Socio-economic integration and social citizenship of migrants: empirical analyses

Boffi, G.

5 The Economic Impact of International Students in OECD Countries: a Review of the Literature and New Empirical Evidence[1]

Abstract

In this chapter, I review the available empirical evidence on the economic impact of international students in receiving OECD countries. To start, I survey the existing literature and evaluate the three main approaches used to calculate the income gains for the host country: the export approach, the input-output approach, and the general equilibrium approach. Moreover, I also include literature addressing broader economic effects, such as the impact on local and national labour markets, technological innovation, and regional and national economic growth. Finally, using national accounts data from the OECD, I present new descriptive evidence on the consequences of the Covid-19 pandemic for international student enrolments and revenues. Both the literature review and the descriptive analysis provide a novel contribution by bridging the gap between the evidence available up to the Covid-19 pandemic and the most recent developments in the economics of international higher education. In doing so, I explore the implications of the pandemic for the economic impact of international students in receiving countries and set the ground for future work.

5.1 Introduction

The increasing opportunity for higher education students to enrol and study in foreign, often distant, countries is a well-known effect of globalisation. The presence of international students in higher education yields vari-

1 This chapter is based on a study expected to be published as Boffi (2025). The study is based on a continuation of my contribution to OECD (2022). I am grateful to Eduard Suari-Andreu, Olaf Van Vliet, Sabrina Genz, as well as participants to the work-in-progress seminar series of the Department of Economics at Leiden University on February 22nd, 2023, and participants at the 5th International Conference on European Economics and Politics organised by the Network for European Studies on June 20th, 2024, for comments on a previous version of this paper. A special acknowledgement goes to the members of the International Migration Division at the OECD for their support during my collaboration in 2022. The study upon which this chapter is based is part of the research programme Social Citizenship & Migration at Leiden University.

ous benefits for both the sending and receiving countries (Chevalier, 2022).[2] Through cultural exchange, economic stimulation, and human and social capital accumulation, international students contribute to global mobility, intercultural understanding, and socio-economic development (Levent, 2016; Morris-Lange, 2019). This study reviews the literature on the economic impact of international students in OECD countries and provides new empirical evidence on the subject. The focus on OECD countries is motivated by the fact that they host more than two-thirds of all international students globally and generally have better data for analysing enrolments and revenues.

In the early months of 2020, before the Covid-19 pandemic would temporarily disrupt international education and mobility, the number of international students enrolled at tertiary institutions globally had reached the record figure of 6.4 million (UNESCO, 2024).[3] Out of these, almost 4.4 million were enrolled in OECD countries (68% of the total), up from 2.8 million in 2013.[4] The latter is the first year for which internationally comparable data for OECD countries are available. Even in 2021, the most challenging year of the pandemic, total enrolments, which are calculated by summing all new international student enrolments in the OECD, did not experience a large drop but only a modest 1.4% decrease. Instead, the average per-country change in enrolments, which is calculated by taking the unweighted mean of all changes in enrolments across OECD countries from one year to the next, was a 4.4% increase (OECD, 2023).[5]

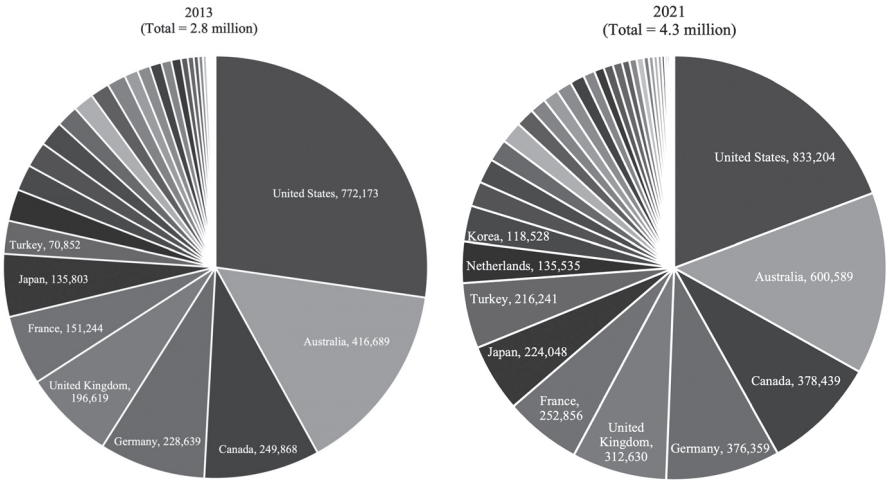
2 International students are defined as individuals who move out of their home country to pursue an entire degree abroad (degree mobility). They are a different group from students who move abroad for just part of their home country-based degree (credit mobility), like students in the European Erasmus programme (OECD, 2022).

3 Tertiary institutions include research universities, universities of applied sciences, colleges, and all other educational establishments that issue state-accredited post-secondary degrees at ISCED 2011 levels 5 to 8.

4 Revenues and enrolments data peak in 2020 because they usually refer to the academic year 2019-2020, which in most OECD countries started in the fall of 2019, when Covid-19 had not spread yet. However, in a few countries, the academic year 2020 started between February and April 2020, i.e., the early phase of the Covid-19 pandemic. This is the case in Australia, Japan, Korea, and New Zealand. Australia and New Zealand, two of the major recipient countries of international students, recorded a large decline in student enrolment already in 2020, while most of the countries showed sizeable drops only from 2021.

5 As explained in Section 5.4, major recipient countries, like Australia and New Zealand, experienced significant drops in international student enrolments during the Covid-19 pandemic, because of geographical distance from origin countries, institutional policies, and lockdown measures. Instead, several smaller countries, mostly European ones, experienced positive rates of growth, because of various factors. Then, it follows that total international student enrolments in the OECD decreased while the average per-country change was positive.

Figure 5.1 Enrolments of international students in OECD countries in 2013 and 2021



Source: author's elaboration from the data (OECD, 2023).

The growth in international students from 2013 to 2021, as shown in Figure 5.1 above, has deep economic implications for both the sending and receiving countries. Several countries that experienced a consistent increase in the intake of international students in both absolute and relative numbers (such as Latvia, the Netherlands, and New Zealand, whose shares of international students as part of their total enrolments increased from 1.5%, 4.3%, and 14.3% to 10%, 12%, and 20.8%, respectively) have also experienced sustained growth in direct revenues. These revenues come from tuition fees and non-tuition fee private expenditures by international students and their guests (OECD, 2022). Economic multipliers amplify these direct gains into indirect benefits, which vary by country due to factors such as the concentration of students in particular regions or cities, their labour market participation, and their impact on local businesses.

Recently, some host countries have contested the economic benefits brought by international students due to fears of crowding out local students, inflation, and a broader aversion towards immigration (Kayran, 2024; Mehdi et al., 2023). Debates in countries like Denmark and the Netherlands on limiting quotas and enrolments of international students spotlight the tension between economic benefits and local resource strains (Jæger, 2023). Denmark initially reduced English-taught programmes in 2018 to cut costs and prioritise domestic students but reversed this policy in 2023 due to labour shortages and the significant economic contributions of international students (ICEF Monitor, 2024). Similarly, the Netherlands faces housing shortages and overcrowded lecture halls, prompting ongoing discussions on stricter regulation (Staatscommissie Demografische Ontwikkelingen 2050, 2024). This study contributes to the debate by reviewing the available literature on the economic impact of international students in receiving

OECD countries and by providing new descriptive empirical evidence for the period until 2020 and during the Covid-19 pandemic.

Most of the available studies on the subject have focused on the economic impact on the host country, often just on the direct flows of income from international students to public and private parties, rather than on a full cost-benefit analysis. This is due to the clear interest of host countries in measuring the revenues resulting from the export of national education to foreign buyers (international students) and its effect on domestic markets, industries, and consumers. International education is then seen as a service export and a potential source of revenue. Moreover, estimating the impact on the sending countries poses further challenges, particularly in measuring the cultural and income remittances by international students and their return rates (Chevalier, 2022).[6]

In the literature, there is a distinction between studies that focus solely on the income received from international students in the host country and those that also examine broader dimensions, such as labour markets and broader societal effects. The various components of the income effect of international students on the host country, both during their studies and after, are most often estimated using one of three popular methods: the export approach, the input-output approach, and the general equilibrium approach. In short, the first method focuses exclusively on the direct income gains from international students during their studies. Additionally, the second and third methods also try to account for the indirect income effects during and after studies. However, they do so at the cost of making strong assumptions about economic multipliers, retention rates, and other factors.

A precise calculation of the direct income contribution during studies encompasses three components: income from international tuition fees, income from non-tuition fee private expenditure by international students, and income from private expenditure by guests of international students (London Economics, 2023; OECD, 2022). Each of these three direct components is then associated with indirect effects throughout the wider economy. In the case of income derived from the tuition fees paid by international students, the indirect effects come from the universities' expenditure on staff, facilities, and services. For example, this type of indirect gain was estimated to be close to €1 billion in Spain in the academic year 2018-2019 (0.08% of GDP) (Grasset and Menéndez, 2020). Non-tuition fee private expenditure by international students on accommodation, food, healthcare, transportation, and leisure activities also has important indirect consequences throughout the economy. For the academic year 2017-2018 in Sweden, international students generated an estimated SEK 2.4 billion through this type of indirect effect (0.05% of GDP) (Oxford Economics, 2020). Private expenditure from guests of international students, which was estimated to be around €470

6 On the return migration of international students, see Bijwaard et al. (2016).

million in France in 2014 (Campus France, 2014), also produces sizeable indirect effects, sparking local business activity.[7]

Measuring the income gains from international students during their studies involves a rather intuitive accounting exercise, at least for the direct components. However, calculating the non-income contributions, which typically develop in the longer term after graduation, is more empirically challenging. First, limitations arise from the difficulty in precisely estimating the number of international students staying in the host country after graduation, whether for family, partnership, work, or other reasons. The reasons why international students stay in the host country are often intertwined and difficult to disentangle (Aljohani, 2016). Second, even if it were possible to count every international student staying in the host country after studies, it is still necessary to make country-specific assumptions about future labour force participation, productivity, and return rates at a later stage. For example, a forecast commissioned by the Australian government in 2015 estimated that, among all international students, around 130,000 (22% of the total) would later settle in the country and increase the labour force with tertiary education by 3% (Deloitte Access Economics, 2015). Recent changes in higher education and international mobility, such as the considerable drops in enrolments and revenues from international students in Australia during the Covid-19 pandemic, and the increase in remote-studying and working opportunities, make the prediction from 2015 now outdated.

