Baseline Valuation

Broader benefits of international education for New Zealanders

Valuation Report

November 2022
FINAL

Building a better working world

Ernst & Young
PO Box 490
Wellington 6140, New Zealand

Tel: +64 9 377 4790
Fax: +64 9 309 8137
http://www.ey.com/nz

Building a better working world

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1. Summary

1.1 Overview

EY was commissioned by Education New Zealand (ENZ) to design and build a Valuation for New Zealand's international education sector. This Valuation measures the economic, social (including educational and cultural), and international benefits of international education for New Zealand – it provides information to support the rebuilding of a diverse, resilient, and sustainable international education sector.

The New Zealand International Education Strategy[1] seeks to build a thriving and globally connected New Zealand through world-class international education sector. The Valuation provides mechanism for demonstrating progress towards achieving the Strategy and ENZ's Strategic Framework. It will guide ENZ's strategic and operational activities and on how to best achieve the greatest impacts for New Zealand.

1.1.1 Main findings

International learners make up a small proportion of our learners. **There is evidence that international learners contribute significant economic and social benefits for New Zealand in the immediate-term. In 2019 this included over $3.7bn in contributions to our economy and helping to create around 6,000 in flow-on employment FTE[2].** These benefits have reduced significantly by $2.9bn to $0.8bn in 2022 due to the pandemic.

The large majority of learners return to their country of origin once they have completed study. There is evidence that international learners who remain continue to contribute significant economic, social and international benefits for New Zealand in the longer-term. In 2019 this included up to $5.9bn in contributions to our economy and around 73,000 in employment FTE. These impacts are projected to reduce significantly by 2030 (contributions up to $3.6-$5.1bn) as a result of minimal international student intake during border closures.

International education's immediate-term contribution to GDP output is unlikely to return to pre-pandemic levels until 2030 without significant investment in a sustainable and resilient sector. By 2030, a 'conservative' recovery would contribute $3.8bn (increase of $0.1bn from 2019) while a 'neutral' or 'optimistic' recovery would contribute $4.2bn (increase of $0.5bn from 2019).

More broadly, there is evidence that international education can enable domestic students to develop **global competence** within a structured teaching environment, and contributes to **soft power in diplomacy, trade and perceptions of New Zealand** through a range of mechanisms, although these impacts were not directly quantifiable. **Broader impacts for Māori** are potentially also present across each area of impact from international education.

Post-study learners have contributed to **increased population demand for housing, infrastructure and services** over the last few decades alongside a broad range of other demand drivers. It is likely that the positive economic impacts of post-study learners currently outweigh these negative effects over the long term, although it is acknowledged this is a contested area with no definitive perspective[3]. The extent to which longer-term impacts can be attributed to international education is also open to interpretation.

[1] New Zealand Government (2018), International Education Strategy 2018-2030.

[2] The previous valuations used a different methodology and generated different results. These differences are discussed in detail in section 2.2.

[3] New Zealand Productivity Commission (2021), Immigration – Fit for the future: Preliminary findings and recommendations

1.1.2 Immediate and longer-term benefits realised

The immediate-term economic impacts of fees, expenditure, visiting family and friends tourism spend and education-related exports are projected to be around $790m in GDP output in 2022. This is considerably lower than the previous valuation, reflecting the adverse impacts of COVID-19 border restrictions on enrolments as well as the shift to a CGE modelling approach[4]. This impact is projected to gradually recover in line with student enrolments with a return to pre-pandemic levels by 2030 ($3,780m to $4,200m in 2030).

The longer-term economic impacts from international learners who left study over the last 10 years and remain in New Zealand are projected to represent up to 73,000 in FTE employment and up to $6,090m in GDP output over the 2022 year. These estimates reflect the historical value that international education has contributed to the New Zealand labour market, as well as indicating the value these cohorts will generate in future.

The accumulated effect of 3-6 years of minimal international student intake on future contributions to labour supply, skilled human capital and education-based research and development is estimated to lead to a GDP output decrease of around $1,100m to $2,690m.

Table 1: Variance in immediate and longer-term benefits realised in 2019 compared with 2022 and 2030

GDP output over year ($m)	2019	2022	2030	Variance from 2019 to 2030[5]	Variance during pandemic period (2019 to 2022)
Benefits realised in the immediate-term	3,700	790	3,780 to 4,200	80 to 500	-2,910
Benefits realised in the longer-term*	Up to 5,870	Up to 6,090	Up to 3,610 to 5,070	-1,100 to -2,690	220

** Note: Variation from 2019-30 includes the impact of reduced education-based R&D and human capital. Baseline values for GDP output from all education-based R&D and human capital were not available.*

1.1.3 Recovery scenarios

The valuation of international education impacts for New Zealand over the next 10 years has been significantly affected by border closures and other effects arising from the pandemic. Given this uncertainty, three post COVID-19 recovery scenarios were applied to the CGE modelling of immediate and longer-term economic impacts with different timing and volume assumptions for international students returning to onshore study. These scenarios were provided by ENZ as at January 2022.

Under a 'conservative' scenario with a slow recovery in onshore enrolments, **immediate-term economic impacts only recover to pre-pandemic levels in 2030 and labour supply yearly impacts decrease to 62% of pre-pandemic levels by 2030. An 'optimistic' recovery** with fewer constraints and a faster recovery in onshore enrolments **sees immediate-term economic impacts return to pre-pandemic levels in 2028 and labour supply yearly impacts start to recover from 2030 onwards.**

[4] CGE stands for Computable General Equilibrium, and this is in contrast to the previous Input/Output (I/O) methodology.

[5] The timeframe over which variations are expected to impact GDP output depends on the impact type. For labour supply and productivity, variations in 2030 are expected to be realised in that same year. For education-based R&D and human capital, variations in 2030 are expected to be realised over a longer term period (e.g. 2030-40).

The larger economic regions with universities are expected to recover faster than other regions which are smaller or have a greater reliance on other education subsectors.

Table 2: Variance in immediate and longer-term benefits realised in 2022 compared with a 'conservative' recovery by 2030

GDP output over year ($m)	2022	2030	Variance from 2022 to 2030[5]
Benefits realised in the immediate-term			
Conservative recovery	750	3,780	3,040
Neutral recovery	790	4,150	3,360
Optimistic recovery	840	4,200	3,360
Benefits realised in the longer-term *			
Conservative recovery	Up to 6,090	Up to 3,610	-2,900
Neutral recovery	Up to 6,090	Up to 4,450	-1,990
Optimistic recovery	Up to 6,090	Up to 5,070	-1,320

** Note: Variation from 2022-30 includes the impact of reduced education-based R&D and human capital. Baseline values for GDP output from all education-based R&D and human capital were not available.*

1.1.4 Considerations outside the Valuation scope

This Valuation does not attempt to quantify future labour market profiles, changes to future immigration system or other government policy settings. Shifts in these policies and settings may materially affect the economic impact estimates.

This Valuation does not include analysis of the full delivery costs of education. This would require education provider data on cost allocations by domestic and international student groups which is not currently available from the sector.

Note as at August 2022: *The model findings set out in this report are based on a number of assumptions informed by pre-pandemic experience and ENZ's internal forecasts around future student enrolments as at January 2022. Since then, material events have occurred which affect these assumptions, forecasts and therefore the projected economic impacts. These events include changes to post-study visa settings and border re-opening dates. These impacts are not reflected in this report.*

1.2 A guide to this report

The remainder of this report is structured as follows:

Section 2 *describes the valuation framework, approach taken to value the economic, social and cultural, and international impacts. This section also highlights where the approach differs from previous valuations.*

Sections 3, 4 and 5 *provide the estimated value of the broader impacts of International Education to New Zealand, both in the short and long-term under varying scenarios for future onshore student numbers post COVID-19.*

Sections 6 and 7 *set out the current modelling and data limitations and describes the opportunities for future improvements, including the next steps needed to achieve this.*

A detailed overview of the methodology adopted for the valuation is set out in the appendices.

2. Introduction

2.1 Background

2.1.1 Purpose of the Valuation

EY was commissioned by Education New Zealand (ENZ) to design and build a Valuation for New Zealand's international education sector. This Valuation measures the economic, social (including educational and cultural), and international benefits of international education for New Zealand – it provides information to support the rebuilding of a diverse, resilient, and sustainable international education sector.

The New Zealand International Education Strategy[6] seeks to build a thriving and globally connected New Zealand through a world-class international education sector. The Valuation provides a mechanism for demonstrating progress towards achieving the Strategy and ENZ's Strategic Framework. It will guide ENZ's strategic and operational activities on how to best achieve the greatest impacts for New Zealand from international education.

2.1.2 Components of the Valuation

Previous assessments were fit for purpose in a time before the need for transformation. This Valuation's broader approach builds on the previous biennial economic assessments undertaken by various external providers. These assessments have demonstrated a historic economic contribution of approximately $5.1 billion annually generated through international education delivered in New Zealand and in other countries.[7]

This Valuation also reflects the findings of a recently completed review of the previous methodology. The review of economic valuations of the international education sector was commissioned by the International Education Chief Executives group[8], and highlighted several opportunities for improvements to future valuations, including expanding the scope to include broader economic and social impacts.

Since those estimates were prepared, the international education sector has been significantly and adversely impacted by border closures and travel restrictions worldwide. The current global environment and the government's recovery plan for international education provide an opportunity and platform for exploring a future focused approach to the Valuation of the economic, social, and international impacts for New Zealand.

The core components of this Valuation include:

- Measurement of the core or net[9] economic impact for New Zealand
- Measurement of broader economic, social and international impacts for New Zealand
- Segmentation by a broad range of activities delivered on and offshore
- Segmentation by a broad range of educational products and services

[6] New Zealand Government (2018), International Education Strategy 2018-2030.

[7] International education delivered in New Zealand contributed $4.8 billion to the New Zealand economy (M.E. Consulting (2018), Economic Valuation of International Education in New Zealand). International education delivered in other countries contributed between $250 and $300 million (PwC (2018), The Value of New Zealand's Educational Exports 2018).

[8] Strategas Consulting (2021), Review of Economic Valuations of New Zealand's International Education Sector. Report for MBIE on behalf of International Education Chief Executives Group

[9] As much as feasible, net economic impacts should reflect costs and any adverse demand impacts

- Segmentation by a broad range of delivery markets and industry providers
- Establishment of an evidence base for measuring performance and guiding decisions

The model design requirements included:

- Responding to the findings of the completed review of previous methodology
- Considering the use of various qualitative and quantitative data sources
- Considering various modelling techniques and methodologies
- Considering data privacy, collection, storage, and application
- Assessing different confidence levels of impact measurement
- Assessing the benefits and feasibility of various design options

Considerations outside the scope of the Valuation included:

- Impact of changes to future government policy and settings, including in-study work rights, immigration, education sector (e.g. from the reform of vocational education) and tourism
- Analysis of full delivery costs of education

2.1.3 Timeframes and deliverables

The design and build of a Broader Impact Valuation (Valuation) for New Zealand's international education sector was scheduled for completion in early 2022. A design and methodology report was developed in September 2022 which informed the build of the Valuation modelling. An initial insights report based on early modelling outputs was provided by December 2021 ahead of the completion of economic modelling in February 2022 and this full baseline valuation report in April 2022.

