. In such cases, higher fees tend to attract international students (OECD, 2022). On the other hand, those countries and universities that already attract high numbers of international students, predominantly English-speaking OECD countries, can afford to charge high fees based on their popularity (Beine, Noël, Ragot, 2014). Charging tuition fees allows universities to maintain a constant funding stream, which, in turn, allows them to improve their educational rankings, increase prestige and research output, and subsidize the cost of enrolling additional domestic students (Chen, 2021).

In 2011 Australian Education International conducted a survey of 1,330 students from China, India, Indonesia, Korea, Thailand and Vietnam that showed the following ranking of the quality of education system: 1. the U.S., 2. the U.K., 3. Australia. The main findings of the survey were that quality of education, tuition and living costs were the most important factors influencing where potential students choose to study (Lawson, 2011). Drawing on this research, R. Soeharto and D. S. Kodrat (2015) concluded that institution rank is usually affected by its research quality, and normally universities with higher rank will also have higher tuition fees.

Apart from the university reputation race that fuels tuition fees increase, there are economic reasons for tuition fees growth in many countries. It is true that countries cannot finance higher education as they did before and they stimulate the increase of tuition fees for international students (Armbruster, 2008; Carter, Curry, 2011; Ferra, et al., 2017). That is why recruiting international students in many countries of the world presents an existential challenge to their universities and not only to the universities but to the territories where they are located as well. On top of tuition fees, students must spend the same amount of money if not more on accommodation, food, services, thereby investing in the local economy.

The paper by Farhan (2014) uses the case of three Canadian universities (Research Intensive University, Comprehensive University, Teaching Intensive University) to thoroughly study the issue of how university rankings influence enrolment. Thus, a 1 % increase in the tuition fees for international students raises enrolment by 0.92 % in the first two categories of universities and by 0.11 % in the teaching intensive universities. In the rest of the cases, including the increase in the cost of international students, the values of this indicator are negative. It is also shown that international-national student's ratio, which is one of the most important indicators in the British university rankings, grows 0.97% with similar increase in the cost of international students. In the

work, there is also an important conclusion that international students may be a driving force in promoting universities in the world university rankings to more extent than education costs (Farhan, 2014).

Earlier research by M. Coelli (2009) demonstrates that the increase in the tuition fees reduces enrolment among people with low income and boosts enrolment among people from the middle and upper classes. Now we are moving on to the review of literature where we find proofs of correlation between the quality of education (or position in the university rankings) and tuition fees. The paper by E. Canton and H. Vossenstyen (2001) studies 62 public universities and 40 private universities in the U.S. They differentiate tuition fees for undergraduate and graduate students and for international and domestic students within these categories. Educational quality is valued according to the U.S. News quality-indicator, which is one of the indicators used by this American university rankings company. The data concerning this indicator were gathered for 1993 and 1996. We sorted the data from the tables presented in the article and compiled Table 1 with the data concerning the coefficient of determination.

Table 1. The coefficient of determination between education quality and tuition fees in the U.S.

	Undergraduate students	Graduate students
In-state/Public	0.18	0.16
In-state/Private	0.12	0.21
Out-of-state/Public	0.44	0.41
Out-of-state/Private	0.12	0.20

Table 1 shows the best correlation between the quality of education and tuition fees for international students at the U.S. public universities. The paper by D. F. McDuff (2007) presents more recent data concerning the quality of education (U.S. News & World Report (2000)) and tuition fees (2000 IPEDS database) in the American universities and colleges. It demonstrates positive Pearson correlation of 0.3 between these indicators without differentiation between students or higher education institutions as it was done in the article previously described. The paper shows that the US states with higher quality of education attract more students with SAT and ACT score reports despite higher tuition fees in these states.

The earlier mentioned paper by De Witte and Hudrlikova (2013) proposes nonparametric methodology to rank universities with the use of the BoD (Benefit of the Doubt) model (Mclyn, Moesen, 1991). In this model, indicators are assigned weights that are used to calculate the composite index. Indicators according to which a university has more competitive advantages are more heavily weighted. The weights are calculated as an optimization linear programming problem. To do calculation experiments in three versions of the BoD model the paper analyses TOP 200 universities from the QS rankings in 2009. With the nonparametric test the authors show that tuition fees for undergraduate and postgraduate students, high research status of the university, teaching in English raise the position of universities in BoD rankings. At the same

time tuition fees for domestic students and the size of the university do not facilitate improvement of positions in the rankings. The paper contains a significant conclusion that traditional rankings with fixed weighting schemes mostly reward large and research-oriented universities (De Witte, Hudrlikova, 2013).

The paper by A. C. Tsikliras, D. Robinson and K. I. Stergiou (2014) uses the case of 45 British universities from THE-2012 to show that there is nonlinear regression correlation between overseas tuition fees and education contracts (in thousand pounds) and THE ranks: $y = 1E+06x^{-1.064}$ (R^2 =0.48) as well as linear correlation between European tuition fees and education contracts and THE ranks: $y = -0.0005x+41.987$ (R^2=0.38).

More recent data on correlation between tuition fees and university scores are found in Working paper by O. Berne (2020). He derived for the Top 100, 80, 60, 40 and 20 universities in the ARWU 2017 the average tuition fees in universities: Top 20 - 34.7; Top 40 – 25.4; Top 60 – 20.4; Top 80 – 18.1; Top 100 – 16.8 thousand dollars. The data show high correlation between tuition fees and ARWU scores

We also found three Russian papers that study correlation between tuition fees and ranks of universities. The work by K. Tatochenko and A. Tatochenko (2013) studies QS-2012 ranks and tuition fees of 25 US universities, 16 British universities, 19 Australian universities, 16 Canadian universities and 15 Japanese universities. As tuition fees in all the universities except the U.S. are regulated by the state, correlation between the indicators in question is found only for the US universities. For them Pearson correlation coefficient equals 0.7. In their other work K. Tatochenko and A. Tatochenko (2014) stated strong correlation between scores of the Russian universities in “Expert RA” rankings in 2012 and tuition fees. Initially 90 universities were divided into 7 groups with different numbers of universities in them. Mean values of scores and tuition fees were calculated for each group as well as correlation between these indicators. Pearson correlation coefficient equals 0.86.

The paper by I. B. Stukalov and A. A. Stukalov (2016) presents small sample of the Russian universities; that is why such correlation is not found. However, the authors state that the quality of education services is associated by consumers and customers with the university rank. They also note that there is a nonlinear relation between the fees and the position of the university in rankings.

Let us now turn to existing research into international students’ investment in the country’s economy or to what is known as the economic impact of international students. In spite of the growing importance of international comparative studies into economic impact of international students such research works are scarce (OECD, 2022). According to OECD International Migration Outlook evidence from France and Germany, the two main destination countries for

international students in continental Europe, is limited to only one dated study per country, conducted in 2013 and 2014.

A study conducted by the National Association of Foreign Student Advisors (NAFSA) concludes that foreign students help to create 455,000 jobs and contribute $39 billion in the US economy (The Hindu Businessline, 2018). From 2013 to 2019 the export income generated from international students studying in Australia rose steadily each year with 17.5 in 2013 to a total of 37.6 billion Australian dollars in 2019. Chinese students made up the largest group of international students in this year (Statista Research Department, 2019).

English-speaking OECD countries, including the U.S., Australia, the U.K., Canada and New Zealand, rank as the top five countries by gross revenues, accounting for more than 80% of the total revenues from the exports of education-related services in the OECD area in 2019. The figures for the U.S. and Canada have more than tripled over the past decade, while Australia, New Zealand, and the U.K. saw a twofold increase (OECD, 2022).

As OECD (2022) report does not provide information about Germany, we turn to the figures given by R. Paneru (2019), who used the data on the number of international students till 2018 and their expenses to make a forecast of international students' expenses for 2019. According to his forecast these expenses amounted to € 3 billion. These expenses do not include the use of flight service to and from Germany. Neither do they include the money spent by these students for their vacation in and outside Germany (Paneru, 2019).

Comparison of gross values of exports of education-related services with total exports shows that the English-speaking OECD countries show the highest shares, and all recorded increases over the past decade. In Australia, the share increased from 6% to 8.5%, and, in New Zealand, from 4% to 5%. Canada, the U.K. and the U.S. have seen their shares of education-related services increase to 2% of their total exports (OECD, 2022).

As a result of this literature review, we can raise the following research questions:

1. In addition to the sporadic research works reviewed above the question arises whether there is correlation between university ranks and tuition fees for international students in larger quantity of counties and world university rankings.
2. What is the share of student foreign investment in direct foreign investment, export and GDP in a country? How does it change from country to country?
3. Is there correlation between mean value of the rank, that is aggregated for all the universities in the country, and the average tuition fee for international students in the country?

Materials and Methods

The first part of our research is based on the data from Unipage website from which in May 2020 we downloaded the data concerning tuition fees in the first 550 universities that are TOP-550 universities in Webometrics Ranking. The date of the rankings was not stated on the site. These universities were grouped according to countries and QS, THE, ARWU rankings for 2018-2019 as well as initial Webometrics Ranking. We selected countries with more than 15 universities with single value of Overall (Total) Score in the British and Shanghai rankings (universities with interval values of these indicators were left out of our calculations). For universities grouped in such a way according to four rankings we received from Unipage website tuition fees for undergraduate and graduate students. After that we calculated correlation between tuition fees and Overall (Total) Score as well as ranks of the universities in Webometrics Ranking. Initial data for the correlation analysis of QS and THE rankings are given in Appendix 1 and 2.

In the second part of the research, data for 16 countries were gathered from different national and international organizations to calculate the share of income from international students in the entire volume of foreign direct investment in these countries. The data concern the volume of foreign direct investment, the number of international students, average tuition fees, other expenses of international students in the receiving country (Appendix 3). Besides, we calculated shares of income from international students in the country export and GDP using World Integrated Trade Solution (WITS) website.

Results and discussion

In QS 2018-2019 rankings we identified five countries with more than 15 universities. For these universities we found Pearson correlation between Total Score of these universities in this ranking and tuition fees for undergraduate and graduate students (in US dollars). The data about tuition fees were taken from Unipage website. The dynamics of this correlation from high to low was in the following order: the U.S. – the U.K. – Australia – China. It means that the highest correlation is found in the three most liberal anglophone countries where university tuition fees are only lightly regulated by the government. The correlation does not exist and even has slightly negative coefficient for Japan as in this country tuition fees are strictly controlled by the government and are almost the same in different universities regardless their position in the rankings (Table 2).