Analyses of the costs imposed by international students on the receiving country are surprisingly rare. The costs imposed by international students can be classified as direct and indirect as well. Direct costs include expenditures incurred by governments to attract and subsidise international students, such as scholarships and grants. For students from middle- or low-income countries, these are often classified as Official Development Assistance (ODA) and reported in national accounts statistics. The rationale behind including these in a country's ODA is that international students will return home with additional social and human capital, which contribute to development (Amanzadeh et al., 2024). This rationale has been questioned in recent years, given the enhanced efforts of most OECD countries to retain international graduates in the host country (OECD, 2022). Indirect costs include increased demand for housing, transportation, and public services, potential inflation, and administrative and regulatory expenses, all of which can strain the host country's resources and infrastructure. The

7 Indirect effects are described in the main text as positive externalities coming from the direct economic behaviour of international students (and their guests). However, from a general equilibrium point of view, it is also possible to suppose that the economic activity of international students has complementary and undesired adverse consequences, like higher inflation in university cities and a reduction in available housing. To this date, no studies in the literature have tried to quantify potential negative effects. This remains an open debate, with insufficient empirical evidence on the subject.

rarity of such analyses can be attributed to the difficulties in accurately quantifying these costs and the prevailing focus on the economic benefits of international students.

Given this premise, the literature review and analysis of this study focus on the economic impact of international students on the host country, particularly in terms of the benefits they bring. My approach aligns with the prevailing interest in understanding the economic gains associated with attracting and retaining international students, while paying more limited attention to the costs. The contribution of this study to the aforementioned literature is twofold. First, it provides a review of the available empirical evidence from the literature until the beginning of the Covid-19 pandemic in 2020. The literature available up to this date lacks a comparative overview of the concepts, the methodologies, and the findings of each study on the economic impact of international students on the receiving countries. Moreover, the available studies, like OECD (2022) and the majority of country-specific policy reports, often do not distinguish between income gains and broader economic implications. Finally, as the available cross-country evidence on the effect of Covid-19 on higher education is scarce, this study addresses the question of how the Covid-19 pandemic has impacted enrolments and direct revenues from international students. Answering this question is key to bridging the evidence available until 2020 to the developments in the present decade and beyond. In doing so, it prepares the ground for future work when post-Covid-19 data will become available.

To address the question of the impact of Covid-19 on the economic contribution of international students to the host country, I perform a descriptive analysis of OECD data on the changes in enrolments and direct revenues from international students, with enrolments data available up to 2021 and revenues data available up to 2022. As mentioned above, total enrolments in the OECD did not experience a considerable drop during the pandemic (-1.4% from 2020 to 2021). In contrast, there was an average decrease of 23.1% in direct revenues from international students across countries already from 2019 to 2020. In 2020-2021, the downward trend in revenues persisted, although it was less severe compared to the previous year. The average change across countries in this period was -11.2%, indicating a partial recovery in some countries, but still reflecting the lingering effects of the pandemic. By 2021-2022, a mixed picture of recovery and persisting negative effects emerged. Several countries, including Austria, Czechia, and Italy, demonstrated remarkable growth in revenues, displaying strong rebound effects. Others, like Australia and New Zealand, still lagged behind. Overall, the total change in direct revenues from international students in the OECD from 2019 to 2022 was a decrease of 20.6%, with high country heterogeneity.

The rest of the chapter is structured as follows. Section 5.2 reviews previous studies on the subject and compares the three main techniques employed for the calculation of the income contribution of international students to the receiving country: the export approach, the input-output

approach, and the general equilibrium approach. Section 5.3 continues with the literature study by discussing broader dimensions of the economic impact of international students on the receiving country, such as effects on local and national labour markets, technological innovation, and regional and national growth. Section 5.4 presents new descriptive evidence on the impact of Covid-19 on the enrolments and the revenues from international students in OECD countries. Section 5.5 discusses implications from the findings and concludes.

5.2 Review of the Methodologies Applied in the Literature

Previous evidence on the economic impact of international students on host countries comes mostly from country-specific studies. These studies are often undertaken by education ministries (in Australia, Canada, Denmark, and New Zealand), national statistical or policy institutions (in Australia, Belgium, Estonia, Finland, and the Netherlands), national university associations (in Australia, France, and the United States), or commissioned by the government to private parties, often economic consulting firms (in Australia, Austria, Belgium, Canada, Germany, Ireland, Latvia, Poland, Spain, Sweden, and the United Kingdom). Unfortunately, these studies are typically commissioned only once – often for a single academic year – and are not regularly updated (Sá and Sabzalieva, 2018).

For example, evidence from Germany, one of the main destination countries for international students in continental Europe, is limited to only one study from 2013 (Prognos, 2013).[8] This reduces the external validity of the findings and their relevance over the years as international education evolves. Most importantly, the research focus is often solely on the direct income gains from international students due to the difficulties in estimating the broader post-study economic impact and the short-term scope of such analyses. Finally, most of these studies are strictly policy-oriented rather than academic in nature.

The OECD host countries for which the economic impact of international students is most frequently assessed are all the English-speaking countries. This is likely due to the large revenues that such countries receive from the attraction and retention of international students (OECD, 2022). Among these, Australia has yearly reports and statistics on the income gains at the regional and national level, while Canada and New Zealand have both several reports periodically updated by private parties and education ministries. The United Kingdom has also a mix of governmental and private studies on the topic, and for the United States, the National Association of Foreign Student Advisers (NAFSA) provides figures and statistics every year since 2003. For example, recent figures estimated $47

8 An update of the German study is due by the end of 2024.

billion in educational-services exports in 2019 (2.0% of total exports), more than the national exports of income management services (Nafsa, 2023). For Australia, in the same year, the Australian Bureau of Statistics estimated AUD 40 billion in revenues from the exports of education-related services (8.5% of total exports and 2.0% of GDP), more than the revenues from gold exports (Australian Bureau of Statistics, 2022).

In Europe, more than one study has also been carried out for Belgium (particularly for the Flanders region), Estonia, Finland, France, Ireland, the Netherlands, Spain, and Sweden. In Austria, Denmark, Germany, Hungary, Poland, and Switzerland only one study has been carried out so far. To this date, 17 out of the 38 OECD countries, Chile, Colombia, Costa Rica, Czech Republic, Greece, Iceland, Israel, Italy,[9] Korea, Lithuania, Luxemburg, Mexico, Norway, Portugal, Slovak Republic, Slovenia, and Turkey have neither policy reports nor academic studies precisely quantifying the economic impact of international students in the country.

All the aforementioned studies adopt one or more of the three main approaches to estimate the income contribution of international students: the exports approach, the input-output approach, and the general equilibrium approach. A short summary of the pros and cons of each approach and the countries for which it has been employed is provided in Table 5.1 below.[10]

9 In November 2023, Uni-Italia and the Italian Ministry of Foreign Affairs and International Cooperation organised the *4th Conference with International Higher Education Agencies* on *The economic impact of international students*. Despite Italy remaining one of the main destination countries for international students in Europe, so far, the research on their economic impact in the country is limited to survey evidence from a few university cities (Uni-Italia, 2023).

10 The focus of the literature review is mostly on the studies and reports written in English. For a detailed overview of recent studies on the economic impact of international students on host OECD countries, see Table 5.2 at the end of the chapter.

Table 5.1 Main methods to calculate the income gains from international students in the host country

	PROs	CONs	Countries for which it has been employed
Exports Approach	Precise account of the direct revenues. The estimates are comparable across export sectors and across countries.	No account of indirect effects and the long-term impact.	Australia, Estonia, Finland, France, Ireland, New Zealand, United States
Input-Output Approach	In addition to direct effects, indirect effects and interdependencies between sectors are considered.	In estimating indirect effects and the long-term impact, it does not account for resource scarcity, time lags between the effects, and rising input prices. These may lead to an overestimation of the benefits.	Canada, Finland, Germany, Hungary, Latvia, The Netherlands, New Zealand, Poland, Spain, Sweden, United Kingdom
General Equilibrium Approach	Direct and indirect effects across sectors and regions can be estimated in the short and in the long term.	Expensive and time-consuming to be built, less easy to update. Based on country-and-year specific assumptions.	Australia, Belgium

Source: author's elaboration from the literature.

5.2.1 The Export Approach

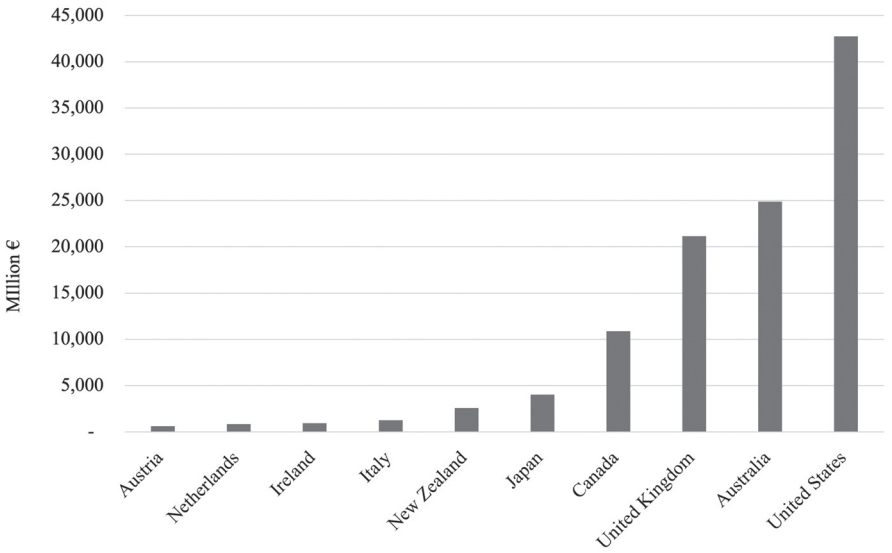
The exports approach relies on trade statistics from the national balance of payments of the host country to calculate the direct income contribution of international students to the economy. In its simplest form, the contribution is calculated by adding up the statutory tuition fee and average non-tuition fee expenditure per international student (and their visitors) and multiplying the result by total enrolments.[11] This first approach, despite being rather superficial (most importantly, indirect effects are not considered), is quite precise in providing accounting figures on direct contribution to public finances. For this reason, the OECD (2022) adopts it for its most recent analysis of the direct revenues of international students from 2010 to 2019.