This report was updated in August 2022 to highlight material events that have occurred since completion which are likely to affect estimated economic impacts, including (but not limited to) changes to immigration system settings and border re-opening dates. Modelling outputs reflect assumptions and inputs as at February 2022 and have not been updated.

2.2 Principles for development

2.2.1 Improvements in modelling methodology

Previous valuations used Input/Output (I/O) modelling approaches to value the core economic impact from international education. This valuation uses a Computable General Equilibrium (CGE) modelling approach to estimate the value of the following economic impacts:

- Student fees, expenditure and tourism spend from visiting family and friends
- Education and training exports
- Labour supply and productivity

This approach is consistent with the review of economic valuations of the international education sector commissioned by the International Education Chief Executives group[10], which noted significant shortcomings in an input/output (I/O) approach, including a failure to account for labour supply constraints, price levels, and productivity settings. The CGE approach (and the models that calibrate the economic inputs to the CGE model) allow for a more dynamic and granular segmentation of outputs and incorporate model constraints that more closely reflect real-life economic parameters, expanding the evidence base available to support strategic and operational decision-making.

This approach produces a valuation estimate that is around 69% of the value produced by the I/O approach under the previous valuation. This is at the upper end of the range of differences observed by international studies which compare I/O and CGE modelling methodologies; the review of the previous valuation observed that differences showed considerable variation and ranged from 20% to 64%.

Further detail on the CGE modelling approach can be found in Appendix B and the design and methodology report.

2.2.2 Recognition of broader impacts

This valuation considers broader economic, social, cultural and international impacts and aims to provide an understanding of both immediate and longer-term impacts from international education across the whole system. Previous valuations have focused on the short-term core economic impacts over a given year.

As mentioned above, economic impacts from increased labour supply and productivity are valued using a CGE model. Longer term economic impacts from education-based research and development and human capital are valued using quantitative analysis. The remaining economic, social, cultural and international impacts are assessed using qualitative analysis, with subjective assessment of the scale of their overall impact on New Zealand where the limited data available supports this.

This analysis has been developed within a cost-benefit framework, considering both direct and indirect positive and negative impacts from the sector on a net basis. This was a recommendation from the review of valuations of the international education sector commissioned by the International Education Chief Executives group.

Further detail on quantitative analysis approaches for longer-term economic impacts can be found in Appendix C.

[10] Strategas Consulting (2021), Review of Economic Valuations of New Zealand's International Education Sector. Report for MBIE on behalf of International Education Chief Executives Group

2.2.3 Immediate and longer-term impact horizon

This valuation considers impacts that emerge over a range of short to longer-term time horizons:

- **'Immediate-term' impacts** are derived from in-study international learners in the same enrolment year or a similarly short timeframe, with an example being the effects of tuition fees and expenditure on economic output over a given year.

- **'Longer term' impacts** refer to those that emerge from international learners post-study (for example, labour supply impacts from those who transition into employment in New Zealand) or where there is a lag between the contribution of international learners and impacts being potentially realised (e.g. productivity gains from education-based research).

Under the new modelling methodology, the CGE model is used to estimate annual economic impacts over a multi-year projection period (2019-2030) with longer term impacts assessed using quantitative or qualitative approaches. Previous valuations focused on the short-term core economic impacts over a given year.

2.2.4 COVID-19 related border closures and recovery scenarios

In the time since the previous valuation, New Zealand's international education sector has been significantly and adversely impacted by COVID-19 associated border closures, visa settings and travel restrictions worldwide. This has materially influenced the valuation of the impacts from international education for New Zealand over the next 10 years. There is now significant uncertainty around future student enrolments along with other assumptions underpinning this valuation.

Given this uncertainty, three post COVID-19 recovery scenarios have been applied to the CGE modelling of immediate and longer-term economic impacts, based on different assumptions around the timing and volume of international students returning to onshore study in New Zealand available at the time of undertaking this analysis (January 2022). Further details can be found in Appendix B.

Throughout the report, these scenarios are referenced against a 'No COVID-19' scenario which assumes student numbers continue to increase over the projection period in line with an average growth rate, calculated using data across previous years.

Future education export earnings are likely to move in a different pattern from the impacts associated with onshore international education. The pandemic has led to a significant uptake of alternative education delivery models, such as remote delivery of teaching services supported by technology and online solutions (sometimes referred to as EdTech), and increased acceptance of offshore and remote learning options which can be more accessible and affordable than onshore international education. It is likely that future education models will reflect some of these changes even with a return to in-person tuition. New Zealand's education exporters may experience both opportunities and challenges post pandemic. As such, alternative post COVID-19 scenarios were applied based on an illustrative +/-20% variation in export earnings from the 'No COVID-19' scenario.

Consideration for COVID-19's immediate and longer term effects on broader economic and social impacts has also been made where information is available to support this.

Note as at August 2022: *These scenarios reflect ENZ's internal forecasts at a point in time (January 2022). As at August 2022, material events have occurred which will have affected forecasts and projected economic impacts, including changes to post-study visa settings and border re-opening dates. These impacts are not reflected in this report.*

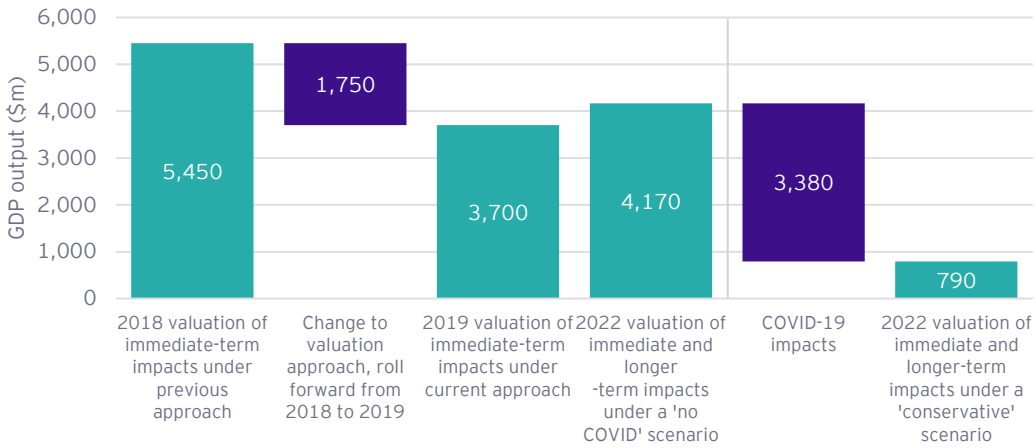
2.2.5 Overview of valuation movements from methodology improvements and inclusion of pandemic impacts

The graph below summarises the movements in international education's estimated GDP impact over 2018-19 that are attributable to the differences in valuation approach, and in the 2022 valuation as a result of COVID-19 related effects.

For the 2019 year the immediate-term economic value delivered from international education to New Zealand was estimated at around $3,700m. This compares to the $5,450m impact from the 2018 valuation. Longer term econonomic impacts from labour supply contributions were estimated to range up to $5,870m in 2019, acknowledging that there is uncertainty around the extent to which labour supply impacts are directly attributable to international education compared with other factors such as broader immigration policy.

For the 2022 year the immediate-term economic value that would have been delivered from international education to New Zealand had COVID-19 not occurred was estimated at around $4,170m. The effects of COVID-19 related border closures and other restrictions are estimated to have reduced this value to $790m in the 2022 year.

Figure 1: Summary of the differences in the valuation of immediate-term economic impacts over 2018-2019 attributable to methodology changes, and in the valuation of immediate-term economic impacts over 2022 attributable to COVID-19



The methodology change has also shifted the estimated flow-on (indirect) employment arising from immediate-term economic impacts. For the 2019 year flow-on employment from fees, expenditure and visiting family and friends tourism spend was estimated to be around 6,400 FTE. This compares to the 48,500 employee counts estimated by the 2018 valuation. The difference between the two estimates is largely due to the inclusion of labour supply and other economy-wide constraints within the CGE model which were not reflected in the previous I/O models, and should be interpreted as a restatement (rather than a decrease) of employment impacts.

2.3 Valuation framework

2.3.1 Strategic framework

The valuation framework used to capture the broader impact of New Zealand's international education sector considers economic, social and cultural, and international impacts realised in the immediate and longer-term.

This section sets out the conceptual framework used to describe the economic, social and cultural, and international impacts from international education for New Zealand. This framework was developed with reference to relevant literature from New Zealand and other jurisdictions.

Further detail is set out in the model design report.

Figure 2: Valuation framework and alignment with ENZ strategic framework

			Immediate-term	Longer-term
Broader impact valuation	**Economic impacts**	**Total economic impacts realised**	• Fees and expenditure • Visiting family and friends • Education and training exports • Cross subsidisation of teaching and research*	• Labour supply and productivity* • Education based research & development* • Human capital and tertiary education attainment*
	Social and cultural impacts	**Total social and cultural impacts realised**	• Outbound domestic students* • Housing and infrastructure impacts – learners studying onshore* • Broader impacts for Māori – immediate-term*	• Global competence and intercultural connections* • Housing and infrastructure impacts – post-study learners remaining in NZ* • Broader impacts for Māori – longer-term*
	International impacts	**Total international impacts realised**		• International research collaboration and mobility* • Bilateral trade relationships* • Soft power in diplomacy, trade and NZ brand*
	Total value	=	**Immediate-term value**	+ **Longer-term value**

** denotes broader impacts not included in previous valuations*

2.3.2 Economic impacts

This component describes the impacts of international education on immediate and longer-term economic activity. Identified impacts are summarised below.

In the immediate term, international education adds to the demand side of economic activity through fee revenue and expenditure associated with onshore students, visiting family and friends and education and training exports.

Over time, international students who transition into the domestic workforce can impact labour supply and productivity. Positive impacts can be considered where these students make a sustained and meaningful contribution to the quantity and productivity of the workforce over time; there can also be positive or negative flow-on effects from increased labour supply to wages for the domestic workforce.

International education also contributes to cross-subsidisation of teaching and research activities, which potentially benefits the skills profile of the domestic workforce, research initiatives, and the capability of the education sector. Longer term economic impacts described by the literature include enhanced bilateral trade relationships and contributions to research initiatives.

Table 3: Economic impacts realised in the immediate and longer-term

Impacts	Immediate term	Longer-term
Fees and expenditure	Yes	-
Visiting family and friends	Yes	-
Cross subsidisation of teaching and research	Yes	-
Education and training exports	Yes	
Labour supply and productivity *	-	Yes
Education based research and development *	-	Yes
Human capital *	-	Yes
Bilateral trade relationships *	-	Yes

** denotes broader impacts not included in previous valuations*

2.3.3 Social and cultural impacts

The impacts of international education extend beyond economic impacts to social and cultural elements of its potential contribution to New Zealand.