We identified three countries that have more than 15 universities in THE 2018-2019 rankings. In comparison with the previous calculations' similar correlations for the U.S. and the U.K. are slightly lower. Negative correlation is found for Germany (Table 2). Only the U.S. has more than 15 universities in ARWU 2019 rankings. It is explained by the fact that exact values of the Total Score are given only for TOP-100. Correlation coefficients for this country are similar to those in

THE rankings. In all three rankings correlation coefficients between tuition fees for undergraduate and postgraduate programs are very high. In addition, we calculated similar Pearson correlation coefficients for TOP 100 ARWU 2017 ranking and 48 U.S. universities in these rankings using the unique data provided by O. Berne (2020) who managed to collect tuition fees data from sites of 98 out of 100 universities. The values of correlation coefficients are 0.43 and 0.36, respectively.

Table 2. Pearson correlation between scores in different rankings and tuition fees for undergraduate and graduate students in the different countries of the world

Ranking	Country	Correlation between the score and tuition fees for undergraduate students	Correlation between the score and tuition fees for graduate students	Number of universities (N)
QS 2018-2019	the U.K.	0.726527	0.792291	34
	the U.S.	0.654006	0.620841	75
	Australia	0.453767	0.548555	20
	China	0.302339	0.143389	21
	Japan	-0.1166	-0.13248	16
THE 2018-2019	the U.S.	0.607145	0.59543294	60
	the U.K.	0.517645	0.54764	28
	Germany	-0.42855	-0.2279	21
ARWU 2019	the U.S.	0.624498	0.581919	42
Webometrics Ranking 2020	Russia	0.661974	0.085269	18
	Australia	0.599918708	0.730384761	30
	the U.K.	0.522581	0.561153	73
	the U.S.	0.471802368	0.50794004	186
	South Korea	0.38693544	0.55125001	16
	France	0.204216	0.179858	49
	China	0.14484717	0.20310955	26
	Brazil	0.050565	0.05433	21
	Italy	-0.1064	-0.2074	24
	Germany	-0.326265	-0.29473414	45
	Japan	-0.3586477	-0.1033357	38

Note: For Webometrics Ranking Unipage ranks (May 2020) presumably corresponding to the data of January 2020 were used instead of scores.

We performed analysis of correlation between ranks in Webometrics Ranking and tuition fees for undergraduate and graduate students in the different countries of the world according to the data given on Unipage in May 2020. These calculations were done with the use of Pearson correlation. We took the maximum rank N_{max} for each country and assigned it to the first university in Webometrics Ranking. N_{max}-1 was assigned to the second university, N_{max}-2 was assigned to the third university and so on. Rank 1 was assigned to the last university. These ranks were placed in correspondence with tuition fees (Appendix 1). Calculations of Pearson coefficient is shown in Table 2.

There are 11 countries that have more than 15 universities in Webometrics Ranking (Table 2). The table shows that Australia has rather high values of Pearson correlation. It is followed by the U.K., the U.S. and South Korea. The rest of the countries have very low correlation values between ranks in Webometrics Ranking and tuition fees for undergraduate and graduate students, with some of them having negative correlation values.

The comparison of the data from Table 2 shows that the U.S. have similar values of correlation coefficients for ARWU, QS and THE rankings that vary in the interval of (0.61, 0.65) for undergraduate students and (0.58, 0.62) for graduate students, respectively. In Webometrics Ranking these values are 20 % lower, which is explained by a big number of American universities in this ranking (N=186). Many of them are in the low band of rankings, which affects correlation for the US leading universities in ARWU, QS and THE rankings. It is notable that this situation does not influence the ranks of the British universities in THE (N=28, R=0.52; 0.55) and Webometrics (N = 73, R = 0.52;0.56). The same universities have correlation coefficients higher than 0.7 in QS ranking.

China has low correlation coefficients (0.14 – 0.30) in QS and Webometrics Ranking, Australia has moderate correlation coefficients in QS (0.45; 0.55) and relatively high ones in Webometrics (0.60; 0.73). In these rankings, Japan's correlation coefficients are negative as well as Germany’s ones in THE and Webometrics.

In general, countries whose universities enter several rankings (the U.S., the U.K., China, Australia, Japan, Germany) have similar correlation coefficients.

To understand why there are no positive correlations between tuition fees and university scores (ranks) for Germany and Italy and why there is weak positive correlation for France we provide the following facts and explanations.

For a long time, international students in Germany were not charged tuition fees. When tuition fees for international students were imposed, they were set by federal states.

After the abolition of the ban on tuition fees by the Federal Constitutional Court in January 2005, the 8 out of 16 German States introduced fees for the student ranging from 300 Euros to 500 Euros per semester (Demange, Fenge, & Uebelmesser, 2008). In this country, throughout the years 2006-2014, 7 out of the 16 federal states introduced a fee only to repeal it soon thereafter (Zullo and Churkina, 2021).

R. Paneru (2019) states that before 2015 neither Germany nor France had tuition fees for foreign students. As for Italy, recent evidence from Italian universities shows a robust and negative effect of fees on international student intake (Beine, Delogu and Ragot, 2020).

Accordingly, relatively recent introduction of state-controlled tuition fees for foreign students in Germany, Italy and France could not lead to market equilibrium between tuition fees and university reputation revealed in the rankings, i. e. it could not result in positive correlation between these indicators. The values for non-anglophone countries are shown in Table 2.

As for Brazil, the correlation under discussion is not found for this country in Table 2 because its universities are not presented in at least TOP-200 QS, THE, ARWU and Webometrics Ranking. In fact, the best Brazilian University – University of Sao Paulo – occupied the following positions in the rankings: 115 (QS 2023), 201–250 (THE 2023), 101-150 (ARWU 2022) and 72 (Webometrics July 2022).

It should be assumed that international graduate students focus on university rankings more than graduate students. This suggests that correlation coefficients between university scores and tuition fees must be higher for students enrolling in graduate programs (Master and PhD levels). According to Table 2, this suggestion is valid for all University Rankings of the British and Australian universities and, in addition, for the universities of the U.S., China and South Korea in Webometrics Ranking.

The highest values of correlation coefficient in Table 2 for anglophone countries may be explained by the fact that in these countries a large proportion of international students study for Master's and Doctor's degrees. As we noted above, students in these programs are more guided by university rankings. Thus, the number of students in Master's and Doctor's programs amounts to 50% and 33% in Australia, 40% and 41% in the U.K., and 12% and 26% in the US (OECD, 2022).

In Appendix 3 there are different organizations data that are used to calculate the share of income from international students in the entire volume of direct foreign investment into different countries of the world for several years, as well as the income from foreign students in absolute units. Appendix 4 has data about currency exchange rates. From them we selected data concerning the calculation of the share of income from international students in the entire volume of direct foreign investment in all the countries under study for 2018 and presented them in Table 3. If no data for 2018 are available the data for 2017 are given, which is marked by asterisk (*). As Table 3 shows, the share of student foreign investment in 16 countries of the world ranged during 2018 from a tenth of a percent to fifty percent. This share is lower than 1 percent in the U.S., Indonesia, Brazil. It is higher than 30 percent in the U.K., Germany and Canada.

Besides, Table 3 shows our calculations of shares of income from international students in the entire volume of export and GDP based on World Integrated Trade Solution tool (World Bank). Table 3 demonstrates that all the four anglophone countries have the lead in values of the share of income from international students in the entire volume of export. The values exceed 1%.

Canada and Australia are ahead with the same values of the share of income from international students in the GDP that amount to 1.17%. The values of this indicator for the other countries are lower than 1.

Table 3. The shares of income from international students in the entire volume of direct foreign investment, the entire volume of export, and the GDP in different countries of the world for 2018

Country	Direct foreign investment, million U.S. $	Export, million U.S. $	GDP, million U.S. $	Income from foreign students, million U.S. $	The share of income from international students in the entire volume of direct foreign investment, %	The share of income from international students in the entire volume of export, %	The share of income from international students in the GDP, %
Russia	8,757	451,494.83	1,657,328.87	1,881.39	21.48	0.42	0.11
China	134,970	2,486,439.72	13,894,817.55	5,722.03	4.24	0.23	0.04
U.S.	4,130,000	1,665,302.94	20,611,860.93	39,224.88	0.95	2.32	0.19
U.K.	64,487	490,840.36	2,857,316.52	23,592.63	36.59	4.81	0.83
Germany	25,706	1,562,418.82	3,961,831.91	8,698.10	33.84	0.56	0.22
France	37,294	568,535.88	2,786,502.57	5,395.34	14.47	0.95	0.19
India	42,286	322,291.57	2,701,111.78	472.58	1.12	0.15	0.02
Indonesia*	20,579	168,827.55	1,015,618.74	106.2	0.52	0.06	0.01
Iran*	5,019	105,844.09	445,345.26	228.9	4.56	0.22	0.05
Netherlands	69,659	587,852.28	913,597.09	2,537.96	3.64	0.43	0.28
Brazil*	67,583	214,988.11	2,063,507.86	255.35	0.38	0.12	0.01
Australia	60,438	252,775.52	1,432,881.17	16,775.52	27.76	6.64	1.17
Canada	39,625	450,392.40	1,721,853.33	20,153.75	50.86	4.47	1.17
Italy*	21,969	507,430.24	1,956,950.47	1,965.71	8.95	0.39	0.10
Spain	43,591	346,064.32	1,421,459.36	3,073.94	7.05	0.89	0.22
Portugal	4,895	74,135.90	242,194.79	515.9763	10.54	0.70	0.21

Note: Asterisk (*) marks countries with data for 2017; data on export and GDP are taken from WITS site (https://wits.worldbank.org/)

A priori, it might be supposed that direct foreign investment, total export and GDP concur. In this case, we might expect a strong correlation between share of income from international students in the entire volume of direct foreign investment and the values of the last two percentage indicators shown in Table 3. Indeed, correlation coefficient for total export equals 0.68, correlation coefficient for GDP equals 0.80.