11 Tuition fee expenditure is directly taken from the balance of payments of higher education institutions. Instead, non-tuition fee expenditure per international student is an approximate measure imputed by the host country's statistical authority based on the consumption behaviour of the average international student. Therefore, it might be less accurate than tuition fee expenditure.

This analysis uses statistics on the exports of education-related services, including expenditures for tuition, food, accommodation, local transport, and health services by international students adopting the 2010 Extended Balance Of Payments Services classification (EBOPS).[12]

The figures showed a general growth in revenues across most OECD countries, with total revenues from the exports of education-related services in the OECD area increasing from €47 billion in 2010 to over €110 billion in 2019 (OECD, 2022). English-speaking OECD countries appeared as the industry leaders. The United States, Australia, the United Kingdom, Canada, and New Zealand ranked as the top five countries by gross revenues, making up more than 80% of the total revenues from the exports of education-related services in the OECD in 2019 (Figure 5.2 below).

Figure 5.2 Top-ten country by direct revenues from international students (million €), 2019



Source: author's elaboration from the data (OECD, 2023).

Notably, the United States and Canada more than tripled their absolute values over the past decade, while Australia, New Zealand, and the United Kingdom almost doubled them. In Europe, the Central, the Eastern, and the Baltic countries have experienced significant increases in their education-related services exports, often doubling or tripling from 2010 to 2019.

An advantage of this first approach is that it makes the exports of education-related services comparable to other export industries and as a percentage of total exports. The OECD (2022) reported that despite the strong increases several countries have experienced in absolute values from

12 The comparability of the data across countries is ensured by the common adoption of the 2008 System of National Accounts (SNA).

2010 to 2019, the exports of education-related services account for below ten percent of total exports in all OECD countries in 2019. Once again, the English-speaking countries were the ones where educational exports represent the highest shares of total exports. Finally, in all countries, direct revenues from international students accounted for 0.2% or less of GDP in 2019, except for the United Kingdom, Canada, New Zealand, and Australia, where they accounted for 0.6%, 0.6%, 1.4%, and 2.1% of GDP, respectively.

Within the country-specific literature, the export approach is employed yearly by the National Association of Foreign Student Advisers (NAFSA), the national authority studying and promoting the attraction of international students to the United States. The Ministry of Education of New Zealand adopts the export approach too. In 2019 it was calculated for instance that international students generated more than NZD 4.8 billion in direct revenues (1.5% of GDP). This makes it the fifth largest export industry in the country, more than the wine industry and the air transport industry combined (New Zealand Education, 2020). In Europe, estimates for Ireland showed that revenues from the exports of higher education contributed €336 million to the Irish economy in the academic year 2017-2018 (0.1% of GDP) (Indecon International Economic Consultants, 2019). For France, the latest estimates showed that international students directly contributed €5 billion to the French economy in 2022 (almost 0.2% of GDP) (Campus France, 2022).

A major limitation of the export approach is that it lacks any estimate of indirect effects from the private expenditure of international students (and their guests) throughout the economy. Moreover, given that it is based on the trade statistics of a specific year, through an export approach it is not possible to calculate the future economic contribution of international students. The input-output and the general equilibrium approaches are used to calculate indirect effects and the long-term impact.

5.2.2 The Input-Output Approach

In addition to the direct income contribution, the input-output approach also estimates indirect effects by using economic multipliers (such as those from OECD input-output tables) to mirror the interdependencies between various sectors of the economy. In this way, it can deliver a more detailed assessment of international students' income contributions at the regional level and over time. For instance, the input-output approach captures how an increase in international students in a particular geographical area leads to an increase in local housing expenditure.

This approach has been widely adopted in several countries. Estimates for the 2015-2016 academic year in Latvia showed that the total income contribution of international students to the economy was €148 million (0.5% of GDP) (Domnïca Certus, 2016). In the same academic year, the United Kingdom received a net contribution of GBP 23.6 billion from international students, which rose to GBP 28.2 billion in 2018-2019, and to GBP 37.4 bil-

lion in 2021-2022 (1.7% of GDP). The increase was mostly driven by growth in tuition fee income from international students (higher fees and a larger cohort) (London Economics, 2023).[13] For Spain, it was estimated that the income contribution of international students in the academic year 2018-2019 was more than €3.5 billion (0.3% of GDP) (Grasset and Menéndez, 2020).

A serious limitation of this approach comes from the assumption that local and national industries can freely (and infinitely) adjust their supply in response to international student-driven demand. This assumption ignores real-world economic constraints. For example, the price of inputs should increase, time lags apply, and scarcity regulates the availability of resources. Time lags refer to the delay between an increase in demand in a sector and the corresponding increase in supply. For instance, if a significant number of international students suddenly move to an area, it may take time for the local housing market to build additional accommodations or for local businesses to expand their services to meet the new demand. These delays can result in temporary shortages and increased prices, which are not accounted for in the input-output approach. Therefore, this approach tends to overestimate the indirect economic contribution of international students. Furthermore, most of these assumptions are country-and time-specific and do not allow for comparisons across countries and over time.

5.2.3 The General Equilibrium Approach

Finally, the last approach uses general equilibrium (GE) models to account for interdependencies between various sectors of the economy without double counting the impacts that private expenditure by international students can have across sectors and allowing for resource scarcity and time adjustments. By modelling time lags, expected stay rates, and behavioural responses of different economic sectors, GE models can estimate the impact of changes in the number and the contribution of international students, immigration policies, and technology, in both the short and long run.

This approach was recently used in a detailed report on the regional economic impact of international students in Australia in 2018, where total national export revenues of AUD 34 billion (1.8% of GDP) were broken into their regional components. In the same report, the International Educational Education of Australian also forecasted an AUD 715 million real GDP con-

13 Because of Brexit, from the 2021-2022 academic year onwards, international students from the EU in the UK are subject to full international fee rates instead of the reduced home fee rates. As expected, this had a dramatic impact on the influx of EU students. London Economics (2023) reported that 92% (350,145) of international first-year students in 2021-2022 were from outside the EU (a 68% increase since 2018-2019), with only 8% (31,220) from the EU (a 52% decrease since 2018-2019). Unfortunately, 2022 data for international student enrolments in all OECD countries are not available yet. It remains to be seen whether Brexit will produce spillover effects on other host countries, altering the composition and the size of their pool of international students.

tribution from international students to the Gold Coast region in the long run (International Educational Association of Australia, 2019). Using data for the academic year 2015-2016, De Witte and Soncin (2021) estimated the income benefits of international students in the Flanders regions of Belgium in both the short term and the long term. In the short term, international students contributed €57 million in tuition fees, €630 million in non-fee private expenditure, and €139 million in expenditure from visitors, totalling 0.2% of GDP. Long-term benefits were driven by the 52.8% retention rate of international graduates, whose employment contributed between €4.2 billion to €5.6 billion to the regional GDP. Finally, the analysis revealed that the benefits of international students in Flanders exceeded the costs by a factor of 2.4 to 3.1 times (De Witte and Soncin, 2021).

Even though GE models can provide estimates of the economic impact of international students on virtually every sector of the economy, they are used less frequently than exports or input-output analyses. This is because they suffer from several limitations. First, they require more effort and time to be built and fine-tuned compared to export or input-output models, and thus, they are updated less often. Second, they involve a high degree of complexity and must be tailored to each single national economy to fully capture the behaviours of its economic agents. Third, they tend to assume fully rational behaviours of the parts involved, complete preferences, and full information, resulting in outcomes that may not withstand the test of time. For example, the aforementioned Australian study could not foresee the impact and the changes that the Covid-19 pandemic would have had on the attraction, retention, and future employment of international students in the country the following years.

5.3 Beyond the Income Gains: Other Focus Areas in the Literature

The economic impact of international students on the receiving country extends beyond the direct and indirect income gains discussed in Sections 4.2 to 4.2.3. With different methodologies, studies in the literature have focused on several other economic aspects in both the short and longer run. Among these, the most immediate economic effects are found in the labour market inclusion of international students, during and after their studies. In the longer run, international students also contribute to technological innovation – a key factor for the development of any advanced capitalistic economy – and ultimately to broader economic growth. The methods employed for the calculations of such effects include (but are not limited to) input-out analyses and GE models, while exports analyses are mostly excluded, for the limitations discussed in Section 4.2.1.

5.3.1 Local and National Labour Markets

In most OECD countries, upon their arrival, international students can enter the host country's labour market automatically or with an additional permit.[14] Governments commonly support the attraction and retention of international students with various policies intended to provide businesses with a constant stream of young skilled workers.[15] However, international students can represent a sizeable shock to the labour force and the demographic composition of local communities (Borjas, 2005; Moskal, 2016). For these reasons, labour market effects are studied to formulate the best integration policies and help both employers and employees navigate the changes brought by the influx of international students.