While it is important to note that many of the potential social impacts of international education may have flow-on economic effects, it is an increasingly difficult exercise to develop robust, defensible measures of these indirect market impacts, and so analysis in this report does not extend beyond direct impacts. Examples of the interaction between social and market impacts may include higher education improving lifetime health outcomes, with long term flow-on impacts on increased labour availability.

Table 4: Social impacts realised in the immediate and longer-term

Impacts	Immediate term	Longer-term
Outbound domestic students *	Yes	-
Broader impacts for Māori *	Yes	-
Social impact of learners while studying *	Yes	-
Global competence and intercultural connections *	-	Yes
Social impact of post study learners that remain in New Zealand *	-	Yes

** denotes broader impacts not included in previous valuations*

2.3.4 International impacts

International students develop a unique relationship with New Zealand and can potentially enhance New Zealand's international relationships and influence in the longer term. In addition to bilateral trade dynamics (captured under economic impacts), international education can contribute to increased 'soft power' in diplomatic relations and as a brand overseas which can positively impact demand for New Zealand products and cultural impact.

Table 5: International impacts realised in the immediate and longer-term

Impacts	Immediate term	Longer-term
Soft power in diplomacy, trade and New Zealand brand *		Yes

** denotes broader impacts not included in previous valuations*

3. Impacts realised in the immediate-term

International learners make up a small proportion of our learners. There is evidence that international learners contribute significant economic and social benefits for New Zealand in the immediate-term. In 2019 this included over $3.7bn in contributions to our economy and helping to create around 6,000 in flow-on employment FTE. These benefits have reduced significantly by $2.9bn to $0.8bn in 2022.

3.1 Summary

3.1.1 Number of learners

Prior to the pandemic, universities accounted for the largest proportion of international student enrolments (29% of onshore learners in 2019). English Language Schools had the second highest proportion of onshore international learners (20%), followed by Private Training Establishments (17%), Secondary Schools (15%) and Institutes of Technology and Polytechnics (14%).

Border closures saw a significant decrease in enrolments in all sectors, with a total decrease of onshore student numbers of 72% between 2019 and 2021. Universities retained the highest proportion of enrolments with a decrease in student counts of 57%, in part due to some existing students having longer course durations. Primary schools and English Language Schools experienced the loss of almost all enrolments.

Emerging data on onshore enrolments for January to March 2022 suggests that onshore student counts may end up being higher than anticipated under the 'optimistic' scenario, allowing for some students being onshore for a reduced portion of 2022 given the timing of visa approvals and border opening for visa-waiver countries. As a result the immediate-term impacts for 2022 may potentially be larger than what is described in this section.

Table 6: Variance in the annual number of learners, by subsector, enrolled in 2019 compared with projected 2022 enrolments

Education provider subsector	2019	2022 estimated*	Variance 2019 to 2022
Onshore			
Universities	33,828[11]	19,750	-42%
Institutes of Technology and Polytechnics (ITPs) and Wānanga	16,668	3,730	-78%
Private Training Establishments	19,460	6,700	-66%
Secondary Schools	18,352[12]	3,980	-78%
Primary / Intermediate Schools	5,225	680	-87%
English Language Schools	22,921	4,000	-83%
Sub Total – Onshore	**115,713[13]**	**38,840**	**-66%**
Offshore	1,472	7,550	
Grand Total	**117,185**	**Approx. 39,000 to 44,000**	**-63% to -67%**

[11] This includes 638 University exchange, PhD and NZ Aid students not included in MoE enrolment data

[12] This includes 682 school exchange students not included in MoE enrolment data

[13] Note: Students are counted in each subsector they enrol in, so the sum of the various subsectors (116,454) appears slightly higher than the total shown (115,713)

** Note: 2022 estimated enrolments are based on data around student enrolments over January to March 2022. It is expected that a number of offshore student enrolments over January to March 2022 will convert to onshore enrolment after the border re-opens.*

Most international learners are enrolled in the Auckland metropolitan region (56% in 2019), followed by Canterbury (12%), Wellington (8%) and Waikato (7%). Border closures saw a significant decrease in international learners across all regions, although those with universities had marginally smaller decreases due to some learners having longer course durations and remaining in New Zealand (Auckland, Wellington, Canterbury, Waikato and Manawatū-Whanganui).

Table 7: Variance in the annual number of learners, by region, enrolled in 2019 compared with projected 2022 enrolments

Region	2019	2022 estimated*	Variance 2019 to 2022
Onshore			
Auckland	63,092	22,770	-64%
Wellington	8,553	3,084	-64%
Canterbury	13,419	4,436	-67%
Waikato	7,558	2,690	-64%
Bay of Plenty	4,395	1,017	-77%
Otago	6,533	2,337	-64%
Manawatū-Whanganui	3,339	1,167	-65%
Taranaki	983	157	-84%
Hawke's Bay	1,275	302	-76%
Northland	688	171	-75%
Gisborne	35	8	-78%
Southland	1,019	264	-74%
Tasman-Nelson	1,717	406	-76%
Marlborough	113	24	-79%
West Coast	14	7	-49%
Sub Total - Onshore	**115,713**[14]	**38,840**	**-66%**
Offshore	1,472	7,550	
Grand Total	**117,185**	**Approx. 39,000 to 44,000**	**-63% to -67%**

** Note: 2022 estimated enrolments are based on the 'conservative' recovery scenario as this is the closest to emerging experience. It is assumed that the regional distribution per sector is the same as over 2017-2019.*

3.1.2 Total benefits realised in the immediate term

The economic impact of fees, expenditure and visiting family and friends tourism spend is projected to be around $550m in GDP output in 2022. This is considerably lower than the previous valuation, reflecting the adverse impacts of COVID-19 border restrictions on enrolments as well as the shift to a CGE modelling approach. This impact is projected to

[14] Note: Students are counted in each region they enrol in, so the sum of the various regions may not add to the total

gradually recover in line with student enrolments with a return to pre-pandemic levels by 2030 ($3,550m to $3,850m in 2030).

Education and training exports are estimated to be around $245m in GDP output in 2022, based on information from the 2018 exporter survey and future growth scenarios developed with ENZ. Unlike onshore student fees and expenditure, it is assumed that exports experienced minimal impacts from COVID-19 as they have less reliance on border movements.

Table 8: Variance in total benefits realised in the immediate-term in 2019 compared with 2022

Benefits realised in the immediate-term	2019	2022	Variance from 2019 to 2022
GDP output over year ($m)			
Fees and expenditure	3,180	510	-2,670
Visiting family and friends	300	45	-260
Education and training exports	220	240	25
Cross subsidisation of teaching and research (new)*	Not monetised		
Outbound domestic students (new)*	Not monetised		
Broader impacts for Māori (new)*	Not monetised		
Housing and infrastructure impacts of learners while studying (new)*	Not monetised		
Total GDP output over year	3,700	790	-2,910
Total indirect employment FTE	6,380	1,430	-4,950

3.1.3 Total costs incurred in the immediate term

The previous section presents the net monetised benefits from international education over the immediate-term. The following costs and deductions were included in the CGE modelling approach used to estimate the net benefits:

- **Earnings from international learners employed while studying.** These are deducted from total expenditure, as they represent amounts that were already circulating in the New Zealand economy prior to the arrival of international learners.
- **Commissions paid by education providers to overseas agents.** These amounts are deducted from total student fees as they leave the New Zealand economy with no subsequent impact on output.
- **Domestic students who undertake overseas exchange.** The expenditure of domestic students who undertake overseas exchange in each year is deducted from total expenditure, as this amount leaves New Zealand with no further impact on economic output.
- **Ministry of Education international student levies.** These are deducted from total international student fees.

Further detail on the assumptions underpinning each of these items is set out in Appendix B.

3.2 Economic impacts realised in the immediate-term

3.2.1 Fees and expenditure

Table 9: Variance of benefits from fees, expenditure in 2019 compared with 2022

	2019	2022	Variance
Gross Domestic Product ($m)	3,180	510	-2,670
Indirect employment[15] (FTE)	5,480	930	-4,550

International education generates fees from student enrolments with fee revenue flowing to education providers and then on to broader activity within the New Zealand economy. In addition to fees, students participate in the economy in other ways. Students spend money on goods and services, such as rent, living costs and activities, and earn money from employment in New Zealand while studying. Student spend contributes to economic activity across a range of sectors in New Zealand.

Table 9 summarises the estimated economic impact of student fees and other expenditure. Economic impacts under the 'conservative' post-COVID scenario have been presented for the 2022 projection results as this is the scenario closest to current Government border re-opening plans.

This economic impact is projected to be around $500m in 2022. The 'No COVID-19' scenario projected the economic impact would have been $3,580m in 2022. Under varying post COVID-19 scenarios for future onshore student numbers, the average economic impact is estimated to be within the range of $1,580-2,370m per year over the 2022-2030 projection period.

Student fees and other expenditure is projected to support around 930 additional indirect FTE in 2022. This estimate is around 85% lower than the estimates under the 'No COVID-19' scenario, where this impact was projected to have supported an additional 6,150 indirect FTE in 2022.

Over the 9 year projection period from 2022 to 2030, student fees and other expenditure are projected to support between an average of 2,670 to 3,920 additional indirect employment FTE, under varying scenarios for future onshore student numbers post COVID-19. These estimates are between 46-63% lower than the estimates under the 'No COVID-19' scenario over the same time period.

3.2.2 Visiting family and friends

Table 10: Variance of benefits from visiting family and friends in 2019 compared with 2022

	2019	2022	Variance
Gross Domestic Product ($m)	300	45	-260
Indirect employment[15] (FTE)	520	80	-440

In addition to their expenditure on tuition fees, living costs and tourism spend while studying onshore, international students commonly receive visits from friends and relatives during their time in New Zealand; some of these visits would not have otherwise occurred without the onshore presence of international students. The flow-on effect of this tourism expenditure contributes to local economic activity.

[15] Employment (the number of full-time equivalent (FTE) jobs created) created upstream in the supply chain as a result of fees, expenditure, and visiting family and friends tourism spend

Table 10 summarises the estimated economic impact of visiting family and friends tourism spend. Economic impacts under the 'conservative' post-COVID scenario have been presented for the 2022 projection results as this is the scenario closest to current Government border re-opening plans.

This economic impact is projected to be around $45m in 2022. The 'No COVID-19' scenario projected the economic impact would have been $340m in 2022. Under varying post COVID-19 scenarios for future onshore student numbers, the average economic impact is estimated to be within the range of $150-230m per year over the 2022-2030 projection period.

The relatively small amount of family and friends tourism spend occurring in 2022 is projected to support around 80 additional indirect employment FTE in 2022. This estimate is around 85% lower than the estimates under the 'No COVID-19' scenario, where this impact was projected to have supported an additional 590 indirect FTE in 2022. Over the 9 year projection period from 2022 to 2030, a gradual recovery in family and friends tourism spend is projected to lead to an average of 250 to 380 additional indirect FTE, under varying scenarios for future onshore student numbers post COVID-19.