OECD (2022) provides graphical representation of data for 28 countries concerning education-related services exports (gross) in millions of EUR for 2010 and 2019, as well as education-related services exports (gross) as percentage of total exports. These indicators correspond with indicators in the fifth and the seventh column in Table 3. Seven countries out of these 28 countries are presented in this table. Data for these 7 countries presented in Table 3 are very similar to those provided by OECD (2022). In fact, the values of the percentage indicator, taken from OECD report (Figure 7.7) are the following: Australia – 8.8%; Canada – 2.1%; the U.S. – 2%; the U.K. – 2%; France – 0.4% (2010); Italy – 0.24%; the Netherlands – 0.13%.

Concerning the countries from Table 3 we selected all their universities from THE and QS rankings for 2016/17 and from THE+QS rankings. Arithmetic mean value of the Overall (Total) Score for these universities in all the countries was found. Information about tuition fees for 2017 was taken from Appendix 3. A year gap between the ranking's publication time and the time of setting average tuition fees is explained by the fact that students need time to make their decisions to enter a university after rankings data are published. Initial statistics for three variants of calculations are presented in Tables 4–6. After that three linear regression equations were written (Figures 1–3).

Table 4. Data for calculating regression relationship between average tuition fees and average Overall Score for THE 2016-2017

Country	No. of Universities	Average Overall Score, THE 2016-2017	Average tuition fees/dollar 2017
Netherlands	13	60.392	14,550.56
Germany	41	51.417	12,200
U.S.	149	50.574	14,042
Canada	26	45.956	20,000
Australia	35	44.489	26,250
U.K.	92	42.282	31,380
France	29	41.016	528
Italy	38	37.741	8,679.78
Portugal	8	30.8	1,033.708
Spain	27	29.965	2,177.53
China	52	27.556	4,550.67
Russian Federation	24	23.952	2,865.67
India	31	22.487	5,305
Iran	13	20.415	2,000
Brazil	27	18.94	7,465.01
Indonesia	2	13.4	2,816

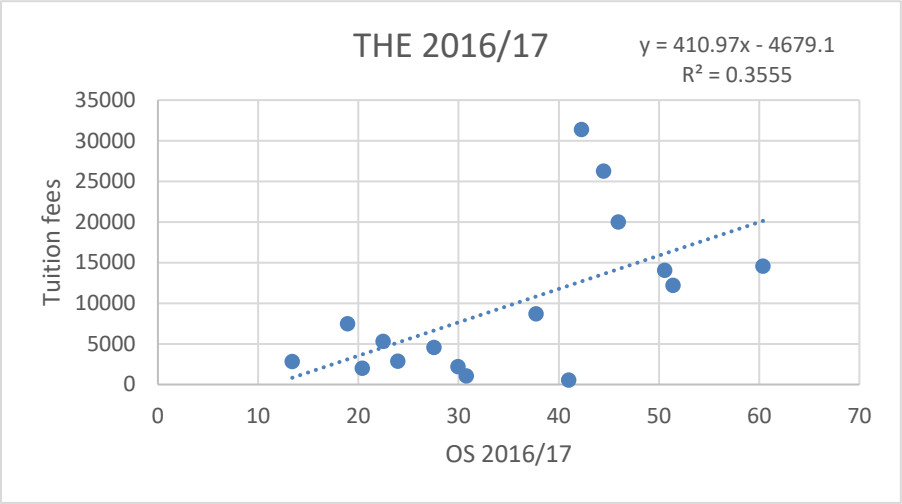

Figure 1. Regression relationship between tuition fees and average Overall Score (THE 2016-2017)

In linear regression equation shown in Figure 1 Pearson correlation coefficient equals R=0.596233. It is important that in THE rankings Overall Score is given for TOP-1000. That is why universities with positions lower than 1000 were not taken into consideration.

Table 5. Data for calculating regression relationship between average tuition fees and average Overall Score for QS 2016-2017

Country	No. of universities	Average Total Score, 2016/17	Average tuition fees/dollar 2017
U.S.	78	58.313	14,042
U.K.	48	56.894	31,380
Netherlands	13	56.5	14,550.56
Canada	15	53.327	20,000
China	15	52.92	4,550.67
Australia	21	51.648	26,250
Germany	24	47.646	12,200
Brazil	3	47.433	7,465.01
France	17	46.618	528
Spain	8	42.338	2,177.53
India	7	41.571	5,306
Italy	6	40.217	8,679.78
Russian Federation	8	38.038	2,865.67
Indonesia	1	35	2,816
Portugal	3	33.967	1,033.708

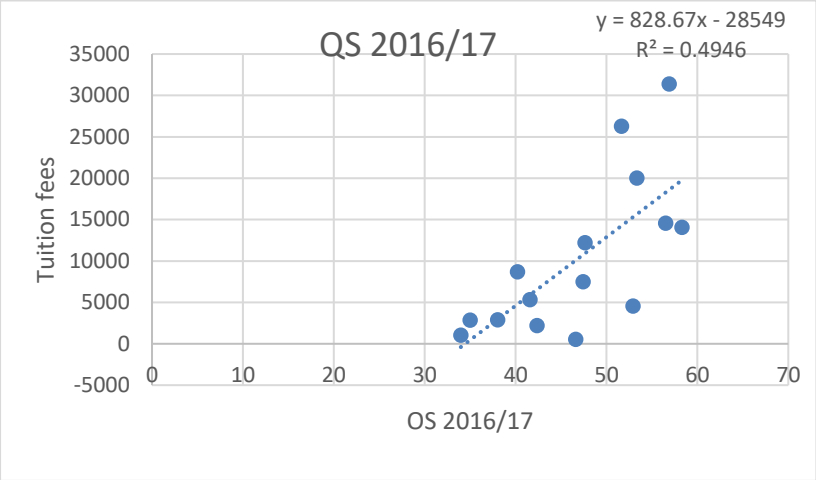

Figure 2. Regression relationship between tuition fees and average Overall Score (QS 2016-2017)

In linear regression equation shown in Figure 2 Pearson correlation coefficient equals R=0.703288. It is important that in QS rankings Overall Score is given for TOP-400. That is why universities with positions lower than 400 were not taken into consideration. This fact explains the much smaller number of universities in comparison with Table 4. Despite having 5 universities in the ranking Iran was excluded from Table 5 because all its universities have positions lower than 400.

Table 6. Data for calculating regression relationship between average tuition fees and average Total (Overall) Score for QS+THE 2016-2017

Country	Number of universities	Average Total (Overall) Score, QS+THE 2016 - 2017	Average tuition fees/dollar 2017
U.S.	227	54.4435	14,042
U.K.	140	49.588	31,380
Netherlands	26	58.446	14,550.56
Canada	41	49.6415	20,000
China	67	40.238	4,550.67
Australia	56	48.0685	26,250
Germany	65	49.5315	12,200
Brazil	30	33.1865	7,465.01
France	46	43.817	528
Spain	35	36.1515	2,177.53
India	38	32.029	5,306
Italy	44	38.979	8,679.78
Russian Federation	32	30.995	2,865.67
Indonesia	3	24.2	2,816
Portugal	11	32.3835	1,033.708

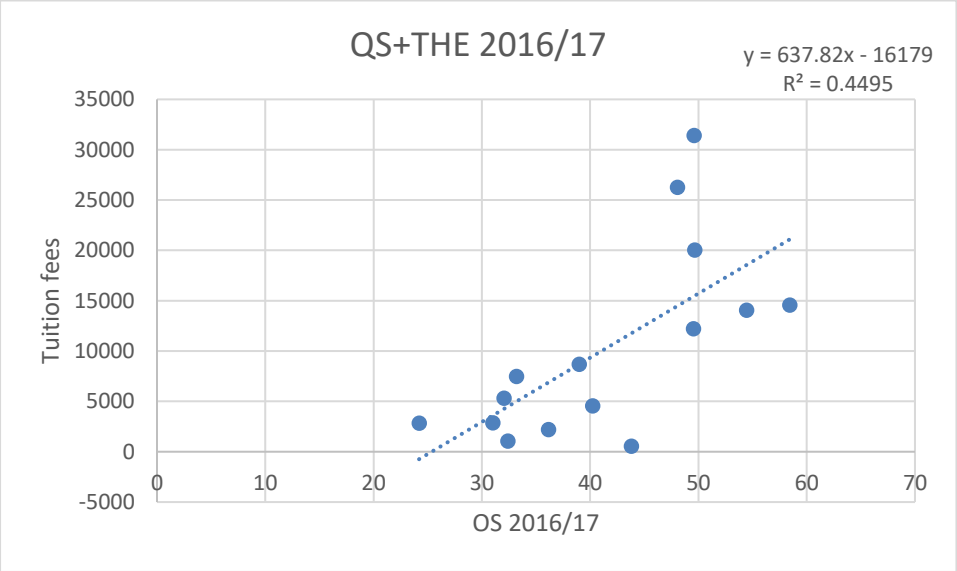

Figure 3. Regression relationship between average tuition fees and average Total (Overall) Score (QS+THE 2016-2017)

In linear regression equation shown in Figure 3 Pearson correlation coefficient equals R=0.670441. Accordingly, the correlation between average tuition fees and average Total (Overall) Score is strong in all three cases. The best correlation is found for QS rankings.

Conclusion

To conclude we are going to answer three research questions put in the introductory part of the paper.

1. For 11 countries with more than 15 universities in each there were performed calculations of correlation between integral indicators of QS, THE, ARWU, ranks of Webometrics Ranking and tuition fees for undergraduate and graduate students in these universities. Our research shows that the strongest correlation is characteristic of anglophone countries where price policy is liberal, tuition fees are not strictly regulated by the government and where there is bigger number of students in Master's and Doctor's programs, whose choices of university to study at are more guided by university rankings.

2. With the use of statistical data provided by national and international organizations for 16 countries there were performed calculations of the shares of income from international students (paying tuition fees and spending their money to provide their life in the receiving country) in direct foreign investment, total export and GDP. The values of the first indicator range from a tenth of a percent to fifty percent, the values of the second indicator range from 0 to 6.64%, the values of the third indicator range from 0 to 1.17%. The values of the second indicator accord with the data from OECD report (2022).

3. As tuition fees in universities depend on their positions in the world university rankings region and country income depend on global university competitiveness. We identified universities from QS and THE rankings for 15 countries, calculated their Overall (Total) Score and correlated it with average tuition fees. Pearson correlation coefficients for QS and THE are 0.7 and 0.6, respectively.