The local labour market effects of the entrance of a large number of young migrants in the host country can be disruptive and long-lasting. On average, they rejuvenate the labour force, diversify it, and, overall, increase its size (Beine et al., 2022; Han et al., 2022). Through their non-tuition private expenditure, international students can also drive-up local demand and supply indirectly, creating jobs in specific industries, like housing, hospitality, and tourism. For example, through an input-output model, it was calculated that out of the estimated 2,900 jobs supported by international students in Sweden in the academic year 2017-2018, almost 30% were in the hospitality sector (Oxford Economics, 2020). For Hungary, in 2020, it was calculated that 96.7% of the employment generated by international students was concentrated in hospitality, real estate, transportation, and warehousing (Tempus Public Foundation, 2020).

Furthermore, if international students become active members of the labour force during their studies and/or after graduation they may even end up conditioning the local labour demand. For instance, student cities often have jobs in which host country language proficiency is not required, making it easier to hire international students. For example, employers in university cities in the Netherlands like Amsterdam, Utrecht, and Rotterdam frequently do not require Dutch language proficiency for entry-level and part-time jobs (Centraal Planbureau, 2019). In addition, depending on their level of education and field of study, international students may concentrate in specific high-skilled occupations.[16] The United States provides a notable example of this. There, about 9.5% of the high-skilled labour force in

14 The type and the duration of the permit issued to international students to work during studies impact not only the quantity, but also the quality (in terms of grades), of the international students that enrol in the host country. For further evidence, see Amuedo-Dorantes et al. (2020) and Dam et al. (2018).

15 The skill level of international students depends also on whether they are bachelor's, master's, or PhD students.

16 Han et al. (2022) conducted a critical review of the factors influencing the integration of international students in the host country's labour market after graduation. These included host country cultural knowledge, language fluency, motivation, family structure, and immigration status.

2014 was made up of individuals who first entered the country on a student visa and then transitioned to a temporary or permanent work visa. In the IT sector, the share was significantly higher at 15.7% (Bound, 2015). In Europe, Estonia presented a similar picture, as evidence from 2020-2021 showed that international students who stay in the country upon graduation tended to concentrate in IT, engineering, manufacturing, business, and administration jobs (Statistics Estonia, 2022).

These local and sectoral developments are felt also at the national level. Estimates show positive effects on the total number of jobs created by international students in several OECD countries over the years. Through the application of an input-output approach to national statistics on enrolments and survey data, comparative evidence for Austria, Germany, the Netherlands, Poland, Spain, and Switzerland showed that in 2011, for every 10 international students, 1.5 jobs were created in Austria (5,000 overall), 1.4 in Germany (22,000 overall), 1.5 in the Netherlands (8,000 overall), 2.3 in Poland (5,700 overall), 1.6 in Spain (11,500 overall), and 1.8 in Switzerland (4,100 overall) (Prognos, 2013). More recent findings from Latvia showed that every 10 international students supported about 2.7 jobs (1,474 jobs overall) in the 2015-2016 academic year (Domnïca Certus, 2016). For the United States, the country accounting for around 20% of all international students in the OECD area, the figures showed that international students supported 306,308 jobs through their expenditure in the academic year 2020-2021 (0.2% of the total jobs in the country). In other words, for every 10 international students, more than three jobs were supported in the United States through expenditure on accommodation, food, retail, and transportation sectors (Nafsa, 2023). This finding on the expansion of the labour supply caused by international students is corroborated by recent evidence from Beine et al. (2022). They showed that an additional international graduate increases the local supply of skilled workers by about 0.2 workers, as they tend to stay in their state of study.

In other major recipient countries like Australia and Canada, international students made up about half of all temporary workers in the national labour force in 2017. The OECD (2018) showed that, in full-year full-time equivalent (FY/FTE) terms, international students made up 1.3% of all workers in Australia and New Zealand, and 1.1% in Canada. In the other countries, their maximal potential contribution was 0.4% or less. Given the limits some countries place on the maximum number of hours international students can work during courses and study breaks, like 20 hours per week during courses in Australia, Canada, and New Zealand, it is more difficult to estimate the exact contribution of international students to the employed population. In a recent calculation, the OECD (2018) assumed that the average international student worked 25% of the maximal hours of work allowed per year by the permit rules. Following this assumption, in Australia, Canada, and New Zealand students added up to 0.4% of the employed population, and 0.1% or less in other countries.

However, as classical economic theory would predict, when international students enter the labour market, they may also produce negative spillover effects on natives. Governments may be concerned that intra-sectoral labour market shifts may lead to the displacement of native-born workers (i.e., international graduates become more appealing to local businesses and act as substitutes of natives) (Card, 2001; Kerr and Kerr, 2011). Early research for the United States looked at the impact of the rising share of doctorates awarded to international students – interpreted as an exogenous labour supply shock – had on the salaries of competing workers, whether foreign-born or not. As the theory on intra-sectoral labour shifts would predict, an exogenous increase in the supply of foreign students showed a significant negative effect on the earnings of competing workers. As a consequence, fewer Americans may decide to look for jobs in fields dominated by international graduates, like IT (Borjas, 2005).

For Italy, instead, more recent findings showed that international education boosted the employment probabilities and the career perspective of Italian undergraduate students upon return to the home country (d'Hombres and Schnepf, 2021). Despite higher employment, there was also evidence that international students, often during studies, take up jobs in the hospitality and catering sectors that Italian native-born individuals would not choose, favouring the development of a de-facto dual labour market (Brandi et al., 2012). Similar disparities between the jobs of international students and natives were found also in Germany and Japan, where, at the national level, international graduates seemed to be employed in less-rewarding professions that native-born peers preferred not to perform (Liu-Farrer and Shire, 2020).

In conclusion, the influx of international students significantly impacts local and national labour markets in both the short and long term. In the short term, their non-tuition expenditure boosts local demand and support jobs in industries such as housing, hospitality, and tourism. In the long term, their integration into the labour force enlarges the supply of skilled workers, especially in fields like IT, engineering, and business. Although there can be potential negative spillover effects on native workers, the overall expansion and diversification of the labour market brought about by international students contribute to economic dynamism and growth.

5.3.2 Technological Innovation

The impact of skilled immigration on technological innovation is a long-researched topic, with evidence of positive effects (see seminal work by Bottazi and Peri (2003) and more recent evidence from Bernstein et al. (2019), OECD (2024a), and Ortega and Peri (2014)). As the population of international students has steadily increased since the 2010s, new literature has begun to assess the contribution of this growing type of skilled migrants to technological innovation. International students represent a specific subset of young skilled migrants who can contribute to technological innovation

both directly and indirectly, given their relative high employability. They often bring diverse perspectives, different abilities, and knowledge from their home countries, enriching the business environments of the host countries.[17] This diversity encourages creativity and novel approaches to problem-solving, which are fundamental for technological progress. Furthermore, international students frequently participate in advanced research projects and collaborative ventures with local industry, during and after their studies, directly contributing to innovative outputs (Beine et al., 2022).

Higher education institutions and international companies argue that their ability to make profits, develop knowledge, and, in the longer term, contribute to technological innovation depends also on unbound access to the brightest students they can attract (Bound et al., 2021). Technological innovation as an indirect outcome of increasing internationalization in higher education is usually measured by the number of new patents filed in a university city or by the research output associated with rising enrolments of international students. As expected, generally master's and PhD students produce bigger effects than bachelor's students (Hunt and Gauthier-Loiselle, 2010).

In the United States, the presence of international students in higher education and the possibility of innovation spillovers have received considerable attention. Early evidence found that the rising labour market participation of international students had a significant positive impact on both future patent applications and future patents awarded to university and non-university institutions. More specifically, a 10% increase in the number of international graduate students raised patent applications by 4.5%, university patent grants by 6.8%, and non-university patent grants by 5.0% (Chellaraj, 2008). For PhD students in science and engineering (S&E) – two fields closely tied to innovation and with disproportionately higher participation of international students, particularly from China and India – both domestic and international students significantly increased the scientific output of higher education institutions (Center for Security and Emerging Technology, 2020; Stuen et al., 2012). Notably, the effect is found to be strongly positive for high-performing international students, such as those who benefit from merit-based scholarships (Stuen et al., 2012). For the specific subpopulation of Chinese doctoral students in Science, Technology, Engineering, and Math (STEM) in the United States – approximately 36,000 individuals in the academic year 2018-2019 (Feldgoise and Zwetsloot, 2020) – it was estimated that, on average, they performed as well as or better than the very top native students, with a strong record of publications during their doctorates (Gaulé and Piacentini, 2013).

The matter has received somewhat smaller attention in other countries, with mixed findings. In Canada, where the points-based immigration

17 The knowledge and the culture that international students bring with them depend also on their country of origin.

system aims at attracting the most talented workers from abroad, STEM graduates generated lower patenting rates than corresponding native-born students and STEM graduates in the United States (Blit et al., 2020). The more modest contribution of Canadian immigrants is possibly explained by the fact that only one-third of Canadian STEM-educated immigrants found employment in STEM jobs, compared to two-fifths of the Canadian-born and one-half of US immigrants (Blit et al., 2020).

Further evidence from Australia, Spain, and the United Kingdom suggests that an initial study experience works as an effective trampoline toward entrepreneurship and innovation. A recent study from Australia looked at the effect of a skilled visa program allowing international graduates from higher education institutions to temporarily live and work in Australia on innovation outcomes at the regional level. The findings showed a positive impact of the visa program on the number of patent applications, indicating a positive effect of the skilled immigration visa program on regional innovation (Crown et al., 2020). For international students from Spain, it was found that participating in the Erasmus programme, i.e., credit mobility, had a positive effect on the probability of becoming an entrepreneur upon return and on IT skills formation (Conti et al., 2016). Similarly, for the United Kingdom in 2014, it was estimated that 60% of international students were more likely to become entrepreneurs in the host country as a result of studying there (London Economics, 2023).

In sum, international students significantly contribute to technological innovation in their host countries through their diverse perspectives, specialised skills, and active participation in research and industry collaborations. Their presence in higher education institutions has been linked to increased patent applications and augmented scientific output, particularly in the STEM fields. While the impact varies across countries, evidence shows that international students drive technological advancement and foster entrepreneurship, with positive effects for economic growth beyond the mere income contribution.