A key caveat is that these estimates are based on the strong assumption that for the students receiving visits, none of these trips would have occurred without their onshore enrolment. There is no New Zealand data on the extent to which these visits would have occurred without onshore student presence and limited data on visitor numbers and spend. These estimates should be considered with caution given the uncertainty around these assumptions; as the true value of visiting family and friends may be considerably lower or higher than the values presented here.

3.2.3 Education and training exports

Table 11: Variance of benefits from education and training exports in 2019 compared with 2022

	2019	2022	Variance
Gross Domestic Product ($m)	220	240	25
Indirect employment (FTE)	370	420	45

Education can be exported across borders in the form of online services to offshore students such as distance learning and correspondence courses, and in the form of export goods and services such as teaching and learning materials and technologies, contracted teaching and consultancy services delivered outside of NZ. The export revenue earned by domestic providers of these goods and services contributes to economic activity in New Zealand. Education-related exports are an area where ENZ sees potential for growth in future years, particularly in a post-COVID environment and with possible shifts in education delivery models (e.g. increased use of technology in delivering education and training and expansion of remote learning delivery modes). For example, around 5,200 students enrolled in distance learning or offshore education from NZ education providers in 2020 compared to 2,800 in 2019.

The ENZ survey of exporters of education and training goods and services was the main information source for previous education export valuations, as there is no direct alignment between the export categories in Stats NZ's trade statistics and the definition of education exports used for valuations. An updated run of this survey was not available for the 2021 valuation; it is expected that COVID-19 has impacted exports, but it is unclear what the impact of post-COVID conditions on exports will be. As a result, education export revenue for 2022 onwards have been estimated using the future growth forecasts from the 2018 survey as a basis, along with scenarios developed with ENZ. These scenarios assume export revenue in 2022 onwards varies by +/-20% from the 'No COVID-19'

scenario. The CGE model has been used to estimate the associated GDP output and indirect employment FTE. There are several assumptions and caveats associated with these estimates. For further details on the methodology used refer to Appendix C.

Table 11 summarises the economic impact of revenue from education and training exports. The GDP output associated with this export revenue is estimated to be within the range of $190-290m in 2022 under the low and high post COVID-19 scenarios, along with 330-500 in additional flow-on employment FTE. Over the 9-year projection period the average annual GDP output is estimated to be within the range of $210-320m.

3.2.4 Cross subsidisation of teaching and research

In addition to the direct impact of tuition fees on the education sector's revenue and employment (described in section 3.2.1), international education revenue supports increased economies of scale in providers' teaching activities and can potentially cross-subsidise teaching and research activities - potentially increasing the capacity and capability of New Zealand's overall education sector with flow-on benefits for domestic students.

The size of the potential cross-subsidisation impact varies between the university, ITP and PTE subsectors, as well as between individual providers where some have higher or lower international student enrolments: in 2019, international students as a proportion of total equivalent full-time students (EFTS) ranged from 9-37% across different universities and 3-22% across different ITPs. For some PTEs international learners are the majority of their enrolments while others have considerably smaller or no international enrolments. There are challenges with quantifying cross-subsidisation at a sector level as education providers do not segment their costs by domestic and international student groups; however, the ratio of international student fee income to other income and funding sources provides some indication of international education's importance to providers' financial viability. Observations for each sector are summarised in Table 12 below.

These observations suggest that for the university and ITP sectors overall, while government funding is expected to cover the teaching costs for domestic students, international education contributes to providers' other activities and one-off expenditure and investment items, and is currently a material contributor to their financial viability. A reduction in expenditure on research and other one-off or non-teaching activities and cost reductions for teaching activities would be required in the continued absence of international learners. The tertiary sector has highlighted this longer term risk as being related to the immediate financial shocks experienced from the COVID-19 pandemic.

It is also important to acknowledge that the current government funding model for New Zealand's tertiary education system and other financial resilience factors also play a part in the extent to which each provider relies on international education revenue.

Finally, innovations in the goods or services offered in the international education market (for example, technology which enhances in-person or remote learning) can also potentially translate to and positively impact the capability of the domestic education providers, although this impact is difficult to measure at a sector level.

Table 12: The impact of international education on education provider income

Subsector	Overview
Universities	International education fees account for a substantial proportion of the sector's revenue. The fee surplus associated with international learners is higher than for domestic students and this surplus is used to cross-subsidise other teaching and research activities which are not otherwise fully funded. This may increase the range of study options available to domestic students, support current staff to student ratios, and support a higher amount of research activity. In 2019, international education accounted for 15% of enrolments and 19% of TEC funding and student tuition income. Assuming that TEC funding and domestic student fees covers the overall teaching costs for domestic students, if the average teaching cost per international student is similar to that of a domestic student then this would imply that around $178m from international student fees (7% of all TEC and student fee income) was available to support non-tuition related activities. The university sector experienced a gradual increase in international student enrolments over the 5 years to 2019 (up from 11% in 2014 to 15% in 2019) which suggests that an increasing proportion of the sector's non-tuition related activity expenditure was supported by international student revenue.
ITPs	International education supports greater economies of scale but does not cross-subsidise other activities to the same extent as in universities, as there is a smaller difference between international student fees and the amount of TEC funding and student fees per domestic student (i.e. smaller potential surplus from international education). In recent years the ITP sector has increasingly experienced financial sustainability challenges, with the majority of providers operating in a deficit position prior to the pandemic. International education has therefore been an important source of students and revenue to support their operations. This has been the case particularly for some regions where domestic enrolments have remained level or decreased and international learners are an increasing proportion of enrolments. In 2019, international education accounted for 15% of ITP enrolments and 20% of TEC funding and student tuition income. Assuming that TEC funding and domestic student fees covers the overall teaching costs for domestic students, if the average teaching cost per international student is similar to that of a domestic student then this would imply that around $38m from international student fees (4% of all TEC and student fee income) was available to support non-tuition related activities.
PTEs	For specific PTEs, international students represent the majority of enrolments and are the reason that the courses are available, as there would otherwise be insufficient economies of scale. Some of these PTEs provide specialised training (e.g. pilot training) which contributes to the capability of the education sector and helps domestic students fill specific jobs. Other PTEs are focused on the international education market and so have minimal impact on the skills base of domestic students.

3.3 Social impacts realised in the immediate-term

3.3.1 Outbound domestic students

Domestic students who study abroad for part or all of their tertiary education are also part of the international education sector. On returning to New Zealand they potentially add to the human capital of the workforce to the extent that they develop global competence, increased knowledge and skills as a result of their international exchange placements; examples of this include an increased ability to engage and work with people of different cultural backgrounds; improved confidence and maturity; a broader knowledge base and interpersonal awareness. (Refer to section 4.3.1 for a description of global competence and its potential value for domestic learners.)

The following table summarises the limited information available on outcomes for outbound domestic students. Overall, these observations suggest that outbound domestic students experienced positive impacts on their own development and skillsets, however the total impact on New Zealand's tertiary student population is low as only a small proportion of domestic students undertake overseas exchange. There is also an information gap around the impact on post-study employment and other learner outcomes. Should exchange and scholarship opportunities become a greater focus for future student cohorts post-pandemic, then this is an area that would benefit from increased data collection and exploration.

Table 13: Broader impact from outbound domestic students

Benefit	Description
Size of outbound domestic student cohort	The OECD's education statistics[16] show that a small proportion of New Zealand tertiary students study abroad (around 2%, or 4,401 in 2019), with numbers slightly lower than in previous years. Outbound students represent a slightly higher proportion of master's level students (7%) and doctoral level students (4%). In 2019 most outbound tertiary students were at bachelor's or equivalent level (67%), followed by master's or equivalent level (31%). (Note that these counts include New Zealand students who complete their entire study course overseas, as well as those who undertake overseas exchange as part of their completion of a New Zealand course.)
Indirect economic impacts	Possible indirect economic impacts from overseas exchange and scholarship placements described in the literature include: ► Increased workforce productivity, where overseas education enables these students to fill roles at a higher skill level and/or where there are skills shortages ► Increased employment earnings, to the extent that overseas education is associated with a wage differential relative to other domestic workers with similar qualifications and experience There is some evidence from other jurisdictions for graduates who have studied abroad having higher employment rates and wage differentials; however, it is unclear as to whether overseas study is a causal factor or simply associated with other characteristics that drive post-study outcomes.

[16] Data sourced from Organisation for Economic Co-operation and Development (OECD), https://stats.oecd.org/Index.aspx?DataSetCode=EDU_ENRL_MOBILE

Benefit	Description
Broader impacts	The Prime Minister's Scholarship (PMS) for Asia and Latin America is a government-funded programme that supports New Zealand domestic students with studying overseas.[17] The programme represents a small proportion of outbound students (around 7% in 2019 with 298 students). In 2021 an alumni survey[18] found that 93% of respondents believed that their scholarships had helped them become 'global citizens', 86% thought that it increased their employability and 78% believed it helped them formulate their career goals. Respondents also reported that they believed the scholarship provided benefits to New Zealand. For example, 93% say they increased awareness of NZ people and culture whilst on their scholarship, and 78% think it created an opportunity for them to be an ambassador for New Zealand. Surveys in other jurisdictions also reported similar responses from alumni; for example, an alumni survey[19] for students who completed exchange programs in conjunction with AFS Intercultural Programs[20] worldwide reported positive experiences. Of the 10,500 respondents, 87% of alumni say their program helped them become active global citizens, 60% volunteered after their exchange program, and 90% said it helped them communicate and collaborate with people from different cultures and backgrounds.

3.3.2 Housing and infrastructure impacts of learners while studying

In geographical areas with significant international student numbers, there is potential for increased pressure on capacity constrained services, limited housing supply and transport networks. However, the data available suggests that this appeared to be within manageable levels prior to the COVID-19 pandemic, given limited or no eligibility for most government-funded services, significant public transport usage and student accommodation concentrated close to locations of study such as university and polytechnic campuses, points that are expanded upon below:

- In New Zealand, international students have minimal rates of contact with the Ministry of Social Development or government-funded health services[21], largely due to their ineligibility for most of these support services.

- Studies from other jurisdictions also typically found that international students have low rates of contact with government health and social services, with a relatively young age profile and limited eligibility as contributing factors. Usage of university-based counselling services appeared to be similar or lower than that of domestic students, although this may not always reflect true underlying need with international students sometimes being hesitant to seek help.

- International student impacts on housing and transport infrastructure were described as being difficult to separate from those of domestic students, as both tended to concentrate in areas close to their education providers and where suitable

[17] Education New Zealand, Prime Minister's Scholarships for Asia and Latin America, sourced from https://enz.govt.nz/funding/prime-ministers-scholarships-for-asia-and-latin-america

[18] Education New Zealand (2021), Prime Minister's Scholarship Alumni Survey Summary Findings

[19] AFS Intercultural Programs (2019), Creating global citizens: The AFS effect: The impact of an AFS exchange on life and career.

[20] AFS Intercultural Programs is one of the Exchange Programme Organisations (EPOs) approved by the Government to operate secondary school student exchange programmes in New Zealand.