It is becoming more and more difficult for the states to finance higher education as before. That is why the governments encourage increase in tuition fees for international students despite the fact that they rise due to university reputation race. Accordingly, international students recruiting in many countries is a matter of survival of their universities as well as the territories where these universities are located. That is why it is a matter of material welfare of the territories where universities are located.

Author Contributions

Vladimir M. Moskovkin – conceptualization, methodology, formal analysis and original draft preparation; Zhang He – calculation and visualization, data curation.

Data Availability Statement

All data are available in the article and its appendices.

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Not applicable

Ethical considerations

The authors avoided from data fabrication and falsification.

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Conflict of interest

The authors declare no conflict of interest.

Appendix 1. Tuition fees for undergraduate and graduate students (U.S. dollars) in correlation with universities ranks in QS 2019

Rank QS / 2019	University	Country	City	Overall Score	Undergraduate	Graduate
1	Massachusetts Institute of Technology	U.S.	Boston	100	58,240.00	58,240.00
2	Stanford University	U.S.	Santa Clara	98.6	47,331.00	44,184.00
3	Harvard University	U.S.	Boston	98.5	66,900.00	66,900.00
4	California Institute of Technology	U.S.	Pasadena	97.2	48,111.00	48,111.00
9	University of Chicago	U.S.	Chicago	93.2	48,253.00	45,000.00
13	Princeton University	U.S.	Princeton	90.9	41,820.00	43,720.00
14	Cornell University	U.S.	Ithaca	90.5	52,612.00	34,444.00
15	Yale University	U.S.	New Haven	89.6	45,800.00	44,800.00
16	Columbia University	U.S.	New York City	88.5	46,846.00	39,000.00
19	University of Pennsylvania	U.S.	Philadelphia	86.5	69,340.00	69,340.00
21	Johns Hopkins University	U.S.	Baltimore	85.9	50,410.00	50,410.00
26	Duke University	U.S.	Durham	83.9	47,488.00	43,000.00
32	University of California Los Angeles	U.S.	Los Angeles	81.9	62,205.00	62,205.00
34	Northwestern University	U.S.	Evanston	81.5	47,251.00	43,000.00
41	University of California San Diego	U.S.	San Diego	78.6	55,587.00	55,587.00
43	New York University	U.S.	New York City	77.7	46,170.00	39,000.00
46	Carnegie Mellon University	U.S.	Pittsburgh	76.6	47,000.00	37,000.00
53	University of Wisconsin-Madison	U.S.	Madison	73.2	34,000.00	34,000.00
56	Brown University	U.S.	Providence	72	45,000.00	45,000.00
66	University of Washington	U.S.	Washington D.C.	67.8	51,321.00	51,321.00
69	Georgia Institute of Technology	U.S.	Atlanta	67.4	9,000.00	11,000.00
87	Rice University	U.S.	Houston	62.6	39,000.00	39,000.00
89	The Ohio State University	U.S.	Columbus	62.4	25,000.00	31,000.00
93	Boston University	U.S.	Boston	62	45,686.00	51,000.00
100	Purdue University	U.S.	West Lafayette	59.5	28,794.00	9,000.00
102	University of California Davis	U.S.	Davis	59.5	36,773.00	13,000.00
103	Washington University in St. Louis	U.S.	Saint Louis	59.5	46,467.00	43,000.00
115	University of Southern California	U.S.	Los Angeles	56.2	46,298.00	37,000.00
133	University of California Santa Barbara	U.S.	Santa Barbara	52.9	13,000.00	13,000.00
136	University of Pittsburgh	U.S.	Pittsburgh	51.8	17,000.00	21,000.00
142	Michigan State University	U.S.	Lansing	50.7	13,000.00	15,000.00
148	Emory University	U.S.	Druid Hills	49.6	43,000.00	39,000.00
182	University of Florida	U.S.	Gainesville	45.9	28,590.00	30,075.00
183	Dartmouth College	U.S.	Hanover	45.8	47,000.00	47,000.00
185	University of Rochester	U.S.	Rochester	45.5	43,000.00	33,000.00

186	Case Western Reserve University	U.S.	Cleveland	45.4	41,000.00	39,000.00
192	University of Virginia	U.S.	Charlottesville	44.8	13,000.00	17,000.00
196	Vanderbilt University	U.S.	Nashville	44.4	41,000.00	41,000.00
203	Texas A&M University	U.S.	College Station	43.5	25,126.00	5,000.00
212	Arizona State University	U.S.	Tempe	42.3	9,000.00	9,000.00
213	University of Notre Dame	U.S.	Notre Dame	42.3	43,000.00	43,000.00
214	University of Illinois at Chicago	U.S.	Chicago	42	21,000.00	23,000.00
226	Georgetown University	U.S.	WashingtonD.C.	40.8	45,000.00	41,000.00
238	Tufts University	U.S.	Medford	39	47,000.00	45,000.00
243	University of Miami	U.S.	Coral Gables	38.8	29,850.00	31,000.00
246	The University of Arizona	U.S.	Tucson	38.5	27,000.00	27,000.00
259	University of Massachusetts Amherst	U.S.	Amherst	37.3	27,000.00	27,000.00
280	North Carolina State University	U.S.	Raleigh	35.7	9,000.00	9,000.00
311	Yeshiva University	U.S.	New York City	33.7	37,000.00	25,000.00
323	Indiana University Bloomington	U.S.	Bloomington	32.7	11,000.00	9,000.00
326	Northeastern University	U.S.	Boston	32.3	39,000.00	40,000.00
336	University of California Santa Cruz	U.S.	Santa Cruz	31.9	13,000.00	13,000.00
342	Virginia Polytechnic Institute and State University	U.S.	Virginia Beach	31.7	20,000.00	23,000.00
346	Rensselaer Polytechnic Institute	U.S.	Troy	31.5	45,000.00	45,000.00
347	University of Utah	U.S.	Salt Lake City	31.5	19,961.00	24,024.00
368	University of Kansas	U.S.	Kansas City	29.9	9,000.00	9,000.00
377	Boston College	U.S.	Boston	29.2	45,000.00	25,000.00
390	Wake Forest University	U.S.	Winston-Salem	28.7	45,000.00	35,000.00
393	Washington State University	U.S.	Pullman	28.6	11,000.00	11,000.00
401	University of Colorado - Denver	U.S.	Denver	28.2	20,000.00	20,000.00
412	Tulane University	U.S.	New Orleans	27.5	45,000.00	45,000.00
419	The University of Tennessee-Knoxville	U.S.	Knoxville	27.2	9,000.00	11,000.00
426	Illinois Institute of Technology	U.S.	Chicago	26.9	39,000.00	23,000.00
429	Brandeis University	U.S.	Waltham	26.8	43,000.00	43,000.00
431	The University of Georgia	U.S.	Athens	26.7	9,000.00	9,000.00
438	University of Iowa	U.S.	Iowa City	26.4	20,000.00	20,000.00
440	University of Delaware	U.S.	Newark	26.2	13,000.00	29,000.00
441	Wayne State University	U.S.	Detroit	26.2	20,000.00	20,000.00
450	Colorado State University	U.S.	Fort Collins	25.7	9,886.00	9,000.00
451	Oregon State University	U.S.	Corvallis	25.7	11,000.00	23,000.00
455	University of Maryland Baltimore	U.S.	Baltimore	25.6	20,000.00	20,000.00
461	Clark University	U.S.	Worcester	25.3	39,000.00	39,000.00
472	Florida State University	U.S.	Tallahassee	25	21,673.00	27,750.00
489	Iowa State University	U.S.	Ames	24	7,000.00	9,000.00
497	University of Oklahoma	U.S.	Norman	23.7	7,000.00	7,000.00

RANK QS / 2019	University	Country	City	Overall Score	Undergraduate	Graduate
5	University of Oxford	U. K.	Oxford	96.8	20,676.00	20,676.00
6	University of Cambridge	U. K.	Cambridge	95.6	24,831.00	24,831.00
8	Imperial College London	U. K.	London	93.3	33,465.00	34,777.00
10	University College London	U. K.	London	92.9	25,237.00	24,948.00
18	The University of Edinburgh	U. K.	Edinburgh	86.9	20,801.00	16,076.00
29	The University of Manchester	U. K.	Manchester	82.9	26,247.00	23,622.00
31	King's College London	U. K.	London	82.5	19,948.00	21,628.00
38	London School of Economics and Political Science - University of London	U. K.	London	80.2	22,310.00	30,184.00
51	University of Bristol	U. K.	Bristol	74.9	20,735.00	20,735.00
74	Durham University	U. K.	Durham	65.7	19,554.00	24,803.00
94	University of Leeds	U. K.	Leeds	62	20,341.00	20,670.00
96	University of Southampton	U. K.	Southampton	61.6	21,069.00	24,344.00
119	Queen Mary University of London	U. K.	London	55.4	16,733.00	18,898.00
131	Lancaster University	U. K.	Lancaster	53	11,000.00	11,000.00
143	Newcastle University	U. K.	Newcastle upon Tyne	50.7	15,000.00	9,000.00
145	Cardiff University	U. K.	Cardiff	50.3	22,966.00	22,966.00
157	University of Bath	U. K.	Bath	48.6	15,000.00	9,000.00
165	University of Liverpool	U. K.	Liverpool	47.9	15,567.00	16,011.00
173	University of Aberdeen	U. K.	Aberdeen	46.6	3,000.00	5,000.00
180	Queen's University Belfast	U. K.	Belfast	45.9	17,061.00	7,000.00
218	Loughborough University	U. K.	Loughborough	41.4	15,000.00	7,000.00
225	University of Leicester	U. K.	Leicester	40.9	16,824.00	14,967.00
227	University of Sussex	U. K.	Brighton	40.7	15,000.00	9,000.00
236	Royal Holloway University of London	U. K.	London	39.1	15,000.00	9,000.00
248	University of Surrey	U. K.	Guildford	38.3	15,000.00	11,000.00
268	University of Strathclyde	U. K.	Glasgow	36.6	3,000.00	7,000.00
269	University of East Anglia	U. K.	Norwich	36.4	15,000.00	9,000.00
302	Heriot-Watt University	U. K.	Edinburgh	34.4	3,000.00	7,000.00
356	University of Essex	U. K.	Colchester	30.7	15,000.00	13,000.00
364	Oxford Brookes University	U. K.	Oxford	30.1	15,000.00	13,000.00
381	Aston University	U. K.	Birmingham	29	15,000.00	13,000.00
432	Aberystwyth University	U. K.	Aberystwyth	26.5	15,000.00	11,000.00
435	Bangor University	U. K.	Bangor	26.4	15,000.00	7,000.00
437	Swansea University	U. K.	Swansea	26.4	7,000.00	7,000.00