5.3.3 Regional and National Growth

International students play a significant role in driving economic growth both regionally and nationally. Their presence in university cities opens immediate flows of income through tuition fees and living expenses, while their participation in the labour market and local economies stimulates job creation and business activity. Moreover, the skills and knowledge they acquire during their studies can lead to innovation and productivity gains, further enhancing economic development. By backing a multicultural and skilled workforce, international students help to create dynamic and competitive economic environments, which are essential for long-term growth and prosperity (Chevalier, 2022).

Generally, the changes brought by international students are mostly felt in university cities. Municipalities and metropolitan areas in the main

destination countries welcome international students to their universities to benefit from the spillover effects that these institutions spawn for the public and private sectors. In this way, international students can work as a powerful engine towards regional development. Capital cities like Auckland, London, Paris, and Tokyo, are at the core of international education. With a long history shaped by globalisation, they host some of the world's leading universities and a diverse mix of higher education institutions. These attract talented students, vitalise local economic activity, and supply businesses with an always-fresh pool of skilled workers.

In Auckland, revenues from international students amounted to NZD 2.2 billion in 2015 (around 64% of the national total), with over 16,000 jobs in the region supported by international students. No other region was comparable in absolute terms for international student numbers or earnings (Infometrics and National Research Bureau, 2016). Strong regional patterns emerged also in Canada, where, Ontario, the region with the highest number of international students in the country, made the largest contribution to national GDP in 2018 with 55.3% of the total (CAD 19.5 billion), followed by British Columbia with 19.8% and by Quebec with 11.9% (Global Affairs Canada, 2020). In Australia, where international education is the country's third-biggest export industry, in 2018, 97% of international students resided in the country's major cities, like Melbourne and Sydney (International Educational Association of Australia, 2019). This concentration of skilled migrants induces economic growth in the surrounding regions both in the short- and the long-run (Chowdhury, 2022).

In Europe, in the academic year 2013-2014, Paris and the surrounding Île-de-France region hosted 28% of all the international students in France (Campus France, 2014). For London, in the same academic year, the share was slightly lower at 22% (around 66,000 students). This meant that 18% of the city's total student population (366,605) was made of international students (London First and PWC, 2015). In addition, it was estimated that the city received GBP 2.8 billion in fees and non-fee expenditure from international students (0.8% of the city's GDP in 2014) (London First and PWC, 2015). Recent evidence from Hungary showed that between 72.4% and 90.5% of international students' spending was located in the country's four main university cities in 2020, with Budapest on top. The Hungarian capital was also the city where the effect of spending on employment was felt the most with 51.3% of the national employment impact being measured there (Tempus Public Foundation, 2020).

Estimating the overall effects at the national level is more challenging, as it involves the inclusion in the calculation of multipliers to model the impact of the economic effects from one region to others, through the methods discussed in Sections 5.2.2 and 5.2.3, for example (Levent, 2016). Bergerhoff et al. (2013) provided an early but critical contribution. They set up a two-country endogenous growth model to find that international student mobility increased national growth for both countries on average by 0.013 percentage points. These effects also varied by the sizes of the

two countries in the model. For example, a small country that receives a sustained inflow of students from a larger country could experience an extra growth of around 0.05 percentage points. This positive effect of international students on national growth are driven by mechanisms such as human capital accumulation, knowledge spillovers, labour market integration, and network effects. In turn, the positive effect of international students on national growth increases when a country designs its education and migration policy to facilitate the retention of international students and their integration in the labour market, as discussed in Section 5.3.1 (Bergerhoff et al., 2013).

A recent survey of the literature on international students and economic growth by Chevalier (2022) supports these findings. Most studies report positive growth effects for both sending – through income remittances and return migration – and receiving countries – through the mechanisms discussed above (Amanzadeh et al., 2024). Chevalier (2022) emphasises that the benefits of international student mobility extend beyond the immediate economic gains, contributing significantly to the long-term development and competitiveness of host economies, as discussed in Sections 5 to 5.3. The largest benefits are reaped by international students themselves, who gain valuable skills, knowledge, and global networks that enhance their career prospects and earning potential (Chevalier, 2022).

5.4 The Impact of Covid-19

Sections 5.2 and 5.3 have discussed the literature on the economic contribution of international students on the receiving country in terms of income received and more, emphasising their impact on the labour market, technological innovation, and overall economic growth. However, recent global events, including the Covid-19 pandemic, have introduced new dynamics and challenges to international higher education. This section examines how these changes have affected international student enrolments and revenues. As cross-country evidence on the economic effects of the pandemic on higher education is very limited, this section aims to provide a new valuable contribution to the literature.

In 2020, the Covid-19 pandemic came as an unexpected shock to international education and mobility, forcing most educational institutions to move at least part of their programmes online. Differences in the rates of contagion and in the governmental policies implemented to contain it had important repercussions on the decisions that educational institutions made in the academic year 2019-2020 and the following ones. Some universities were able to adapt quickly and move their full programmes online, while others lagged behind (Mbous et al., 2024; Van De Velde et al., 2021).

While Covid-19 vaccines started being deployed in most OECD countries since December 2020, the World Health Organization (WHO) declared the global health emergency caused by the Covid-19 pandemic to have

ended only in May 2023 (Reuters, 2023). This means that the academic years 2019-2020, 2020-2021, 2021-2022, and 2022-2023 are the ones at least partially impacted by the pandemic. Nonetheless, most high-income countries were able to go back to some forms of in-person education already from 2022 (Zhao and Xue, 2023). Thus, it follows that the most acute and immediate consequences of the pandemic are likely to be found in 2020 and 2021. Instead, the long-term impact on the modes of education, like an increase in online programs and remote teaching, and the well-being of the students, like the educational and social opportunities missed due to the lockdowns, may persist in later years.[18]

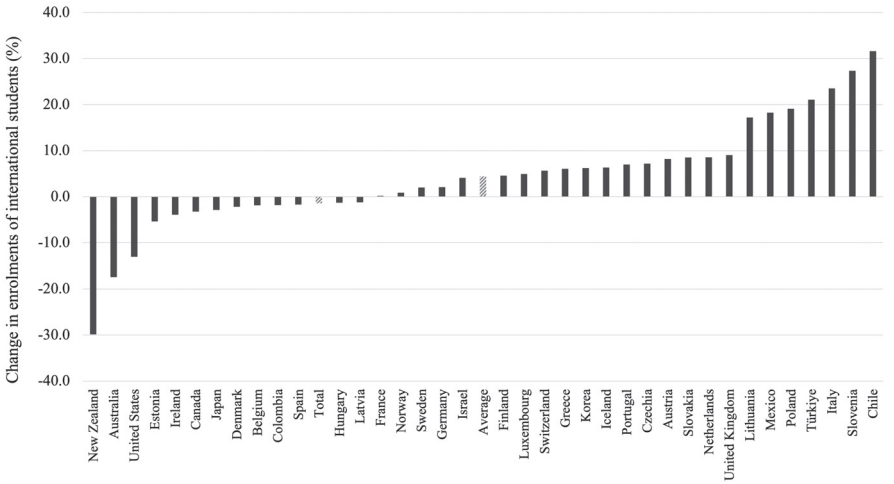
To conduct a descriptive analysis of the impact of the Covid-19 pandemic on international students, I study OECD data on the changes in enrolments and direct revenues from international students, with enrolments data available up to 2021 and revenues data available up to 2022. The enrolments data are from the OECD's yearly publication *Education at a Glance* (2023), where the variable 'enrolment of international students by country of origin' is included, but no analysis similar to mine is performed. The data on direct revenues from international students are from the OECD Statistics on International Trade in Services database (OECD, 2024b).

Before Covid-19, in the years from 2013 to 2019, the number of international students enrolled at tertiary institutions had grown at a rate of between 200,000 and 300,000 additional enrolments per year, both in more traditional and in more recent recipient countries (see Figure 5.1 in Section 5.1). From 2.8 million in 2013, until reaching the record figure of almost 4.4 million in 2020 (OECD, 2023). For most countries, enrolments statistics from 2020 refer to the academic year 2019-2020, which started in the fall of 2019, before Covid-19 became a pandemic. Therefore, the effects of Covid-19 on enrolments are captured from 2021, the first year fully impacted by the pandemic and by the measures government adopted to contrast it. Despite the significant disruption brought by the pandemic to the ordinary modes of instructions, international travel, and the well-being of the students and the staff, total international student enrolments in the OECD did not experi-

18 Most of the very recent literature on Covid-19 and international education has focused on the effects of the pandemic on the well-being of the students, as a particularly vulnerable migrant group, given that they often move with no established network in the host country. For cross-country evidence, see Van De Velde et al. (2021). For country-specific evidence, see Nguyen and Balakrishnan (2020) for Australia, Firang (2020) for Canada, Zhao and Xue (2023) for the United Kingdom, and Mbous et al. (2024) for the United States.

ence a considerable drop in 2021.[19] Instead, there was a more modest 1.4% decrease, with a high degree of cross-country heterogeneity.[20]

Figure 5.3 Changes in enrolments of international students (%), 2020-2021



Source: author's elaboration from the data (OECD, 2023).

Figure 5.3 above shows that the countries experiencing the biggest enrolment drops in 2021 were the usually-high-profiting English-speaking ones. New Zealand suffered a 29.9% drop, Australia 17.4%, the United States 13.0%, Ireland 3.9%, and Canada 3.3%. These downward movements signalled that, although higher education was a profitable export industry, it was not immune to external demand shocks (e.g., no international students available 'to buy' the host country institution's education). The reasons why these specific countries experienced bigger drops than others could have been purely geographical. The distance from destination countries like Australia, Canada, and New Zealand might have led prospective students from Europe and Asia to prefer enrolling in their home or neighbouring countries. Policy factors also played a role. For example, Australia and New Zealand closed their borders almost completely until late 2022.

In contrast to the decrease of the total number of enrolments, the average per-country change in enrolments, which is calculated by taking the unweighted mean of all changes in enrolments across countries, was a 4.4% increase (OECD, 2023). This is because, contrary to what could be expected,

19 Only countries like Australia and New Zealand, where the academic year started in the early months of 2020 when Covid-19 was already spreading, exhibited 10.0% and 17.6% decreases in enrolments in 2020.