[21] Dasgupta, K. & Pacheco, G. (2017). Developing indicators of student wellbeing: A scoping exercise with the IDI

accommodation is available. The sharp reduction in onshore international students over 2020-21 provided some useful insights into how this group affected New Zealand infrastructure:

- Transport agencies saw a significant decrease in public transport usage from students (driven by a lack of international students alongside other movements such as the broader shift to studying online and movement restrictions affecting all student types)[22].

- Housing prices and rental costs continued to increase over the 2020-21 period despite the sudden drop in international students, with similar trends observed in housing markets in other countries with significant international student intake (e.g. Australia, United Kingdom). Some exceptions noted were for student-specific accommodation and some inner city suburbs with limited or decreasing domestic demand to offset the loss of international student renters.

3.4 Broader impacts for Māori realised in the immediate-term

International education has potential immediate term impacts for Māori across the economic areas described in section 3.2. This section describes areas of potential relevance for the Māori economy, while acknowledging that impacts are difficult to quantify given limited regional and sector profile information for Māori businesses.

Fees and expenditure have potential impacts for Māori businesses and workers through the direct and indirect impacts of expenditure across the New Zealand economy. In 2018 the Māori economy (Te Ōhanga Māori) represented 6.5% of national production GDP ($17bn out of $263bn)[23]. It is possible that a similar proportion of the GDP output estimated to arise from the international education sector may also flow through to Māori businesses.

Tourism spend from international learners and visiting family & friends also has some value to Māori tourism businesses, particularly in areas where international visitors represent a significant proportion of total tourism expenditure prior to COVID-19: Otago region is the area with the highest dependence on international visitors, with Rotorua, Kaikoura and West Coast regional tourist organisations also being other examples[24].

Other potential economic impacts for Māori include:

- International learners employed by Māori businesses post-study

- Cross-subsidisation of education sector capacity for domestic learners, particularly for regions and provider subsectors where Māori young people are a higher proportion of the 15-24 year old population and where international learners are a significant proportion of total enrolments

- Alumni contributions to trade links and demand for New Zealand products, for Māori exporter businesses

[22] New Zealand Transport Agency (2020), COVID-19 impacts on transport. Sourced from https://nzta.govt.nz/resources/covid-19-impacts-on-transport/.

[23] BERL (2020), Te Ōhanga Māori 2018 (The Māori Economy 2018), Reserve Bank of New Zealand

[24] Ministry of Business, Innovation & Employment (2020), Monthly Regional Tourism Estimates 2016-2020

4. Impacts realised in the longer-term

The large majority of learners return to their country of origin once they have completed study. There is evidence that international learners who remain continue to contribute significant economic, social and international benefits for New Zealand in the longer-term. In 2019 this included $5.9bn in contributions to our economy and around 73,000 in employment FTE. These impacts are projected to reduce significantly to $3.6-$5.1bn by 2030 as a result of minimal international student intake during border closures.

4.1 Summary

4.1.1 Key insights from post-study pathways

Key findings from the analysis of pathways of international learners who left study over 2009-19 include:

Residency and employment pathways

- **Most leave New Zealand within 1 year of finishing study**. 62% of international students who completed study over 2009-19 left New Zealand in the following year, with a further 13% leaving New Zealand in years 2-5 post-study. In recent years the proportion remaining in New Zealand has increased across all education subsectors. The proportion of learners who remain in New Zealand post-study also varies by provider category and qualification level, with ITP and funded PTE learners more likely to remain than university learners (Figure 3).

- **The majority of international students who remain in New Zealand after study transition into employment**, with a small proportion transitioning on to travel or other visas. 87% are employed at 2 years post-study, with 79% in full-time employment.

Employment sectors and occupations

- **Around 1 in 4 (23%) of former international students had transitioned into occupations categorised as being scarce or a long-term skills shortage[25] at 2 years post-study,** with examples including engineering, nursing and other health sector occupations and early childhood education teaching.

- Employment sectors that international learners transition into post-study vary by provider category and qualification level (Figure 4 and Figure 5). People with higher level qualifications (e.g. bachelor's or higher) are more likely to transition into professional, scientific and technical services; health care and social services; manufacturing and construction and education and training sectors. People with lower level qualifications are more likely to transition into accommodation and food services alongside health care and a range of other sectors.

- Generally speaking, people with higher qualification levels are considerably more likely to be in occupations with higher skills levels (Figure 6).

Refer to the insights report for further detail around the historic post-study pathways of international learners, as well as the definitions and methodology used.

[25] Sourced from Immigration NZ's 2019 Long Term Skill Shortage List and 2021 Resident Visa Scarce List

Figure 3: Proportion of international learners remaining in New Zealand by years post-study and subsector

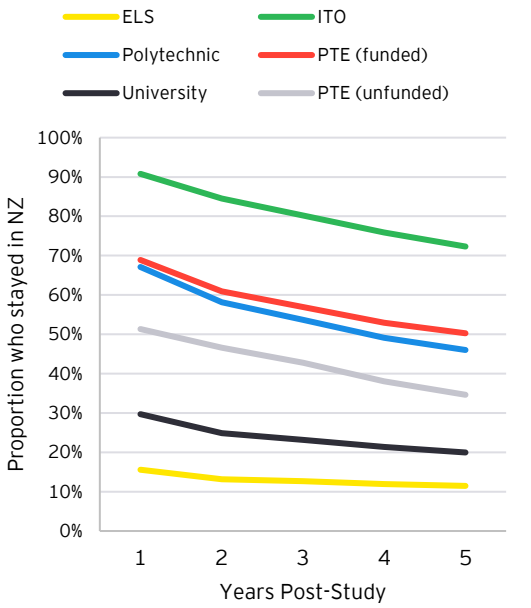


Figure 4: Proportion of post-study international learners employed by sector

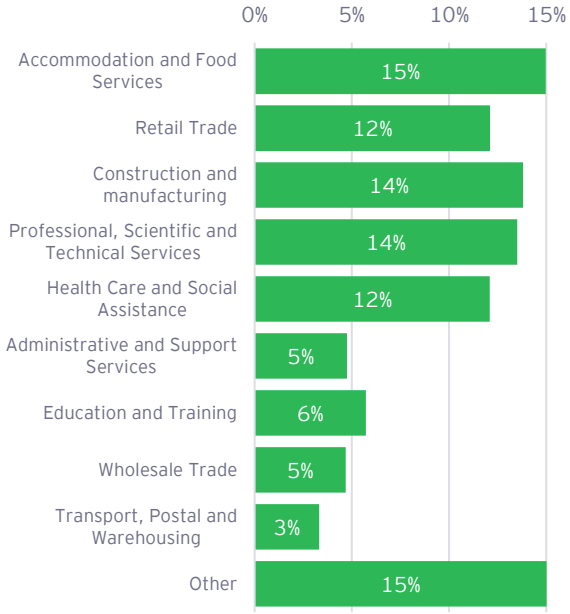


Figure 5: Proportion of post-study international learners employed by sector and qualification level

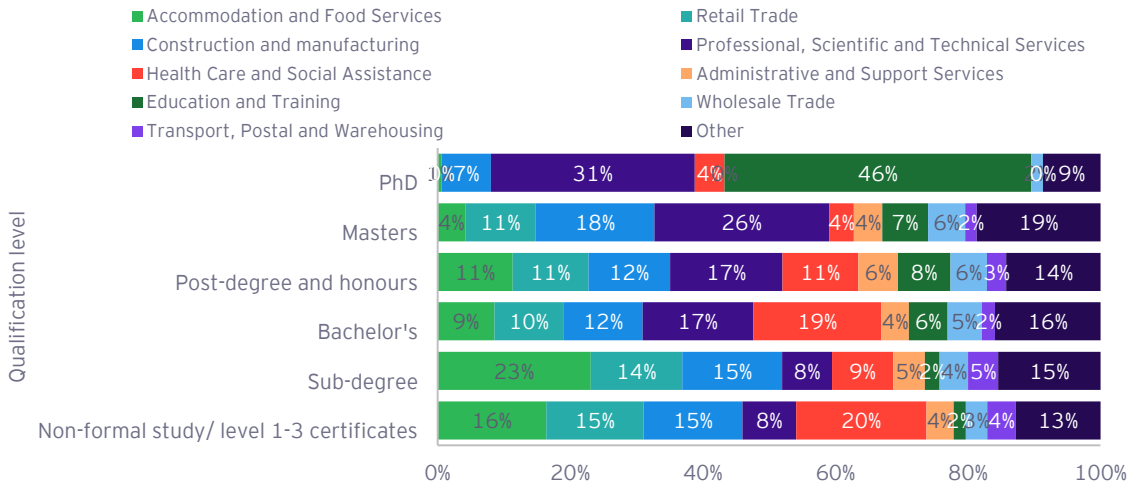
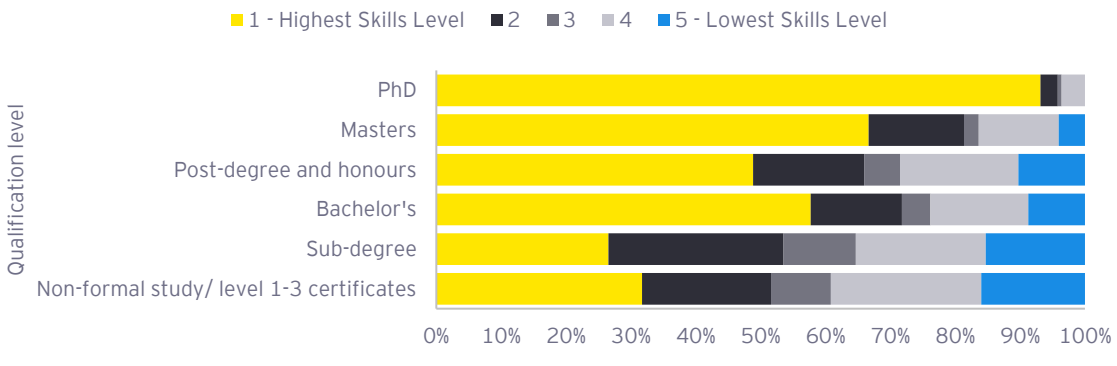


Figure 6: Proportion of post-study international learners employed by occupation skills level and qualification level



4.1.2 Total benefits realised in the longer-term

International learners who left study over the last 10 years and remain in New Zealand are projected to represent up to 73,000 in FTE employment and $6,085m in GDP output over the 2022 year. Employment and GDP impacts decrease by up to 60% in later years, reflecting the accumulated effect of 3-6 years of minimal international student intake on future labour supply contributions, and do not recover to pre-pandemic levels before 2030. These estimates reflect both the historical value that international education has contributed to the New Zealand labour market, as well as the potential future opportunity.

International students are also a source of skilled human capital and a subset contribute to research and development (R&D) while studying with higher education providers. GDP output may be lowered by an average of around $200-300m per year over the longer term (e.g. 2030-40) as a result of reduced education-based research expenditure and population tertiary attainment levels post-COVID.

There is evidence that international education can enable domestic students to develop **global competence** within a structured teaching environment, and contributes to **soft power in diplomacy, trade and perceptions of New Zealand** through a range of mechanisms, although these impacts were not directly quantifiable.