RANK QS / 2019	University	Country	City	Overall Score	Undergraduate	Graduate
17	Tsinghua University	China	Beijing	87.2	4,368.00	5,678.00
30	Peking University	China	Beijing	82.6	4,659.00	5,241.00
60	Shanghai Jiao Tong University	China	Shanghai	70.4	3,610.00	3,610.00
44	Fudan University	China	Shanghai	77.6	3,348.00	3,348.00
68	Zhejiang University	China	Hangzhou	67.5	4,338.00	4,338.00
98	University of Science and Technology of China	China	Hefei	60.8	3,785.00	3,785.00
123	Nanjing University	China	Nanjing	55	2,766.00	2,766.00
292	Beijing Normal University	China	Beijing	34.8	5,000.00	5,000.00
296	Sun Yat-Sen University	China	Guangzhou	34.7	3,348.00	3,348.00
285	Harbin Institute of Technology	China	Harbin	35.3	2,912.00	4,076.00
258	Wuhan University	China	Wuhan	37.5	2,402.00	2,402.00
338	Nankai University	China	Tianjin	31.7	2,912.00	3,785.00
415	Huazhong University of Science and Technology	China	Wuhan	27.4	3,640.00	3,640.00
291	Tongji University	China	Shanghai	34.9	5,000.00	5,000.00
475	Jilin University	China	Changchun	24.8	3,000.00	3,000.00
491	Beihang University	China	Beijing	23.9	3,640.00	4,368.00
477	Xiamen University	China	Amoy	24.7	3,000.00	3,000.00
444	Tianjin University	China	Tianjin	26	2,417.00	2,417.00
465	Beijing Institute of Technology	China	Beijing	25.2	3,000.00	7,000.00
423	Shanghai University	China	Shanghai	27	3,057.00	3,785.00
503	University of Science and Technology Beijing	China	Beijing	23.5	5,000.00	5,000.00

RANK QS/2019	University	Country	City	Overall Score	Undergraduate	Graduate
24	The Australian National University	Australia	Canberra	84.4	23,401.00	25,771.00
48	The University of Queensland	Australia	Brisbane	75.7	20,602.00	22,121.00
59	Monash University	Australia	Melbourne	70.4	25,751.00	26,739.00
91	The University of Western Australia	Australia	Perth	62.2	25,399.00	25,399.00
114	The University of Adelaide	Australia	Adelaide	56.6	23,282.00	25,399.00
215	The University of Newcastle	Australia	Newcastle	42	17,920.00	17,920.00
219	University of Wollongong	Australia	Wollongong	41.4	20,460.00	22,576.00
245	Queensland University of Technology	Australia	Brisbane	38.7	27,114.00	24,654.00
250	Curtin University	Australia	Perth	38	24,905.00	25,257.00
251	Macquarie University	Australia	Sydney	38	17,000.00	27,268.00
252	RMIT University	Australia	Melbourne	38	21,000.00	24,383.00
267	University of South Australia	Australia	Adelaide	36.7	23,564.00	24,129.00
287	University of Tasmania	Australia	Hobart	35.2	19,754.00	19,754.00
329	Griffith University	Australia	Gold Coast	32.1	18,696.00	20,813.00

369	James Cook University	Australia	Brisbane	29.7	19,049.00	19,754.00
389	Swinburne University of Technology	Australia	Melbourne	28.7	16,509.00	18,682.00
398	La Trobe University	Australia	Melbourne	28.2	13,969.00	13,969.00
443	Bond University	Australia	Gold Coast	26	27,000.00	24,442.00
478	Flinders University	Australia	Adelaide	24.6	15,451.00	15,451.00
499	Western Sydney University	Australia	Sydney	23.6	16,001.00	17,130.00

RANK QS / 2019	University	Country	City	Overall Score	Undergraduate	Graduate
23	The University of Tokyo	Japan	Tokyo	85.3	4,712.00	4,712.00
35	Kyoto University	Japan	Kyoto	81.2	4,712.00	4,712.00
58	Tokyo Institute of Technology	Japan	Tokyo	71	4,712.00	4,712.00
67	Osaka University	Japan	Suita	67.7	4,712.00	4,712.00
77	Tohoku University	Japan	Sendai	64.3	4,712.00	4,712.00
111	Nagoya University	Japan	Nagoya City	57.3	4,712.00	4,712.00
126	Kyushu University	Japan	Fukuoka	54.1	4,960.00	4,960.00
129	Hokkaido University	Japan	Sapporo	53.6	4,712.00	4,712.00
198	Keio University	Japan	Tokyo	44.1	7,388.00	8,091.00
262	University of Tsukuba	Japan	Tsukuba	37.1	4,712.00	4,712.00
321	Hiroshima University	Japan	Hiroshima	32.8	4,712.00	4,712.00
352	Kobe University	Japan	Kobe	30.9	4,960.00	4,960.00
353	Tokyo Medical and Dental University	Japan	Tokyo	30.9	4,369.00	4,712.00
457	Hitotsubashi University	Japan	Tokyo	25.5	5,000.00	5,000.00
460	Yokohama City University	Japan	Yokohama	25.4	5,000.00	5,000.00
466	Chiba University	Japan	Chiba	25.2	4,712.00	4,712.00

Appendix 2. Tuition fees for undergraduate and graduate students in correlation with universities ranks in THE 2019

Rank / 2019 THE	University	Country	City	Overall Score	Undergraduate	Graduate
2	California Institute of Technology	U.S.	Pasadena	94.5	48,111USD	48,111USD
4	Stanford University	U.S.	Santa Clara	94.3	47,331USD	44,184USD
5	Massachusetts Institute of Technology	U.S.	Boston	93.6	58,240USD	58,240USD
6	Princeton University	U.S.	Princeton	93.2	41,820USD	43,720USD
7	Harvard University	U.S.	Boston	93	66,900USD	66,900USD
8	Yale University	U.S.	New Haven	91.7	45,800USD	44,800USD
9	University of Chicago	U.S.	Chicago	90.2	48,253USD	45,000USD
11	University of Pennsylvania	U.S.	Philadelphia	89.6	69,340USD	69,340USD
12	Johns Hopkins University	U.S.	Baltimore	89.2	50,410USD	50,410USD
13	University of California	U.S.	Berkeley	88.3	42,802USD	32,756USD

16	Columbia University	U.S.	New York City	87	46,846USD	39,000USD
17	University of California Los Angeles	U.S.	Los Angeles	86.8	62,205USD	62,205USD
19	Cornell University	U.S.	Ithaca	85.1	52,612USD	34,444USD
20	Duke University	U.S.	Durham	84	47,488USD	43,000USD
21	University of Michigan	U.S.	Ann Arbor	83.8	41,811USD	39,000USD
22	Northwestern University	U.S.	Evanston	83.5	47,251USD	43,000USD
26	University of Washington	U.S.	Washington D.C.	81.6	51,321USD	51,321USD
27	Carnegie Mellon University	U.S.	Pittsburgh	81.3	47,000USD	37,000USD
29	New York University	U.S.	New York City	81.1	46,170USD	39,000USD
31	University of California San Diego	U.S.	San Diego	78.8	55,587USD	55,587USD
38	Georgia Institute of Technology	U.S.	Atlanta	75.4	9,000USD	11,000USD
39	The University of Texas at Austin	U.S.	Austin	75.4	33,000USD	21,000USD
48	University of Illinois at Urbana - Champaign	U.S.	Urbana	72.9	30,228USD	15,000USD
51	University of Wisconsin-Madison	U.S.	Madison	72	34,000USD	34,000USD
52	Washington University in St. Louis	U.S.	Saint Louis	71.5	46,467USD	43,000USD
53	Brown University	U.S.	Providence	70	45,000USD	45,000USD
54	University of North Carolina at Chapel Hill	U.S.	Chapel Hill	69.9	33,624USD	19,000USD
55	University of California Davis	U.S.	Davis	69.7	36,773USD	13,000USD
57	University of California Santa Barbara	U.S.	Santa Barbara	69.6	13,000USD	13,000USD
61	Boston University	U.S.	Boston	68.5	45,686USD	51,000USD
62	University of Southern California	U.S.	Los Angeles	68.1	46,298USD	37,000USD
70	The Ohio State University	U.S.	Columbus	66.1	25,000USD	31,000USD
78	The Pennsylvania State University	U.S.	University Park	64.2	29,566USD	33,000USD
79	University of Minnesota-Duluth	U.S.	Minneapolis	64.1	20,876USD	15,000USD
80	Emory University	U.S.	Druid Hills	64	43,000USD	39,000USD
84	Michigan State University	U.S.	Lansing	63.9	13,000USD	15,000USD
88	Purdue University	U.S.	West Lafayette	63.1	28,794USD	9,000USD
91	University of Maryland College Park	U.S.	College Park	62.7	28,348USD	15,000USD
94	Dartmouth College	U.S.	Hanover	62.4	47,000USD	47,000USD
96	University of California Irvine	U.S.	Irvine	62.3	11,000USD	11,000USD
102	Georgetown University	U.S.	Washington D.C.	61.9	45,000USD	41,000USD
104	The University of Arizona	U.S.	Tucson	61.8	27,000USD	27,000USD
105	Rice University	U.S.	Houston	61.6	39,000USD	39,000USD
107	University of Virginia	U.S.	Charlottesville	61.5	13,000USD	17,000USD
113	University of Pittsburgh	U.S.	Pittsburgh	60.4	17,000USD	21,000USD
116	Vanderbilt University	U.S.	Nashville	60.2	41,000USD	41,000USD