20 As explained in Section 5.1, total enrolments are calculated by summing all new enrolments in the OECD. The average change in enrolments is calculated by taking the mean of all changes in enrolments across OECD countries, not weighted. The same calculation applies to total and average revenues.

several countries witnessed increasing enrolments in 2021. These included traditional recipient countries like Italy (23.5%), the United Kingdom (9.0%), and the Netherlands (8.5%), which were quick in moving courses and exams online, but also countries that became popular international student destinations more recently, like Chile (31.6%), Slovenia (27.3%), and Turkey (21.1%). It is noteworthy that out of the 25 European OECD countries, only 7 reported negative changes in enrolment, while 18 reported positive changes.

Geographical proximity is a known factor influencing the decision to move of international students (Vortisch, 2024). Given the geographical distance of prospective European international students from traditional destination countries like Australia, New Zealand, and the United States and that intra-European mobility remained relatively easy during the Covid-19 pandemic, it is possible that European international students preferred to enrol in a neighbouring country rather than traveling out of the continent.[21] Unfortunately, data for international student enrolments in 2022 and 2023 are not available yet and it is not possible to see whether these changes in enrolments endured also in the final years of the pandemic.

The aforementioned trends in international enrolments have had immediate repercussions on the revenues generated by international students in host countries through the direct and indirect effects discussed in Sections 5.1 and 5.2. To calculate the direct impact of international students on the economies of the receiving countries during the Covid-19 pandemic, I apply an exports approach, as described in Section 5.2.1. The method used for my analysis is the same as that adopted in the most recent cross-country study by the OECD (2022) and in several single-country studies by OECD member countries (such as Estonia, France, Ireland, New Zealand, and the United States). It involves comparing trade statistics from the national balance of payments of the host country to calculate the direct income contribution of international students to the economy. In its simplest form, the contribution is calculated by adding the statutory tuition fees and the average non-tuition fee expenditures per international student (and their visitors), then multiplying the result by the total enrolments.[22] This approach ensures immediate cross-country comparability of the statistics on the direct revenues generated by the export of education-related services to international students and includes both tuition fee income and non-tuition fee private expenditure, while excluding indirect effects.

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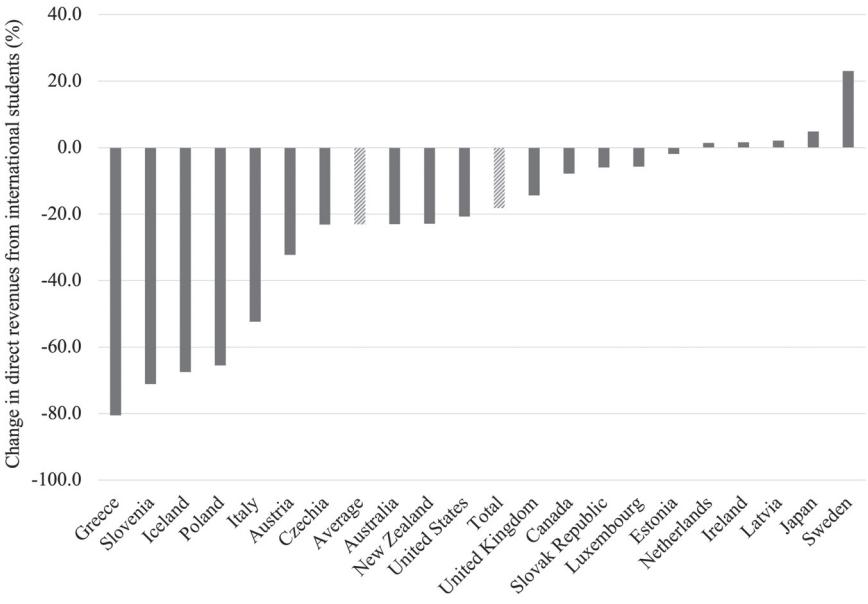
21 Given that most educational programmes had moved completely online by 2021, it is also possible that international students did not find it worthwhile to move to distant destination countries to attend classes exclusively online.

22 As explained in Section 5.2.1, tuition fee expenditure is directly taken from the balance of payments of higher education institutions. Instead, non-tuition fee expenditure per international student is an approximate measure imputed by the host country's statistical authority based on the consumption behaviour of the average international student. Therefore, it might be a less accurate than tuition fee expenditure.

Figure 5.4 Changes in direct revenues from international students (%), 2019-2020

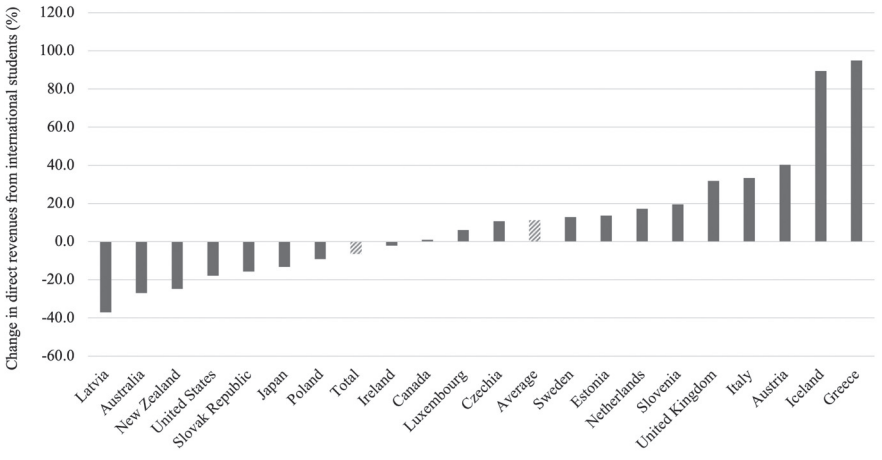


Source: author's elaboration from the data (OECD, 2024b).

The changes in the direct revenues from international students in OECD countries from before the Covid-19 pandemic up to 2022 reveal significant shifts in economic dynamics within the higher education sector.[23] Analysing the changes from 2019, the last year not impacted by Covid-19, to 2020 (Figure 5.4 above), several countries suffered considerable drops in revenues, with Greece experiencing the most significant decrease of 80.5%, followed by Slovenia at 71.1%, and Iceland at 67.5%. These declines led to an average decrease of 23.1% in direct revenues across OECD countries. Major recipient countries like Australia, New Zealand, and the United States also experienced significant declines. Interestingly, despite enrolments not significantly dropping in most countries, direct revenues had already decreased in 2020. This was because tuition fee payments were halted or halved in several countries, and private expenditure largely dropped due to lockdown restrictions. It is likely that indirect contributions, not quantifiable through an export approach, also significantly decreased to different extents in different countries.

23 Data on the exports on education-related services, which in an export approach measure direct revenues from international students, are available until 2022. Unfortunately, as discussed in the main text, enrolments data are available until 2021 and, therefore, it is not possible to compare enrolments and revenues in 2022. Data on the enrolments of international students in 2022 will become available with the OECD's publication of *Education at a Glance 2024* by the end of 2024.

Figure 5.5 Changes in direct revenues from international students (%), 2020-2021

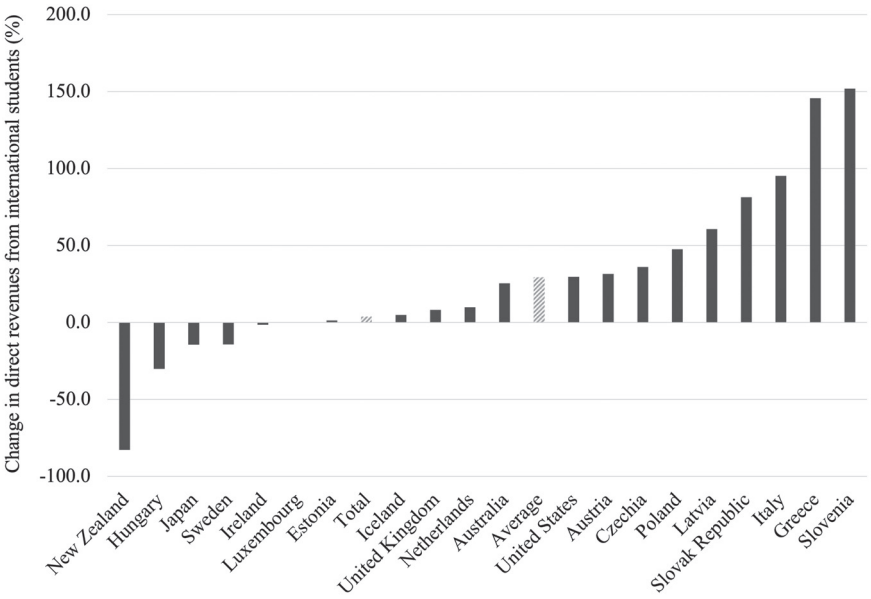


Source: author's elaboration from the data (OECD, 2024b).

In 2020-2021 (Figure 5.5 above), downward trends in revenues persisted, although less severe compared to the previous year. Latvia, Australia, and New Zealand experienced substantial declines. However, some countries showed strong resilience. For instance, Estonia, the Netherlands, and the United Kingdom showed positive growth in direct revenues from international students. These are some of the same countries where enrolments of international students grew as well in 2021. The average change in this period was an 11.2% increase, indicating a partial overall recovery, but with significant country heterogeneity.

In 2021-2022 (Figure 5.6 below), the data show a mixed picture of recovery and persisting declines. New Zealand faced a further staggering decline of 82.8%, signalling persisting difficulties in attracting international students even at a later stage of the pandemic. However, several countries, including Austria, Czechia, and Italy, demonstrated remarkable growth. For the reasons discussed above, like geographical proximity and relative easiness of travel in the EU during the pandemic, European countries often appear among those where revenues increased most, or decreased the least, during the pandemic.