Table 14: Variance in longer-term benefits realised in 2019 compared with 2030, GDP output ($m)

Benefits realised in the longer-term	2019	2022	2030	Variance from 2019 to 2022	Variance from 2019 to 2030[26]
GDP output over year ($m)					
Labour supply and productivity	5,870	6,090	3,610 to 5,070	220	-800 to -2,260
Education based research and development	n/a – analysis relates to impact of variations only			n/a	-120 to -160
Human capital and tertiary education attainment	n/a – analysis relates to impact of variations only			n/a	-180 to -270
Non-monetised impacts					
Global competence and intercultural connections					
Housing and infrastructure impacts of learners post study					
International research collaboration and mobility					
Bilateral trade relationships					
Soft power in diplomacy, trade, and NZ Brand					
Total GDP output over year (monetised impacts)	5,870	6,090	3,610 to 5,070	220	-1,320 to -2,900*

** Including average yearly impact of reduced education-based R&D and human capital over the 2022-30 period*

[26] The timeframe over which variations are expected to impact GDP output depends on the impact type. For labour supply and productivity, variations in 2030 are expected to be realised in that same year. For education-based R&D and human capital, variations in 2030 are expected to be realised over a longer term period (e.g. 2030-40).

4.1.3 Total costs incurred in the longer-term

The previous section presents the net monetised benefits from international education on labour supply, education-based R&D and human capital over the longer term.

In addition to GDP and employment impacts, **the potential cost to domestic workers from wage impacts** as a result of international learners entering the domestic workforce were estimated as part of the CGE modelling approach. The estimated impact on wages across different occupation categories was close to null across all scenarios. This is consistent with previous New Zealand research[27] which has found very minor overall impacts on the average earnings and employment of local workers from immigration (noting that there may be specific sector and/or occupations where impacts are larger).

Post-study learners remaining in New Zealand and moving into the workforce have contributed to **infrastructure and housing pressures**, but it is difficult to separate this contribution from broader skilled migration settings, policy, and local supply and demand factors. Positive economic impacts from international learners who enter the workforce post-study are likely to outweigh negative effects on infrastructure and housing, although it is acknowledged this is a contested area with no definitive perspective.

[27] For example, New Zealand Productivity Commission (2021), Immigration - Fit for the future: Preliminary findings and recommendations.

4.2 Economic impacts realised in the longer-term

4.2.1 Labour supply and productivity

Table 15: Variance in labour supply and productivity benefits realised in 2019 compared with 2022 and 2030

	2019	2022	2030	Variance from 2019 to 2022	Variance from 2019 to 2030
Gross Domestic Product ($m)	Up to 5,870	Up to 6,090	Up to 3,610 to 5,070	220	-800 to -2,260
Total direct employment (FTE) [28]	Up to 73,885	Up to 73,080	Up to 36,400 to 52,850	-800	-21,035 to -37,485

A key impact from the education sector for New Zealand is the indirect effects of increased skilled labour supply on economic output. For the international education sector, this impact is realised via domestically trained international learners who transition into the local workforce after leaving study. Econometric studies often describe this impact as consisting of:

- Increased GDP as a result of releasing skilled labour constraints, particularly in sectors where there are skill shortages.

- Indirect effects from any income differentials between domestically trained skilled migrants and the domestic workforce. This includes any differences in incomes earned by NZ-trained skilled workers, as well as any impacts on incomes earned by other domestic workers.

CGE modelling was used to understand the potential economic value from international learners who have contributed to the New Zealand labour market in recent years, as well as the potential future outlook post COVID-19 disruptions. This involved estimating the GDP output and wage impacts associated with domestically trained international students who remained in New Zealand and transitioned into the domestic workforce in the 10 years leading up to each valuation year. These impacts were estimated as the difference between New Zealand's economic output with and without this group being a part of labour supply, assuming no change in the number of domestic or other skilled migrant workers in the workforce.

A strong assumption used in this modelling is that in lieu of international education, no substitutes would be available to make up the difference in FTE employment, and that therefore most of the labour supply impacts are attributable to the international education sector. In reality these economic impacts are partly attributable to broader skilled migration settings as well as the skills and training developed by New Zealand's education sector. In addition, the number of cohort years included in impact calculations (10) was selected arbitrarily and it could be argued that a smaller number of years should be considered when attributing impacts to education. As a result, the estimated values described in this section should be considered as the upper bound for the true value of international education's contribution to labour supply and productivity.

One option for splitting labour supply impacts between the education and migration systems is to estimate the proportion of international learners in the local workforce post-study who would be replaced by other skilled migrants in the absence of international education. There is no definitive answer to this somewhat hypothetical question, so the full estimated value of this impact has been presented in this section.

[28] Total employment FTE from international learners who have transitioned into the domestic workforce after leaving study

These impact estimates are influenced by several key assumptions that require scrutiny. These include:

- Long term assumptions around New Zealand's economic profile, including the size and profile of the domestic workforce and overall employment rates
- Labour supply elasticity (i.e. the sensitivity of labour supply to wage rates)
- Future migration settings and employment outcomes for international learners; these are assumed to remain similar to those applicable in recent years pre-pandemic (e.g. 2017-19)

Table 15 summarises the economic impact from increased labour supply and productivity due to international students entering the domestic workforce after study. Economic impacts under the 'conservative' post-COVID scenario have been presented for the 2022 projection results as this is the scenario closest to current Government border re-opening plans.

In 2022, international learners who left study over the last 10 years (2012-21) and remain in New Zealand are projected to represent around up to 73,000 in FTE employment over the year. The GDP output associated with this group is projected to be up to $6,085m over the year. This estimate is around 11% lower than that projected under a 'no COVID-19 scenario' due to the significant decrease in international student enrolments over 2020-21.

At the end of the 9 year projection period in 2030, the average economic impact per year is estimated to have decreased to levels ranging from $3,610m (conservative scenario) to $5,070m (optimistic scenario). These estimates are 40-57% lower than estimates under the 'no COVID-19' scenario, reflecting the accumulated effect of 3-6 years of minimal international student intake on future labour supply contributions. The employment FTE from international learners in the New Zealand workforce post-study is estimated to decrease by 41-60% to 36,400-52,850 by 2030.

Table 16 shows the estimated impact on wages across different occupation categories produced by the CGE model; this is close to null across all scenarios, suggesting that there is minimal or no negative impact on domestic workers overall from the addition of international learners in the workforce. This is consistent with other research, for example the Productivity Commission[29] considered both domestic and international evidence on how immigration affects the labour market outcomes of local workers. Overall, New Zealand studies find very minor impacts on the average earnings and employment of local workers.

Table 16: Wage impacts from labour supply and productivity

	Wage impact (% change)		
Occupation category	2019	2022	2030
Labourers; Machinery Operators and Drivers	-0.022	-0.014	-0.007 to -0.012
Clerical and Administrative Workers	-0.025	-0.016	-0.007 to -0.013
Managers; Professionals	-0.031	-0.003	-0.001 to -0.002
Sales workers; Community and Personal Service Workers	-0.075	-0.007	-0.003 to -0.006
Technicians and Trade Workers	0.007	-0.010	-0.005 to -0.009

[29] New Zealand Productivity Commission (2021), Immigration - Fit for the future: Preliminary findings and recommendations.

4.2.2 Education-based research and development

Table 17: Variance of benefits from education-based research and development in 2019 compared with 2030

	2019	2030	Variation in average yearly impact from 2019 to 2030 (These impacts are assumed to emerge over a longer term period, e.g. 2030-40)
Gross Domestic Product ($m)	n/a – analysis relates to impact of variations only		-120 to -160

International student researchers are a source of new ideas and contribute to R&D projects carried out while studying with higher education providers in New Zealand, including projects run in collaboration with private organisations or Crown Research Institutes. While Research and Development (R&D) performed in commercial sectors typically produces new goods and services, higher quality of output and innovation of production processes, in contrast, higher education R&D is associated with enhancing the knowledge stock available for society. This in turn can lead to developments in business research, new educational methodologies, or even technology innovations that can boost output directly.

The literature describes two pathways by which public research (including higher education R&D) contributes to long term economic productivity30:

- Commercialisation, where R&D translates directly into innovation through means such as product development, intellectual property (IP) patents and licenses, new services and ventures

- Knowledge transfer, where human capital is deepened through the mobility of students and researchers between education, government and industry sectors and across international borders, through collaborative projects and networks connecting researchers to industry

Economic impacts from international education's longer term contribution to New Zealand's human capital and education-based R&D were estimated for this valuation. There are other broader impacts from international education on New Zealand's R&D sector which are notable, although their monetary impact has not been estimated for this valuation given their intangible nature. These are described further in section 4.5.1.

The methodology used to estimate the potential longer term economic impacts was derived from a 2015 valuation of university-based R&D's economic impacts in Australia[31]. The original analysis took into account a variety of factors[32] and applied them to estimate the impact that higher education research and development (R&D) spending will have on the GDP of a country. Using this model as a conceptual underpinning, a New Zealand specific econometric model that estimates the overall GDP impacts from higher education R&D spending and population tertiary education attainment was developed. Detailed methodology is set out in Appendix C.

The regression analysis found that higher education R&D expenditure on GDP was a statistically significant predictor of output growth. A one dollar per capita increase in higher education R&D spending increases year-on-year output by $3 per capita in the longer term, according to our model. A caveat is that there is considerable uncertainty

[30] OECD (2013), Commercialising Public Research: New Trends and Strategies

[31] Deloitte Access Economics (2015), The importance of universities to Australia's prosperity.

[32] Tertiary education attainment, population growth, gross capital formation, expenditure on higher education R&D, expenditure on other R&D, total trade as a % of GDP

around estimates of the extent to which education-based R&D directly contributes to output growth in the New Zealand context.

This econometric analysis was used to estimate the effect of declining international student numbers on higher education R&D spending in the immediate term and GDP output in the longer term. Education-based R&D funding under each post-COVID scenario was estimated by assuming that funding shifts in proportion to tertiary student enrolments and that funding levels per higher education student enrolment remain at 2019 levels:

- Under a conservative scenario, international learner enrolments are estimated to be 15-74% lower across 2022-30 than in 2019. Assuming this is reflected in reduced education-based R&D expenditure, this is estimated to result in an average decrease in GDP output per year of $160m from 2019 levels which would emerge over a longer term timeframe (e.g. 2030-40).

- Under both the neutral and optimistic scenario, international learner enrolments are estimated to be 8-75% lower across 2022-30 than in 2019, resulting in a $120m average decrease in GDP output per year from 2019 levels which would emerge over a longer term timeframe (e.g. 2030-40).
  Under these scenarios higher education enrolments are forecast to return to levels close to pre-pandemic levels by 2028 onwards.

In interpreting these results, it is important to note that there is a large degree of uncertainty associated with these estimates, due to uncertainty around how policy decisions underpinning higher education R&D funding might shift if international student researcher numbers continue at reduced levels. Most tertiary R&D funding is provided by central government through performance-based research funding (PBRF) and other government supported research grants. The total value of this funding is set exogenously through the annual budget process and then distributed to tertiary education providers via various mechanisms (e.g. research proposals). Furthermore, while outside the scope of this report, it is also worth noting that 72% of private industry R&D is self-funded with another 11% coming from government[33]. The impact of international education on these vectors is also highly uncertain.