119	Case Western Reserve University	U.S.	Cleveland	60	41,000USD	39,000USD
124	University of Colorado at Boulder	U.S.	Boulder	59.6	33,151USD	11,000USD
134	Indiana University Bloomington	U.S.	Bloomington	58.4	11,000USD	9,000USD
139	Tufts University	U.S.	Medford	58	47,000USD	45,000USD
155	Arizona State University	U.S.	Tempe	57.1	9,000USD	9,000USD
157	University of Notre Dame	U.S.	Notre Dame	56.9	43,000USD	43,000USD
168	State University of New Jersey - Newark	U.S.	Newark	56	13,000USD	17,000USD
172	University of Alabama at Birmingham	U.S.	Birmingham	55.7	20,000USD	20,000USD
173	Northeastern University	U.S.	Boston	55.6	39,000USD	40,000USD
174	University of Rochester	U.S.	Rochester	55.6	43,000USD	33,000USD
175	University of Florida	U.S.	Gainesville	55.4	28,590USD	30,075USD
178	Texas A&M University	U.S.	College Station	55.3	25,126USD	5,000USD
179	University of California Santa Cruz	U.S.	Santa Cruz	55.2	13,000USD	13,000USD
198	The George Washington University	U.S.	Washington D.C.	53.8	49,000USD	27,000USD
Rank/ 2019 THE	**University**	**Country**	**City**	**Overall Score**	**Undergraduate**	**Graduate**
1	University of Oxford	U. K.	Oxford	95.4	20,676USD	20,676USD
3	University of Cambridge	U. K.	Cambridge	94.4	24,831USD	24,831USD
10	Imperial College London	U. K.	London	89.8	33,465USD	34,777USD
15	University College London	U. K.	London	87.1	25,237USD	24,948USD
27	London School of Economics and Political Science - University of London	U. K.	London	81.3	22,310USD	30,184USD
30	The University of Edinburgh	U. K.	Edinburgh	79.4	20,801USD	16,076USD
36	King's College London	U. K.	London	75.7	19,948USD	21,628USD
55	The University of Manchester	U. K.	Manchester	69.7	26,247USD	23,622USD
77	University of Warwick	U. K.	Coventry	64.6	26,483USD	29,318USD
87	University of Bristol	U. K.	Bristol	63.2	20,735USD	20,735USD
99	The University of Glasgow	U. K.	Glasgow	62.2	18,635USD	20,013USD
110	Queen Mary University of London	U. K.	London	61.3	16,733USD	18,898USD
112	The University of Birmingham	U. K.	Birmingham	60.9	19,095USD	19,095USD
117	University of Sheffield	U. K.	Sheffield	60.1	23,130USD	23,130USD
122	University of Southampton	U. K.	Southampton	59.8	21,069USD	24,344USD
128	The University of York	U. K.	York	58.9	20,578USD	22,874USD
133	Durham University	U. K.	Durham	58.5	19,554USD	24,803USD
139	Lancaster University	U. K.	Lancaster	58	11,000USD	11,000USD
146	University of Exeter	U. K.	Exeter	57.4	15,000USD	13,000USD
146	University of Sussex	U. K.	Brighton	57.4	15,000USD	9,000USD
152	The University of Nottingham	U. K.	Nottingham	57.2	26,339USD	17,717USD

155	University of Leeds	U. K.	Leeds	57.1	20,341USD	20,670USD
165	University of Liverpool	U. K.	Liverpool	56.3	15,567USD	16,011USD
166	University of Leicester	U. K.	Leicester	56.1	16,824USD	14,967USD
168	University of Aberdeen	U. K.	Aberdeen	56	3,000USD	5,000USD
192	University of East Anglia	U. K.	Norwich	54.2	15,000USD	9,000USD
198	Cardiff University	U. K.	Cardiff	53.8	22,966USD	22,966USD
199	University of St. Andrews	U. K.	St Andrews	53.8	18,373USD	9,000USD

Rank / 2019 THE	University	Country	City	Overall Score	Undergraduate	Graduate
32	University of Munich	Germany	Munich	77.8	261USD	1,000USD
43	Technical University of Munich	Germany	Munich	74.1	135USD	135USD
44	Heidelberg University	Germany	Heidelberg	73.5	328USD	1,000USD
74	Humboldt University Berlin	Germany	Berlin	65	685USD	1,000USD
86	University of Freiburg	Germany	Freiburg	63.3	328USD	328USD
91	University of Tübingen	Germany	Tübingen	62.7	331USD	331USD
99	RWTH - Aachen University	Germany	Aachen	62.2	577USD	577USD
105	Rhenish Friedrich-Wilhelm University Bonn	Germany	Bonn	61.6	627USD	627USD
117	Free University of Berlin	Germany	Berlin	60.1	684USD	1,000USD
125	Georg August University Göttingen	Germany	Göttingen	59.5	738USD	738USD
141	Ulm University	Germany	Ulm	57.9	1,000USD	1,000USD
149	University of Hamburg	Germany	Hamburg	57.3	722USD	722USD
157	University of Cologne	Germany	Cologne	56.9	577USD	577USD
158	University of Mannheim	Germany	Mannheim	56.9	1,000USD	1,000USD
159	TU Dresden	Germany	Dresden	56.9	279USD	1,000USD
163	Julius Maximilian University of Würzburg	Germany	Wurzburg	56.8	287USD	287USD
166	University of Bielefeld	Germany	Bielefeld	56.1	1,000USD	1,000USD
175	Karlsruhe Institute of Technology	Germany	Karlsruhe	55.4	3,460USD	3,460USD
183	Friedrich-Alexander University of Erlangen-Nuremberg	Germany	Erlangen	54.9	1,000USD	1,000USD
189	Westphalian Wilhelms University Münster	Germany	Munster	54.3	623USD	623USD
194	University of Duisburg-Essen	Germany	Duisburg	54	1,000USD	1,000USD

Appendix 3. Data used to calculate the share of income from international students in the entire volume of direct foreign investment into different countries of the world for different years.

Russia

Year	Direct foreign investment, mln. U.S. $	The number of foreign students, thousand people	Annual tuition fee for foreign students, U.S. $	Annual expenses of one foreign student in the receiving country, U.S. $	Annual tuition fee and annual expenses of one foreign student in the receiving country summed up, U.S. $	Income from foreign students, mln. U.S. $	The share of income from international students in the entire volume of direct foreign investment, %
2011	55,084	158.4	5,684.81	8,749.46	14,434.27	2,286.39	4.15
2012	50,588	164.8	5,377.36	8,276.27	13,653.64	2,250.12	4.45
2013	69,219	205.7	5,246.31	8,074.58	13,320.89	2,740.11	3.96
2014	22,031	224.6	4,343.84	6,685.57	11,029.41	2,477.21	11.24
2015	6,853	242.5	2,726.06	4,195.67	6,921.74	1,678.52	24.49
2016	32,539	244	2,486.88	3,827.54	6,314.42	1,540.72	4.73
2017	28,557	260.1	2,865.67	4,410.53	7,276.20	1,892.54	6.63
2018	8,757	278	2,665.36	4,102.24	6,767.60	1,881.39	21.48

Annual average expenses of international students in the receiving country including tuition fee equal annual average expenses of one international student in the receiving country including tuition fee multiplied by the number of international students.

The number of international students, thousand people, 2011-2017: (The data are from sociological research "Prospects and problems of international citizens' study in the Russian higher education institutions", 2019) https://www.5top100.ru/upload/iblock/57e/obuchenie-inostrannykh-grazhdan-v-rossiyskikh-uchrezhdeniyakh-vysshego-obrazovaniya.pdf

The number of international students, thousand people, 2018 (The data are from statistics digest "Education in numbers: 2019" by National Research University Higher School of Economics) https://www.hse.ru/primarydata/oc2019

The volume of direct foreign investment, mln. US dollars (Russian statistical yearbook) https://rosstat.gov.ru/folder/210/document/12994

The amount of monthly expenses by international students (The data are from sociological research "Prospects and problems of international citizens' study in the Russian higher education institutions", 2019) https://www.5top100.ru/upload/iblock/57e/obuchenie-inostrannykh-grazhdan-v-rossiyskikh-uchrezhdeniyakh-vysshego-obrazovaniya.pdf

Annual tuition fee for international students in 2019 (The data are from sociological research "Prospects and problems of international citizens' study in the Russian higher education institutions", 2019) https://www.5top100.ru/upload/iblock/57e/obuchenie-inostrannykh-grazhdan-v-rossiyskikh-uchrezhdeniyakh-vysshego-obrazovaniya.pdf

China

Year	Direct foreign investment, mln. U.S. $	The number of foreign students, thousand people	Annual tuition fee for foreign students, U.S. $	Annual expenses of one foreign student in the receiving country, U.S. $	Annual tuition fee and annual expenses of one foreign student in the receiving country summed up, U.S. $	Income from foreign students, mln. U.S. $	The share of income from international students in the entire volume of direct foreign investment, %
2011	116,011	292.6	4,712.69	7,182.66	11,895.36	3,480.58	3.00
2012	111,716	328.3	4,832.38	7,365.08	12,197.46	4,004.43	3.58
2013	117,586	336.5	4,950.24	7,544.72	12,494.96	4,204.55	3.58
2014	119,560	377.0	4,942.21	7,532.47	12,474.68	4,702.95	3.93
2015	126,270	397.6	4,794.33	7,307.09	12,101.42	4,811.52	3.81
2016	126,000	442.8	4,543.88	6,925.37	11,469.25	5,078.59	4.03
2017	131,040	489.2	4,550.67	6,935.72	11,486.40	5,619.15	4.29
2018	134,970	492.2	4,605.75	7,019.67	11,625.42	5,722.03	4.24

Average expenses of one international student including annual tuition fee: http://baijiahao.baidu.com/s?id=1640004194459045959&wfr=spider&for=pc

The United States of America

Year	Direct foreign investment, mln. U.S. $	The number of foreign students, thousand people	Annual tuition fee for foreign students, U.S. $	Annual expenses of one foreign student in the receiving country, U.S. $	Annual tuition fee and annual expenses of one foreign student in the receiving country summed up, U.S. $	Income from foreign students, mln. U.S. $	The share of income from international students in the entire volume of direct foreign investment, %
2011	2,430,000	764.5	11,204	21,300	32,504	24,849.31	1.02
2012	2,580,000	819.6	11,799	21,300	33,099	27,127.94	1.05
2013	2,730,000	886.1	12,214	21,300	33,514	29,696.76	1.09
2014	2,950,000	974.9	12,706	21,300	34,006	33,152.45	1.12
2015	3,350,000	1043.8	13,139	21,300	34,439	35,947.43	1.07
2016	3,770,000	1078.8	13,538	21,300	34,838	37,583.23	1.00
2017	3,790,000	1094.8	14,042	21,300	35,342	38,692.42	1.02
2018	4,130,000	1095.3	14,512	21,300	35,812	39,224.88	0.95

The number of international students, thousand people: https://www.statista.com/statistics/237681/international-students-in-the-us/

The volume of direct foreign investment, mln. US dollars: https://www.statista.com/statistics/188870/foreign-direct-investment-in-the-united-states-since-1990/

Annual tuition fee for international students, US dollars: https://www.statista.com/statistics/238109/tuition-and-fees-in-the-us/#statisticContainer

The amount of monthly expenses by international students, US dollars = 1775
https://www.collegedekho.com/usa/average-cost-living/

The U.K.