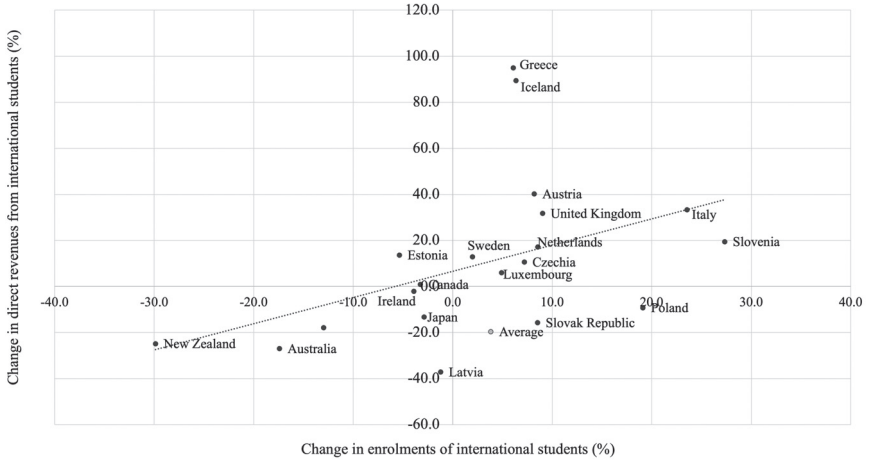
Figure 5.6 Changes in direct revenues from international students (%), 2021-2022



Source: author's elaboration from the data (OECD, 2024b).

The trends in direct revenues from international students were largely driven by fluctuations in the number of enrolments already discussed. Figure 5.7 below shows that, from 2020 to 2021, the last year for which both enrolment and revenues data are available, countries experiencing significant declines in enrolment numbers also witnessed drops in direct revenues, highlighting the interconnectedness of these factors. Conversely, countries showing resilience or growth in enrolment figures often saw stable or increasing direct revenues. The correlation between the two metrics (0.43) underscores the importance of enrolment stability for the economic sustainability of the international higher education sector. However, the direct relationship between enrolments and revenues experiences different shifts from country to country because of the varying country-specific changes in the revenues' components. First, during the pandemic tuition fees remained fixed in some countries, while they were reduced or suspended in others. Second, private expenditure by international students (and their guests) was limited by the lockdown measures imposed with varying degrees of strictness in all OECD countries.

Figure 5.7 Changes in enrolments and revenues of international students (%), 2019-2021

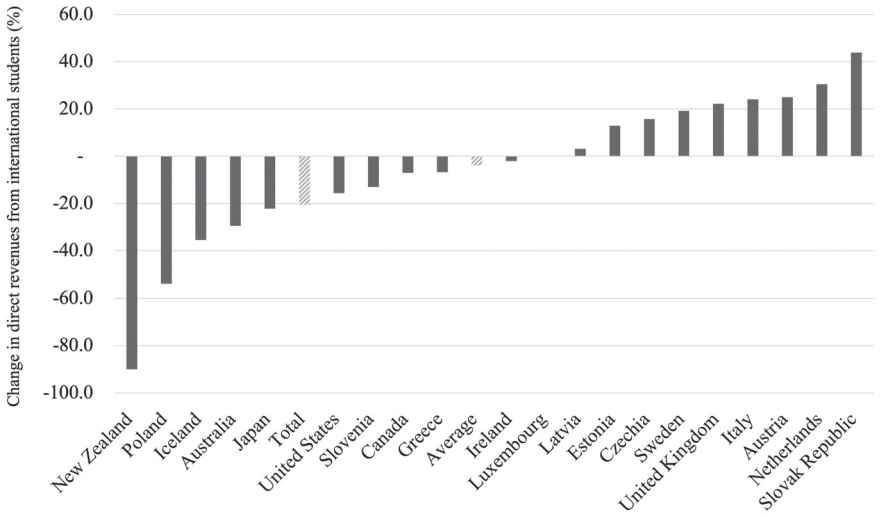


Source: author's elaboration from the data (OECD, 2023, 2024b).

In sum, the data on enrolments and revenues reflect the complex and dynamic nature of international higher education in OECD countries amid the Covid-19 pandemic. While international enrolments decreased in some countries and increased in others, the total change in direct revenues from international students in the OECD from 2019 to 2022 is a decrease of 20.6% (Figure 5.8 below). As challenges have persisted until 2022 and total enrolments and revenues in the OECD have not caught up with pre-pandemic numbers yet, some countries, especially in Europe, experienced increases both in terms of enrolments and direct revenues from 2019 to 2022.

At this moment, the data do not allow to predict when total enrolment and revenues will match the record levels achieved before the pandemic. Given that the total decrease in revenues has been considerably higher than the decrease in enrolments, mostly due to the severe drops in Australia and New Zealand, it is likely that revenues will return to pre-pandemic levels after enrolments recover. It also remains to be seen whether the increase in international students in Europe during the pandemic was only temporary or if it will persist in the long run. If persistent, this would represent an important shift in international higher education trends, potentially limiting the predominant position of English-speaking countries outside of Europe.

Figure 5.8 Overall changes in direct revenues from international students (%), 2019-2022



Source: author's elaboration from the data (OECD, 2024b).

5.5 Conclusion

The economic impact of international students in OECD countries is a complex phenomenon with far-reaching implications for both the sending and receiving countries. As evidenced by the extensive literature review presented in this study, the contributions of international students to the economy of the host country expand beyond direct income gains via tuition fee and non-tuition private expenditure to encompass a wide array of indirect effects. From stimulating demand in various sectors to fostering technological innovation and regional growth, international students play a significant role in shaping the economy of their host country.

The three main methods employed in the literature to calculate the income received from international students by the host country are the exports approach, the input-output approach, and the general equilibrium approach (GE). Each of these methods offers valuable insights into different aspects of the phenomenon. While the exports analysis provides accounting figures exclusively for the direct revenues from international students during their studies, input-output and GE models are designed to include indirect and long-term effects as well, albeit with important limitations. Generally, most studies on the subject are country-specific and provide little comparative evidence. From the findings in the literature, it appears that the countries receiving the highest direct revenues from international students during their studies are the English-speaking ones that have been in the market the longest: the United States, Australia, and the United Kingdom.

This study considers the economic impact of international students also beyond the immediate income gains and looks at the effects on local and national labour markets, technological innovation, and regional and national growth in the longer run. These effects are the strongest for local businesses and industries, university cities, and the surrounding areas. However, most of the models employed until 2020 for the calculations of the long-run economic effects have been based on pre-Covid-19 factors and might need to be updated. As the possibilities for remote studying and remote working considerably increased during and after the pandemic and the most recent trends show European countries gaining a higher share of international students, it remains to be seen whether the models built before the pandemic are still accurate.

The Covid-19 pandemic introduced unexpected challenges to international education, with different consequences depending on each country's location and policies. While some countries, mostly the ones most difficult to reach during the pandemic, experienced significant declines in enrolments, others, mostly the European countries, saw remarkable increases. This underscores the complex interplay of variables influencing the students' decision to move or not to move during times of crisis. Through the application of an export analysis based on the most recent OECD data, the findings of this study reveal significant declines in direct revenues from international students in most countries, particularly in 2020 and 2021, followed by a mixed picture of struggles and recovery in 2022. Countries experiencing declining enrolments also witnessed drops in direct revenues. Conversely, countries that demonstrated resilience or growth in enrolments often saw stable or increasing direct revenues. The relationship between enrolments and revenues was influenced by country-specific factors like the Covid-19 national and international restrictions, institutional policies on the modes of instruction, and the adaptability of universities to the pandemic.

Looking ahead, the literature has several open venues for future research. First, large comparative studies on the economic effects are still limited. Despite the adoption of an export approach allowing for comparisons across countries of the direct economic impact of international students during studies, the available cross-country evidence is scarce. Comparative studies inform countries of best practices in the industry and can provide important advice on the directions to follow. It remains to be seen whether it would be possible to adopt methodologies that estimate indirect effects across countries and over time without making country-and-time-specific assumptions. Second, most studies tend to ignore the costs associated with the intake of international students and focus only on the immediate benefits. Including a calculation of the costs can orient the debate and policy decisions based on facts, ensuring a more balanced and informed evaluation. Finally, precise estimates of the post-study impact are even rarer due to the difficulties in tracking international students post-graduation and in quantifying their long-term economic contributions. The increasing quan-

tity of higher education data becoming available over time will allow such studies to grow in both the quantity and quality of the analyses.

It is important for policymakers and stakeholders in higher education to adapt to the evolving landscape of international education, taking into account the lessons learned from the pandemic and the decade of sizeable growth that preceded it. Policymakers should also ensure that the economic analysis includes both benefits and costs to inform balanced and effective policy decisions. An evidence-based approach can help in devising strategies that not only attract international students but also heighten their positive impact on the host country's economy and society. There is increasing evidence that international students are one of the potential drivers of employment, technological innovation, and economic development in the receiving countries. By creating an inclusive and supportive environment and updating their attraction and retention policies to a post-pandemic world, countries can maximise the benefits of global talent mobility, while tackling the challenges of globalisation.