4.2.3 Human capital and tertiary education attainment

Table 18: Variance of benefits from population tertiary education attainment in 2019 compared with 2030

	2019	2030	**Variation in average yearly impact from 2019 to 2030** (These impacts are assumed to emerge over a longer term period, e.g. 2030-40)
Gross Domestic Product ($m)	n/a – analysis relates to impact of variations only		-180 to -270

International education contributes to an increase in New Zealand's overall human capital from the skills and knowledge of higher education international graduates who transition into the New Zealand workforce after study. This leads to longer term productivity impacts from an increase in the education attainment of the workforce, and builds on the immediate impact of labour supply contributions described in section 4.2.1.

The econometric analysis outlined for education-based R&D (section 4.2.2) was also used to estimate the longer term impact a change in international student numbers would have

[33] Statistics New Zealand, Research and development survey: 2020 sourced from https://www.stats.govt.nz/information-releases/research-and-development-survey-2020

on GDP output, based on their impact on the tertiary education attainment rate of the overall New Zealand population. This modelling represents a scenario about what could occur over time from the current reductions in international student numbers, assuming no other changes to the domestic population's tertiary attainment levels.

The regression analysis indicates that as a higher proportion of the population aged over 15 years obtains a **tertiary qualification**, the country's output per capita increases. A one percentage point increase in tertiary education attainment is estimated to lead to an increase of $183 in GDP per capita per year in the longer term.

Three potential 'post-COVID' scenarios were modelled (as used elsewhere in this report) and compared to 2019 levels. Because tertiary education attainment is based on course completion rates and the proportion of students that remain in New Zealand post-study, the effect of lower international student enrolments does not become immediately apparent but increases over the following 10 year projection period. The recovery pathways emphasise this effect as shown by the estimated impacts over 2022-2030:

- Under a **conservative scenario**, tertiary attainment is estimated to be 0.51% lower by 2030 than in 2019. This results in an average decrease in overall GDP per year of around $270m which would emerge over a longer term timeframe (e.g. 2030-40).

- For the **neutral scenario**, tertiary attainment is estimated to be 0.39% lower by 2030 than in 2019 and this corresponds to an average decrease in overall GDP per year of around $220m emerging over a longer term timeframe (e.g. 2030-40).

- Under the **optimistic scenario** tertiary education attainment is estimated to be 0.32% lower than in 2019, and this corresponds to an average decrease in overall GDP per year of around $180m emerging over a longer term timeframe (2030-40).

Under all three scenarios, by 2030 the negative GDP effects from the forecast decrease in international students are still flowing through. This shows the significant lag effect that reduced international student enrolments potentially has on longer term GDP output without alternative contributions to human capital.

4.3 Social impacts realised in the longer-term

4.3.1 Global competence and intercultural connections

Benefits for New Zealand students and broader communities arise when international students enable New Zealanders to engage with their home cultures and develop global competence (sometimes also referred to as intercultural competence or international capabilities), such as the ability to work collaboratively with people from different cultural backgrounds, effectively adapt to interpersonal differences, and develop knowledge of other people's values and perspectives. International students similarly benefit from opportunities to interact and work with local students, experience and develop an understanding of New Zealand's culture, values and education system.

The US Council of Chief State School Officers[34] describes global competence as essentially representing two core capacities: "the capacity to recognise perspectives (others' and one's own) and the capacity to communicate ideas effectively across diverse audiences". The OECD[35] describes global competence as being able to:

- examine local, global and intercultural issues
- understand and appreciate different perspectives and world views of others
- interact successfully and respectfully with others
- take action for collective wellbeing and sustainable development

Global competence is described as an important skillset for people to develop within societies that are multicultural and impacted by global issues such as New Zealand's, as well as for organisations that have diverse workforces, trade or have links internationally[36,37]. The Ministry of Education states that "the development of skills, knowledge and capabilities that are needed to live, work and learn across cultural and national boundaries is a valued outcome of the New Zealand education system"[38]. This is reflected in New Zealand's International Education Strategy[39] which includes a goal around developing global citizens, through providing opportunities for domestic learners (as well as international students) to develop these skills and to make global connections.

Onshore international learners can contribute to domestic learners' experiences and build links with the broader community in a range of ways, such as through joint problem-solving and teamwork, volunteering, developing study-based and social networks with domestic students and other community members and groups. Virtual programmes have also been developed in recent years to facilitate interactions between domestic and offshore international students; an example is the New Zealand Global Competence Certificate (NZGCC) programme facilitated by Massey University, which aims to develop the ability of school students to communicate and connect directly with their overseas student counterparts.

A positive feature of international education is that it provides a unique opportunity for domestic students to build global competence while remaining in New Zealand, over and above the limited number of students who undertake overseas exchange. This is important for providing a wider population of domestic learners with opportunities to develop these

[34] Mansilla, V. B., & Jackson, A. W. (2011). Educating for Global Competence: Preparing Our Youth to Engage the World. Council of Chief State School Officers

[35] OECD (2017), The OECD PISA global competence framework

[36] OECD (2017), The OECD PISA global competence framework

[37] Ministry of Education (2014), International capabilities: A summary report for schools

[38] Ministry of Education (2020), PISA 2018 Global Competence of New Zealand 15-year-olds

[39] New Zealand Government (2018), International Education Strategy 2018-2030

skills, including students who might not otherwise interact with people of different cultural backgrounds or who have limited access to overseas exchange opportunities. One of the findings from the Programme for International Student Assessment (PISA) 2018 for New Zealand students[40] was that the self-reported global competence measures were lower for socio-economically disadvantaged students and those from a non-immigrant background than for their peers, particularly for attitudes towards immigrants, respect for and interest in other cultures, perspective-taking, and agency regarding global issues. "Differences may be attributed to varying opportunities to learn, as reported by students themselves"[40].

The following table summarises the research available around global competence and intercultural connections with international students from three perspectives: those of the New Zealand community, domestic and international students respectively. Overall, these observations suggest that international students currently contribute to the communities they live in (e.g. via volunteering or adding to the cultural diversity of the places they live in), but that there is also significant potential to support greater ties and engagement with domestic students and the broader community as part of the sector's post-pandemic recovery. In particular, there is evidence that domestic and international learners are more likely to report positive global competence outcomes when student-to-student interactions are facilitated within a structured programme or approach.

Table 19: Research findings around global competence and intercultural connections relating to international learners

Benefit	Description
Domestic students	There are few New Zealand studies exploring the interactions between international and domestic students from the perspective of domestic students. A previous literature review prepared for the Ministry of Education[41] and subsequent survey of students and teachers[42] found that in general "domestic students hold relatively favourable perceptions of international students" but that the extent of cross-national interaction was "generally low" as students tended to remain within their own groups. This is consistent with the experiences of international students (highlighted below) and observations from other jurisdictions. Various studies have observed that structured teaching and learning approaches are required to increase meaningful interactions between domestic and international student groups. Approaches with evidence of positive impact on intercultural engagement include peer-pairing programmes, co-operative learning strategies and residential programmes[39]. For example, one Australian study[43] explored a range of strategies employed by university staff respondents to successfully encourage intercultural student engagement and learning, such as developing group projects which require collaboration to pool diverse student knowledge in order to solve problems, and staff supporting peer interactions to develop in-person or virtual 'communities of learning'. Research is limited on the post-study outcomes experienced by domestic students who engaged with international learners. One US study[44] found that graduates of four private research universities surveyed 5, 10 and 20 years after graduation, who reported substantial interactions with

[40] Ministry of Education (2020), PISA 2018 Global Competence of New Zealand 15-year-olds

[41] Ward, C. (2001), The impact of international students on domestic students and host institutions, Ministry of Education

[42] Ward, C. (2005), Interactions with international students, Education New Zealand

[43] Arkoudis, S. et al. (2010), Finding Common Ground: enhancing interaction between domestic and international students, University of Melbourne.

[44] Luo, J. & Jamieson-Drake, D. (2013). Examining the educational benefits of interacting with international students

Benefit	Description
	international peers during study, reported higher levels across a range of global competence measures (e.g. relating to people of different backgrounds and acquiring new skills or knowledge independently) than other respondents. Though it is unclear whether this link is causal or reflective of other characteristics which led to respondents experiencing these post-study outcomes. A recent study of New Zealand and Australian students' sentiments towards international students during the COVID-19 pandemic[45] found that the majority of domestic students reported positive changes in their attitude to international students. Attitude changes were reported in relation to practical hardships associated with living away from home and social isolation (around 80% of respondents) but also their desire to be part of the community (78% of respondents) and their diversity of backgrounds (75% of respondents). The findings in this report signal the willingness of domestic students to meaningfully engage with international students and the potential to support greater ties between these cohorts.
International students	One common theme found in student experience surveys[46], and other research, is that students found New Zealanders to be friendly but also found it challenging to make real friendships with local people. The studies which examined structured approaches for enhancing intercultural engagement with domestic students (described above) also described benefits reported by international students as a result of interacting with domestic students, including effective learning, "increased awareness and understanding of different perspectives", improved communication skills for the workplace, and social networking. International learners also contributed to the community through involvement in volunteering while studying. The International Student Experience Survey 2021 carried out by ENZ reports around 1 in 4 (23%) students took part in volunteering during their time in New Zealand. Furthermore, 9% reported having volunteered[47] in the 4-week period prior to the 2018 Census.
Community	The 2021 Survey of New Zealanders' perceptions of the International Education Sector carried out by ENZ and TRA[48] found respondents ranked core wellbeing areas of health, housing affordability, education and job security as being the issues of greatest importance, with cultural diversity and hosting of international visitors being one of the lower priority issues. However, when respondents were asked specific questions about the benefits of international education, 42% agreed that 'they [international students] bring a multicultural element to New Zealand's communities' and 34% agreed that 'they bring different perspectives to New Zealand and our classrooms'.

[45] Lawrence, R. & Ziguras, C. (2021), Student Voices: Domestic cohort engagement with international students through COVID-19 research report, International Education Association of Australia.

[46] NielsonIQ (2021), International Student Experience Survey 2021.

[47] Volunteering was defined as answering yes to any of the following questions in the 2018 Census under unpaid activities: Helping someone who is ill or has a disability outside household, Looking after a child outside household or Other helping or voluntary work for or through any organisation, group or marae.

[48] TRA (2021), Perceptions Towards International Students in a COVID-19 World.

Benefit	Description
	The 2019 iteration of this survey[49] also included open feedback from survey respondents which highlighted the ways in which they perceived the potential benefits of community participation and cultural diversity. For example, "the overseas students typically want to learn as much as possible about New Zealand and its culture, and the student would also want to tell the New Zealand family about their country and culture etc. There is a two-way exchange happening here with the result being an enhanced understanding of the two different cultures."