Year	Direct foreign investment, mln. U.S. $	The number of foreign students, thousand people	Annual tuition fee for foreign students, U.S. $	Annual expenses of one foreign student in the receiving country, U.S. $	Annual tuition fee and annual expenses of one foreign student in the receiving country summed up, U.S. $	Income from foreign students, mln. U.S. $	The share of income from international students in the entire volume of direct foreign investment, %
2011	42,200	435.235	31,380	17200	48,580	21,143.72	50.10
2012	55,446	425.265	31,380	17200	48,580	20,659.37	37.26
2013	51,676	435.495	31,380	17200	48,580	21,156.35	40.94
2014	24,690	436.88	31,380	17200	48,580	21,223.63	85.96
2015	32,720	438.515	31,380	17200	48,580	21,303.06	65.11
2016	196,130	442.75	31,380	17200	48,580	21,508.80	10.97
2017	101,238	458.52	31,380	17200	48,580	22,274.90	22.00
2018	64,487	485.645	31,380	17200	48,580	23,592.63	36.59

The number of international students, thousand people: http://toopix.biz/agame/play.html?adv=33

The volume of direct foreign investment, 2013-2018: http://unctad.org/system/files/official-document/wir2019_en.pdf

The volume of direct foreign investment, 2011-2012: http://unctad.org/system/files/official-document/wir2016_en.pdf

Annual tuition fee for international students and the amount of monthly expenses by international students, US dollars: http://topuniversities.com/student-info/student-finance/how-much-does-it-cost-study-uk

Germany

Year	Direct foreign investment, mln. U.S. $	The number of foreign students, thousand people	Annual tuition fee for foreign students, U.S. $	Annual expenses of one foreign student in the receiving country, U.S. $	Annual tuition fee and annual expenses of one foreign student in the receiving country summed up, U.S. $	Income from foreign students, mln. U.S. $	The share of income from international students in the entire volume of direct foreign investment, %
2011	67,514	265.292	12,200	9,900	22,100	5,862.95	8.68
2012	28,181	282.201	12,200	9,900	22,100	6,236.64	22.13
2013	15,572	301.35	12,200	9,900	22,100	6,659.84	42.77
2014*	4,864	321.569	12,200	9,900	22,100	7,106.67	146.11
2015	41,444	340.305	12,200	9,900	22,100	7,520.74	18.15
2016	23,500	358.895	12,200	9,900	22,100	7,931.58	33.75
2017	36,931	374.951	12,200	9,900	22,100	8,286.42	22.44
2018	25,706	393.579	12,200	9,900	22,100	8,698.10	33.84

Data about 16 federated states and all the state universities https://www.topuniversities.com/student-info/university-news/undergraduate-tuition-fees-axed-all-universities-germany

The number of international students, thousand people: http://thelocal.de/20190820/number-of-international-students-in-germany

The volume of direct foreign investment, 2013-2018: http://unctad.org/system/files/official-document/wir2019_en.pdf

The volume of direct foreign investment, 2011-2012: http://unctad.org/system/files/official-document/wir2016_en.pdf

Annual tuition fee for international students and the amount of monthly expenses by international students, Euro: http://topuniversities.com/student-info/student-finance/how-much-does-it-cost-study-germany

France

Year	Direct foreign investment, mln. U.S. $	The number of foreign students, thousand people	Annual tuition fee for foreign students, U.S. $	Annual expenses of one foreign student in the receiving country, U.S. $	Annual tuition fee and annual expenses of one foreign student in the receiving country summed up, U.S. $	Income from foreign students, mln. U.S. $	The share of income from international students in the entire volume of direct foreign investment, %
2011	31,642	230.9	653	21,667	22,319	5,153.56	16.29
2012	16,979	231.200	599	19,873	20,471	4,732.97	27.88
2013	34,270	235.100	627	20,800	21,427	5,037.41	14.70
2014	15,191	238.200	610	20,260	20,870	4,971.26	32.73
2015	45,347	244.100	531	17,627	18,158	4,432.41	9.77
2016	23,061	254.700	514	17,049	17,563	4,473.26	19.40
2017	29,802	270.500	528	17,528	18,056	4,884.20	16.39
2018	37,294	283.700	556	18,462	19,018	5,395.34	14.47

The number of international students, thousand people: http://masteryourfrench.com/france/higher-education-landscape/

The volume of direct foreign investment, 2013-2018: http://unctad.org/system/files/official-document/wir2019_en.pdf

The volume of direct foreign investment, 2011-2012: http://unctad.org/system/files/official-document/wir2016_en.pdf

Annual tuition fee for international students and the amount of monthly expenses by international students, Euro: http://mastersportal.com/articles/355/tuition-fees-and-living-costs-in-france.html

India

Year	Direct foreign investment, mln. U.S. $	The number of foreign students, thousand people	Annual tuition fee for foreign students, U.S. $	Annual expenses of one foreign student in the receiving country, U.S. $	Annual tuition fee and annual expenses of one foreign student in the receiving country summed up, U.S. $	Income from foreign students, mln. U.S. $	The share of income from international students in the entire volume of direct foreign investment, %
2011	36,190	33.151	7,129	6,844	13,973	463.22	1.28
2012	24,196	--	6,606	6,342	12,948	--	--
2013	28,199	20.176	5,787	5,556	11,343	228.85	0.81
2014	34,582	31.126	5,732	5,503	11,235	349.70	1.01
2015	44,064	30.423	5,453	5,234	10,687	325.13	0.74
2016	44,481	--	5,187	4,979	10,166	--	--
2017	39,904	46.144	5,306	5,094	10,400	479.91	1.20
2018	42,286	47.427	5,084	4,881	9,964	472.58	1.12

The number of international students, thousand people, 2011-2015: http://aiu.ac.in/documents/international/AIU_International_Students_2017.pdf

The number of international students, thousand people, 2016-2018: http://universityworldnews.com/post.php?story=2019092708443536

The volume of direct foreign investment, 2013-2018: http://unctad.org/system/files/official-document/wir2019_en.pdf

The volume of direct foreign investment, 2011-2012: http://unctad.org/system/files/official-document/wir2016_en.pdf

Annual tuition fee for international students and the amount of monthly expenses by international students, US dollars: http://tflguide.com/cost-of-higher-education-in-india-calculator-infographics/

Indonesia

Year	Direct foreign investment, mln. U.S. $	The number of foreign students, thousand people	Annual tuition fee for foreign students, U.S. $	Annual expenses of one foreign student in the receiving country, U.S. $	Annual tuition fee and annual expenses of one foreign student in the receiving country summed up, U.S. $	Income from foreign students, mln. U.S. $	The share of income from international students in the entire volume of direct foreign investment, %
2015	16,641	7.3	2,816	10,800	13,616	99.40	0.60
2016	3,921	7.7	2,816	10,800	13,616	104.84	2.67
2017	20,579	7.8	2,816	10,800	13,616	106.20	0.52

The number of international students, thousand people, 2015-2017: https://migrationdataportal.org

The volume of direct foreign investment, 2015-2017: http://unctad.org/system/files/official-document/wir2019_en.pdf

Annual tuition fee for international students and the amount of monthly expenses by international students, US dollars: https://worldscholarshipforum.com/study-in-indonesia-tution-fees-requirements-and-cost-of-living/

Iran

Year	Direct foreign investment, mln. U.S. $	The number of foreign students, thousand people	Annual tuition fee for foreign students, U.S. $	Annual expenses of one foreign student in the receiving country, U.S. $	Annual tuition fee and annual expenses of one foreign student in the receiving country summed up, U.S. $	Income from foreign students, mln. U.S. $	The share of income from international students in the entire volume of direct foreign investment, %
2013	3,050	7.1	2,000	8,900	10,900	77.39	2.54
2014	2,105	11.3	2,000	8,900	10,900	123.17	5.85
2016	3,372	18.7	2,000	8,900	10,900	203.83	6.04
2017	5,019	21	2,000	8,900	10,900	228.9	4.56

The number of international students, thousand people, 2013-2017: https://migrationdataportal.org/?t=2017&cm49=364&i=stud_in_

The volume of direct foreign investment, 2013-2017: http://unctad.org/system/files/official-document/wir2019_en.pdf

Annual tuition fee for international students and the amount of monthly expenses by international students, US dollars: https://www.studyabroaduniversities.com/Cost-of-Study-and-Living-in-Iran.aspx

The Netherlands

Year	Direct foreign investment, mln. U.S. $	The number of foreign students, thousand people	Annual tuition fee for foreign students, U.S. $	Annual expenses of one foreign student in the receiving country, U.S. $	Annual tuition fee and annual expenses of one foreign student in the receiving country summed up, U.S. $	Income from foreign students, mln. U.S. $	The share of income from international students in the entire volume of direct foreign investment, %
2011	24,368	52.14	17,986.11	16,666.67	34,652.78	1,806.80	7.41
2012	20,114	54.234	16,496.82	15,286.62	31,783.44	1,723.74	8.57
2013	51,105	56.494	17,266.67	16,000	33,266.67	1,879.37	3.68
2014	44,974	58.14	16,818.18	15,584.42	32,402.6	1,883.89	4.19
2015	178,785	62.373	14,632.77	13,559.32	28,192.09	1,758.43	0.98
2016	64,329	68.526	14,153.01	13,114.75	27,267.76	1,868.55	2.90
2017	58,189	76.606	14,550.56	13,483.15	28,033.71	2,147.55	3.69
2018	69,659	85.955	15,325.44	14,201.18	29,526.62	2,537.96	3.64