5.A Additional Tables

Table 5.2 Recent studies on the economic impact of international students in OECD countries

Country	*Approach and data*	*Estimated economic benefits*	*Years*	*Author*
Australia*	The approach adopted was exports-based. To model the economic contribution from student expenditure on fees and living expenses, different lines of revenues were considered. Enrolment data were based on 2014 figures, while revenue and consequent contribution to value added and employment were based on income year 2014-2015 figures.	International education was estimated to contribute AUD 17.1 billion to Australia's GDP in 2014-2015. The export revenues were estimated to support over 130,700 Full Time Equivalent (FTE) employees in 2014-2015, accounting for 1.3% of Australia's total employment.	Academic year 2014-2015	Deloitte Access Economics, 2015
Austria	Based on an analysis of the literature, an input-output model was developed to quantify the income contribution of international students. The data were from a survey administered by Prognos AG and from the statistical offices of the country considered.	The value added calculated for international students amounted to around €8,000 per individual. Every 10 international students, 1.5 jobs were estimated to be added to the Austrian economy (8,800 in aggregate). The aggregate value added by each graduate amounted to around €74,000.	2011	Prognos, 2013
Belgium (Flanders)	The methodology used a cost-benefit analysis, by which the direct and indirect benefits and costs of international students were calculated. The long-term impact of international students was examined by estimating the stay rate after graduation and the subsequent contribution to the national economy. Data on students were taken from the Flemish Ministry of Education and stay rates data were taken from the Flemish Government Social Security Data.	Regarding direct contribution: the private social contribution made by students (e.g., due to student jobs) is close to €48 million, tuition fee income is close to €57 million, while the non-tuition fee income from spending amounts to nearly €630 million. Furthermore, long-term benefits are estimated to be a variable amount between €4.2 and €5.6 billion.	Academic year 2015-2016	De Witte and Soncin, 2021
Canada	An input-output model was built upon extensive secondary research involving reviewing literature, collecting existing statistical data and information, as well as consulting with representatives from the provincial and territorial education sectors, and representatives from organizations researching trends in international education in Canada and its provinces.	The combined direct and indirect contribution of all international student expenditures amounted to CAD 19.7 billion. In terms of employment, 218,577 jobs.	2018	Global Affairs Canada, 2020

Country	*Approach and data*	*Estimated economic benefits*	*Years*	*Author*
Denmark	A cost-benefit analysis was carried out by the Danish Ministry of Education from national registry data. The average net contribution per international student is calculated on the basis of students from the period 2004-2015 with a focus on the year groups that started in the period 2004-2007. This follows the behaviour of the international students for up to 11 years after the start of their studies.	Approximately one in four international students in a bachelor programme was estimated to make a positive net contribution to public finances. In the master's programmes, a little more than one in three was estimated to make a positive net contribution. Overall, including those who left Denmark immediately after graduating, each student contributed on average between DKK 2,000-7,500 per year from the start of studies.	2004 to 2016	Danish Ministry of Higher Education and Science, 2018
Estonia	An export analysis was performed on population census data collected by Statistics Estonia.	International students paid €3.6 million in income tax and €7.8 million in social contributions, which is an increase of more than €1 million year on year. The total tax receipts from international students who graduated in the academic year 2019-2020 and continued working in Estonia was €4.5 million.	Academic year 2019-2020	Statistics Estonia, 2022
Finland	The data are from the national statistical office, Statistics Finland. The analysis starts from an export approach and then the input-output model is built.	International students contributed €81 million to the Finnish economy. The calculation took into account the resources used for education, the net annual tuition fees received, the indirect income transfer effects resulting from the students' consumption and work, and the income earned by foreigners who graduated in the period from 2009 to 2019.	Academic year 2019-2020	Suhonen et al., 2022
France	An export approach was built on survey data. Between February and April 2022, a 50-question survey was distributed to 9,992 international students who had stayed in France in the last three years. This sample was made representative of the 302,863 international students in France via statistical adjustment, applied on four determining criteria: student's geographic origin, type of higher education institution attended, level of study, and receipt of French government scholarships.	International students contributed around €5 billion to the French Economy. The net contribution was €1.3 billion, after subtracting the imputed costs.	2022	Campus France, 2022

Country	*Approach and data*	*Estimated economic benefits*	*Years*	*Author*
Germany	Based on an analysis of the literature, an input-output model was developed to quantify the income contribution of international students. The data were from a survey administered by Prognos AG and from the statistical offices of the country considered.	International students generated €400 million in tax revenues and created 22,000 jobs. Since education in Germany is predominantly public and tuition-free, the state shoulders considerable costs, but these expenditures were estimated to amortise if 30% of international graduates stayed and worked in Germany for at least five years.	2011	Prognos, 2013
Hungary	Mixed methodology, using qualitative analysis primarily for expert interviews and focus group studies, and quantitative methods for questionnaire surveys. Regarding data sources, secondary data have also been used; data were provided by the Central Statistical Office, the National Tax and Customs Administration of Hungary, the National Spatial Development and Management Information System, as well as the Higher Education Information System.	Overall, the direct economic contribution by the students and their guests was HUF 180 billion through fees, living expenses, and tourism. Through their spending, students have an average employment effect of 8.3 workers added per 100 students. Considering the indirect effects and the intersectoral relations, the employment effect is close to 20,000 added jobs. Besides, students' spending also generated public revenues for over HUF 10 billion.	Academic year 2019-2020	Tempus Public Foundation, 2020
Ireland	The approach used was exports-based. University fees' contribution to the economy estimations were carried out with export data from the Irish University Authority, while non-tuition fee expenses come from the Higher Education Authority's student survey.	Net contribution of international students from tuition fees was around €216 million. The estimated total non-tuition expenditure by international students was €119.5 million. The total annual export income generated for the Irish economy by international students was around €336 million.	Academic year 2017-2018	Indecon International Economic Consultants, 2019
Latvia	The approach used was an input-output model built on survey data. 848 students were surveyed from a potential pool of 4,376, 80% of all those studying in Latvia in the 2015-2016 academic year. For the analysis of the indirect effects, OECD multipliers have been used.	International students directly contributed around €73 million to the Latvian economy. The indirect contribution was estimated around €75 million. The total impact of international students on the Latvian economy was estimated to be around €148 million (0.6% of GDP). Also, they contributed about €20 million a year to the Latvian budget in taxes and created about 1,474 jobs (2.7 for every 10 students).	Academic year 2015-2016	Domnïca Certus, 2016

Country	*Approach and data*	*Estimated economic benefits*	*Years*	*Author*
The Netherlands	Microdata from the Dutch Central Bureau of Statistics were used to calculate the chances of staying and the labour market outcomes. The use of microdata for these calculations made it possible to distinguish between different groups of students. For the calculation of costs and benefits, a distinction was made according to type of education and origin (EEA or non-EEA).	Over the lifecycle, international students from the academic year 2021-2022 will generate a net contribution of €1.5 billion. The balance of income and costs during and after the study is positive for both EEA and non-EEA students, but the balance is much larger for students from non-EEA countries.	Academic year 2021-2022	Elfferich, 2022
New Zealand*	The economic contribution associated with students' spending was estimated using a multi-regional input-output model. The assessment was delivered using a staged approach with a survey to collect information, an information review stage, and the modelling stage. The National Research Bureau coordinated the survey stage. Immigration New Zealand drew the samples and contacted the selected students.	International students delivered an economic contribution of NZD 5.1 billion to the New Zealand economy (4.8 on-shore and 0.3 off-shore) and supported an estimated 47,490 jobs. Visiting guests added an additional NZD 460 million to the economy.	2017	Market Economics Limited, 2018
Poland	Based on an analysis of the literature, an input-output model was developed to quantify the economic contribution of international students. The data come from a survey administered by Prognos AG and from the statistical offices of the country concerned.	The gross value added per student amounted to €3,900. Every 10 international students add 2.3 jobs to the economy (5,700 in aggregate). The aggregate gross value-added effect per head was €22,100. The long-term tax revenues from indirect taxes on consumer goods and services as well as direct taxes on the earnings arising from job creation were around €1,200.	2011	Prognos, 2013
Spain	The estimation technique was based on an input-output model. The data were gathered from various public and private educational institutions.	International students made an overall economic contribution to the Spanish economy of €3.7 billion (with an estimated multiplier effect of almost 2.3).	Academic year 2018-2019	Grasset and Menéndez, 2020
Sweden	For the calculations, an input-output model built on Swedish Higher Education Authority's data was employed. Student subsistence spending has been calculated using the cost of living in Sweden, produced by Study in Sweden, an organisation promoting Sweden as a higher education destination.	International students' expenditure amounted to an estimated SEK 2.4 billion supporting around 2,900 jobs. The economic activity and employment sustained by international students' subsistence spending also generated SEK 660 million in tax revenues for the Swedish national and municipal government.	Academic year 2017-2018	Oxford Economics, 2020

Country	*Approach and data*	*Estimated economic benefits*	*Years*	*Author*
Switzerland	Based on an analysis of the literature, an input-output model was developed to quantify the income contribution of international students. The data were from a survey administered by Prognos AG and from the statistical offices of the country considered.	The gross value added per student amounted to €17,500. Every 10 international students, 1.8 jobs were estimated to be added to the economy (4,100 in aggregate). The aggregate gross value-added effect per student was around €24,400.	2011	Prognos, 2013
United Kingdom	The approach adopted was an input-output model. The analysis focused on the aggregate economic benefits and costs to the UK economy associated with the 381,356 international students commencing their studies in 2021-2022, taking account of the total impacts associated with students over the entire duration of their study in the United Kingdom (adjusted for completion rates).	The 2021-2022 cohort of international students delivered a net economic benefit of approximately GBP 41.9 billion, of which GBP 4.3 billion from EU students, and GBP 37.6 billion from non-EU students.	Academic year 2021-2022	London Economics, 2023
United States	The approach adopted was exports-based. Student enrolment data were provided by the *Open Doors* report published by the Institute of International Education in partnership with the Bureau of Educational and Cultural Affairs, US Department of State. Tuition and living expense data come from the US Department of Education's National Center of Educational Statistics Integrated Postsecondary Education Data System. Datasets used to calculate the number of jobs created or supported came from the US Department of Commerce, specifically International Trade Administration and Bureau of Economic Analysis.	International students contributed $33.8 billion to the United States economy. International students also created or supported over 335,423 jobs. For every three international students, one US job was created and supported by private expenditure in the higher education, accommodation, dining, retail, and transportation sectors.	Academic year 2021-2022	Nafsa, 2023

Notes: *Australia and New Zealand produced reports also during the Covid-19 pandemic years. However, these reports do not correctly represent the pre-pandemic state of international higher education in these countries because, as discussed in the main text, they were the two countries hardest hit by drops in international enrolments and revenues. For this reason, I prefer to include older studies that are more representative of the period before Covid-19. *Source*: author's elaboration from the literature.