The number of international students, thousand people: https://www.statista.com/statistics/699754/international-students-in-the-netherlands/

The volume of direct foreign investment, 2013-2018: http://unctad.org/system/files/official-document/wir2019_en.pdf

The volume of direct foreign investment, 2011-2012: http://unctad.org/system/files/official-document/wir2016_en.pdf

Annual tuition fee for international students and the amount of monthly expenses by international students, Euro: https://www.mastersportal.com/articles/553/costs-of-studying-abroad-in-the-netherlands-tuition-housing-and-food.html

Brazil

Year	Direct foreign investment, mln. U.S. $	The number of foreign students, thousand people	Annual tuition fee for foreign students, U.S. $	Annual expenses of one foreign student in the receiving country, U.S. $	Annual tuition fee and annual expenses of one foreign student in the receiving country summed up, U.S. $	Income from foreign students, mln. U.S. $	The share of income from international students in the entire volume of direct foreign investment, %
2014	63,846	19.1	9,736.31	6,352.94	16,089.25	307.30	0.48
2015	49,514	19.9	7,111.11	4,640.00	11,751.11	233.85	0.47
2016	52,751	20	6,611.57	4,314.05	10,925.62	218.51	0.41
2017	67,583	20.7	7,465.01	4,870.92	12,335.93	255.35	0.38

The number of international students, thousand people, 2014-2017: https://migrationdataportal.org/?t=2017&cm49=76&i=stud_in_

The volume of direct foreign investment, 2014-2017: http://unctad.org/system/files/official-document/wir2019_en.pdf

Annual tuition fee for international students and the amount of monthly expenses by international students, Brazilizn real: https://www.timeshighereducation.com/student/advice/cost-studying-university-brazil

Australia

Year	Direct foreign investment, mln. U.S. $	The number of foreign students, thousand people	Annual tuition fee for foreign students, U.S. $	Annual expenses of one foreign student in the receiving country, U.S. $	Annual tuition fee and annual expenses of one foreign student in the receiving country summed up, U.S. $	Income from foreign students, mln. U.S. $	The share of income from international students in the entire volume of direct foreign investment, %
2011	58,908	241.425	26,250	15,840	42,090	10,161.58	17.25
2012	58,981	230.343	26,250	15,840	42,090	9,695.14	16.44
2013	56,765	230.705	26,250	15,840	42,090	9,710.37	17.11
2014	58,507	249.348	26,250	15,840	42,090	10,495.06	17.94
2015	28,270	271.647	26,250	15,840	42,090	11,433.62	40.44
2016	45,522	305.319	26,250	15,840	42,090	12,850.88	28.23
2017	42,294	349.123	26,250	15,840	42,090	14,694.59	34.74
2018	60,438	398.563	26,250	15,840	42,090	16,775.52	27.76

The number of international students, thousand people: https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/rp/rp1819/Quick_Guides/OverseasStudents

The volume of direct foreign investment, 2013-2018: http://unctad.org/system/files/official-document/wir2019_en.pdf

The volume of direct foreign investment, 2011-2012: http://unctad.org/system/files/official-document/wir2016_en.pdf

Annual tuition fee for international students, US dollars: https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/rp/rp1819/Quick_Guides/OverseasStudents

The amount of monthly expenses by international students, US dollars: https://www.topuniversities.com/student-info/student-finance/how-much-does-it-cost-study-australia

Canada

Year	Direct foreign investment, mln. U.S. $	The number of foreign students, thousand people	Annual tuition fee for foreign students, U.S. $	Annual expenses of one foreign student in the receiving country, U.S. $	Annual tuition fee and annual expenses of one foreign student in the receiving country summed up, U.S. $	Income from foreign students, mln. U.S. $	The share of income from international students in the entire volume of direct foreign investment, %
2011	39,669	248.582	20,000	15,050	35,050	8,712.80	21.96
2012	43,111	274.818	20,000	15,050	35,050	9,632.37	22.34
2013	69,391	301.755	20,000	15,050	35,050	10,576.51	15.24
2014	58,933	326.085	20,000	15,050	35,050	11,429.28	19.39
2015	43,825	349.921	20,000	15,050	35,050	12,264.73	27.99
2016	35,992	409.804	20,000	15,050	35,050	14,363.63	39.91
2017	24,832	492.533	20,000	15,050	35,050	17,263.28	69.52
2018	39,625	575.000	20,000	15,050	35,050	20,153.75	50.86

The number of international students, thousand people, 2011-2017: https://www.statista.com/statistics/555117/number-of-international-students-at-years-end-canada-2000-2014/

The number of international students, thousand people, 2018: https://blog.thepienews.com/2019/06/will-canada-have-quadrupled-its-international-student-numbers-in-eight-years/

The volume of direct foreign investment, 2013-2018: http://unctad.org/system/files/official-document/wir2019_en.pdf

The volume of direct foreign investment, 2011-2012: http://unctad.org/system/files/official-document/wir2016_en.pdf

Annual tuition fee for international students and the amount of monthly expenses by international students, US dollars: https://www.timeshighereducation.com/student/advice/cost-studying-university-canada

Italy

Year	Direct foreign investment, mln. U.S. $	The number of foreign students, thousand people	Annual tuition fee for foreign students, U.S. $	Annual expenses of one foreign student in the receiving country, U.S. $	Annual tuition fee and annual expenses of one foreign student in the receiving country summed up, U.S. $	Income from foreign students, mln. U.S. $	The share of income from international students in the entire volume of direct foreign investment, %
2013	24,273	82.5	10,300	13,600	23,900	1,971.75	8.12
2014	23,223	87.5	10,032.47	13,246.75	23,279.22	2,036.93	8.77
2015	19,628	90.4	8,728.81	11,525.42	20,254.24	1,830.98	9.33
2016	28,449	92.7	8,442.62	11,147.54	19,590.16	1,816.01	6.38
2017	21,969	97.6	8,679.78	11,460.67	20,140.45	1,965.71	8.95

The number of international students, thousand people, 2013-2017: http://migrationdataportal.org/?t=2017&cm49=380&i=stud_in_

The volume of direct foreign investment, 2013-2017: http://unctad.org/system/files/official-document/wir2019_en.pdf

Annual tuition fee for international students and the amount of monthly expenses by international students, Euro: http://mastersportal.com/articles/1733/tuition-and-living-costs-in-italy.html

Spain

Year	Direct foreign investment, mln. U.S. $	The number of foreign students, thousand people	Annual tuition fee for foreign students, U.S. $	Annual expenses of one foreign student in the receiving country, U.S. $	Annual tuition fee and annual expenses of one foreign student in the receiving country summed up, U.S. $	Income from foreign students, mln. U.S. $	The share of income from international students in the entire volume of direct foreign investment, %
2015	11,911	153.193	2,189.83	12,881.36	15,071.19	2,308.8	19.38
2016	27,658	166.963	2,118.03	12,459.02	14,577.05	2,433.828	8.80
2017	20,918	185.145	2,177.53	12,808.99	14,986.52	2,774.679	13.26
2018	43,591	194.743	2,293.49	13,491.12	15,784.62	3,073.943	7.05

The number of international students, thousand people, 2015-2018: http://studying-in-spain.com/spain-international-student-statistics/

The volume of direct foreign investment, 2013-2017: http://unctad.org/system/files/official-document/wir2019_en.pdf

Annual tuition fee for international students and the amount of monthly expenses by international students, Euro: http://study.eu/country/spain.

http://studentsmobility.com/cost-of-living-in-spain-as-a-student/

Portugal

Year	Direct foreign investment, mln. U.S. $	The number of foreign students, thousand people	Annual tuition fee for foreign students, U.S. $	Annual expenses of one foreign student in the receiving country, U.S. $	Annual tuition fee and annual expenses of one foreign student in the receiving country summed up, U.S. $	Income from foreign students, mln. U.S. $	The share of income from international students in the entire volume of direct foreign investment, %
2012	8,869	27.5	1,171.975	9,936.306	11,108.28	305.4777	3.44
2013	2,702	30.7	1,226.667	10,400	11,626.67	356.9387	13.21
2014	2,999	34.019	1,194.805	10,129.87	11,324.68	385.2541	12.85
2015	6,926	38.7	1,039.548	8,813.559	9,853.107	381.3153	5.51
2016	6,310	41.2	1,005.464	8,524.59	9,530.055	392.6383	6.22
2017	6,946	49.708	1,033.708	8,764.045	9,797.753	487.0267	7.01
2018	4,895	50	1,088.757	9,230.769	10,319.53	515.9763	10.54

The number of international students, thousand people, 2012-2018: http://portuguese-american-journal.com/2019-universities-to-add-2500-placements-for-international-students-portugal/
http://migrationdataportal.org/?t=2017&cm49=620&i=stud_out_
The volume of direct foreign investment, 2013-2018:
http://unctad.org/system/files/official-document/wir2019_en.pdf
The volume of direct foreign investment, 2012:
http://unctad.org/system/files/official-document/wir2016_en.pdf
Annual tuition fee for international students and the amount of monthly expenses by international students, Euro: http://mastersportal.com/articles/1095/tuition-fees-and-living-costs-for-international-students-in-portugal.html

Appendix 4. Average currency exchange rates

Year	Dollar / Rouble yearly average exchange rate	Dollar/Yuan yearly average exchange rate	Dollar/Pound yearly average exchange rate	Dollar/Euro yearly average exchange rate	Dollar/Indian rupee yearly average exchange rate	Dollar/Brazilian real yearly average exchange rate
2011	29.3929	6.46	0.625	0.72	49.095	1.72
2012	31.0734	6.3	0.63	0.785	52.98	1.915
2013	31.8496	6.15	0.64	0.75	60.48	2.2
2014	38.4667	6.16	0.61	0.77	61.06	2.465
2015	61.2946	6.35	0.66	0.885	64.19	3.375
2016	67.1899	6.7	0.745	0.915	67.48	3.63
2017	58.3086	6.69	0.785	0.89	65.96	3.215
2018	62.6906	6.61	0.75	0.845	68.845	3.68

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