In reviewing these findings, it is important to acknowledge that the evidence available (and gaps in the knowledge base) is often influenced by the ideological basis for global citizenship prevailing within each jurisdiction's education system, along with other unique characteristics of each jurisdiction's education system and broader society. For this reason there would be value in future research around:

- Global competence outcomes experienced by domestic tertiary students
- The extent to which global competence outcomes can be achieved under a structured approach within New Zealand schools or tertiary education institutions
- The broader applicability of global competence to New Zealand workplaces (e.g. the extent to which New Zealand employers value the knowledge and skills that make up 'global competence')

4.3.2 Housing and infrastructure impacts of post-study learners who remain in New Zealand

For post-study learners remaining in New Zealand and moving into the workforce, the positive economic impacts from their labour supply and productivity contributions (section 4.2.1) are intrinsically linked with increased population demand for housing, infrastructure and services over immediate and longer term timelines. In this sense, post-study learners have contributed to negative externalities as a component of a broad range of other demand drivers over the last few decades (e.g. broader migration flows, natural population growth) alongside constraints on housing supply, transport infrastructure and the capacity of health, education and social services.

In the 2019 ENZ survey of New Zealanders' perceptions of international education[49], community respondents said the greatest challenge associated with the sector was the impact that the influx of international students and their families were having on New Zealand's housing system, job availability and access to education and medical services which were seen as already being strained. Aucklanders were more likely to see challenges posed by international education while respondents from Canterbury, Wellington and other regions with a smaller international student and migrant population were less likely to perceive pressures.

A key challenge with assessing the scale of these impacts is that (as with labour supply impacts) they are attributable to broader migration settings, other policy and local supply and demand factors, not just the international education sector. There is no single answer to the question of the extent to which these impacts belong to international education.

- One argument is that the international education sector would exist to some degree even if there were no post-study pathways to work and residence (although it would likely be smaller as post-study pathways are a feature sought by some learners), and

[49] Kantar (2019), Understanding New Zealanders' perceptions of international education.

that other migrants would have made up the shortfall in post-study learners; therefore, all of these impacts should be attributed to broader migration settings and other factors.

- The counter-argument is that international education enrolments are at least partially linked to post-study work and residence settings, and so it is only appropriate to attribute some of the value of negative externalities associated with migration to international education.

- Separate viewpoints also exist around the extent to which the costs of rising house prices and rents, housing shortages, transport pressures and increased health and social service usage are attributable to migration versus other policy and population factors. The New Zealand Productivity Commission recently reviewed the evidence for effects of immigration on broader wellbeing impacts including housing and infrastructure[5051] and noted challenges with accurately establishing causal relationships and the relative importance of different factors. A preliminary finding was that population growth from net migration (of which immigration is one component) has "exacerbated rapid house price increases, reflecting several factors including underlying and persistent constraints on the supply of housing", and recommended that future migration settings be set with closer reference to skills shortages and planned housing and infrastructure supply.

In conclusion, it is likely that the positive economic impacts of post-study learners currently outweigh the negative effects from contributions to infrastructure, housing and service usage pressures over the long term, although it is acknowledged this is a contested area with no definitive perspective. In its review of the immigration system, the New Zealand Productivity Commission noted approaches for mitigating negative effects including that "most negative effects of immigration on wellbeing can be reduced by keeping the speed of arrival within absorptive capacity [of housing and infrastructure]".

4.4 Broader impacts for Māori realised in the longer-term

There are several aspects of international education across the valuation framework which have potential impacts for Māori, including Māori learners, Māori education providers, the Māori economy and iwi.

While the value of international education for Māori can ultimately only be determined by Māori, a useful framework for considering the potential direct impacts of international education for Māori is the Ministry of Education's expectations of ENZ around Te Tiriti o Waitangi[52], including:

- Partnering with iwi, Māori and Māori providers of education services to transform the understanding of international education and ensure the education system delivers with, and for, Māori in the international context.

- Supporting education in te ao Māori, tikanga and te reo Māori as part of the international educational offer.

[50] New Zealand Productivity Commission (2021), Immigration – Fit for the future: Preliminary findings and recommendations

[51] New Zealand Productivity Commission (2021), The wider wellbeing effects of immigration. Working paper No. 2021/07.

[52] Ministry of Education (2021), Education Report: Education Crown Entity Letters of Expectations 2021, sourced from https://assets.education.govt.nz/public/Documents/our-work/information-releases/Advice-Seen-by-our-Ministers/January-2021/15.-1244606-ER-Education-Crown-Entity-Letters-of-Expectations-2021_Redacted.pdf

- Presenting New Zealand's educational system to the world in a way that acknowledges the importance of Te Tiriti and a Māori world view.

- Ensuring international students are exposed to the Māori world view as something unique to New Zealand and of international applicability and benefit.

- Ensuring Māori enjoy and achieve education success as Māori as they develop the skills to participate in te ao Māori, Aotearoa and the wider world (Ka Hikitia – Ka Hāpaitia).

These expectations suggest three potential direct impact areas for Māori learners, iwi, organisations and education providers, summarised in the table below. There are few data points on the extent to which these are being realised at present, suggesting that the impact of international education for Māori has potential for future growth and development. Impacts for outbound Māori exchange students are perhaps the area with the greatest potential for enhancement in the immediate term post pandemic.

Table 20: Potential direct impact areas for Māori

Benefit	Description
Outbound international education for Māori students. Those who study abroad, develop global competence, networks, knowledge and skills and apply these on returning home can contribute to economic benefits and cultural development for Māori businesses, organisations and iwi as well as New Zealand as a whole.	Section 3.3.1 summarises the information available on impacts realised by outbound domestic students overall, and concludes that while alumni report a range of positive benefits from their overseas experiences, only a small proportion of students are involved in these exchanges – constraining the impact for New Zealand's student population overall. Māori student involvement in overseas exchange appears to also be relatively low. University of Auckland noted that in 2017, Māori students represented 5.6% (67) of those that completed an overseas experience compared with 8.7% of all undergraduate students. Māori students represented 2.9% of the national aggregate (Studymove Consultants, 2018). This suggests a participation gap within the organisation as well as low levels of involvement nationally.[53] Positive anecdotal feedback from Māori alumni of student exchange programmes demonstrate the potential range of positive impacts that could be realised. Examples such as the Prime Minister's Scholarships[54] and Waikato University and Centres of Asia-Pacific Excellence's Te Hononga-ā-Kiwa programme[55] describe student feedback around the impact on their personal development, language skills, knowledge of indigenous cultures and businesses and New Zealand's bilateral links with exchange countries, and the development of networks with other participants.
Providing international learners with exposure to Māori culture and the Māori world view, with	Examples of two-way cultural and knowledge exchanges include: ► Partnerships for student exchange at universities, wānanga and other educational institutions focused on indigenous students and/or with a focus on indigenous

[53] Faure Kilgannon, L., Moore, A. & Berquist, B. (2020). Increasing Māori participation in learning abroad. University of Auckland.
[54] For example: Education New Zealand, Cultural exchange in Colombia sourced from https://enz.govt.nz/news-and-research/student-stories/cultural-exchange-in-colombia/
[55] Sourced from https://sites.google.com/view/tehononga-a-kiwa/home

Benefit	Description
alumni sharing these globally when they return home. In particular, two-way exchanges of knowledge and culture between Māori and overseas indigenous learners can contribute to ongoing connections between Māori and indigenous groups overseas.	development areas, such as the University of Otago's Tūrangawaewae, Pōkai Whenua program. ► A bilateral government arrangement between New Zealand and the US around the Gilman International Scholarship program, which supports US learners of limited financial means to study in New Zealand. Education NZ has a focus on indigenous student mobility for this program. ► Indigenous and cultural development as a field of study in higher education open to postgraduate international students. To date there has been a small intake of international student in these courses at wānanga (e.g. 12 students enrolled in 2019). More generally, international students provided positive commentary in experience surveys[56] around being able to learn more about Māori culture, although some noted opportunities to improve in this area.
Other opportunities for exchange and reciprocity within the international education sector which potentially benefit Māori learners, iwi and Māori education service providers. Global indigenous knowledge forums and exchange around priority focus areas for Māori researchers, such as sustainable development, may be particularly relevant.	This includes the international exchange of knowledge, skills or culture or through hosting and relationship forming. This can be facilitated through researcher and academic staff mobility, as well as through joint research initiatives and knowledge sharing forums. Recent examples include: ► Ongoing work with New Zealand agencies and the US National Science Foundation (NSF) around research collaboration. Recent events included a series of research exchange sessions under NSF's MULTIPLIER programme (MULTIPlying Impact Leveraging International Expertise in Research Missions), focusing on priority research areas relevant to indigenous communities such as indigenous language revitalisation, food security and sustainability[57]. ► Existing research partnerships and connections between Māori and overseas indigenous groups at universities, wānanga, and other educational institutions. For example, Waikato University's Te Hononga-ā-Kiwa programme in partnership with Centres of Asia Pacific Excellence, which aims to increase Māori business capability and awareness and improve Māori business engagement in the Asia Pacific region for Māori tertiary students and businesses.

ENZ is currently undertaking a long term work programme in partnership with iwi, Māori and Māori providers of education services to identify future potential directions of international education for Māori and to better understand impacts at a more detailed level.[58] This includes the formation of a new group of Māori alumni from the Prime Minister's Scholarships programme, Kāhui Kaupapa.

[56] NielsonIQ (2021), International Student Experience Survey 2021; NielsonIQ (2020), International Student Experience Survey 2019.

[57] Sourced from https://enz.govt.nz/assets/2021-199-SIGNED-ENZ-briefing-Indigenous-Education-Engagement-in-North-America-Final.pdf and https://enz.govt.nz/news-and-research/ed-news/reaching-a-milestone-the-first-series-of-us-and-nz-virtual-information-exchange-sessions/

[58] https://enz.govt.nz/news-and-research/ed-news/rautaki-maori-update-march-2022/

4.5 International impacts realised in the longer-term

4.5.1 International research collaboration and mobility

In addition to the economic impacts from education-based research and development, there is some overlap between the international education sector and initiatives around international research collaboration and researcher mobility. These aspects positively contribute to the capacity and capability of New Zealand's research sector and are summarised in the table below, along with a case study illustrating the mechanisms by which international student researchers practically contribute to New Zealand research and innovation.

Table 21: Broader contributions from international education to the research sector

Impacts	Overview
Early and mid-career researcher pipeline	International education contributes to the pipeline of early and mid-career researchers in New Zealand. 34% of masters and 50% of doctorate enrolments in 2019 were international learners, and as such they form a substantial portion of the future potential pipeline for academic researchers. They can also bring new ideas and knowledge from their overseas experience, which can benefit collaborative research teams. This contribution has significance for innovation in both public and industry sectors over the long term. New Zealand's research sector currently captures limited data around the extent which researchers undertake commercialisation or transfer knowledge across entities (outside research publication measures), whether they be domestic or international. However, anecdotal examples (such as the KiwiNet example below) help to illustrate how international researchers contribute innovation in New Zealand, including those who completed postgraduate studies here.
International research collaboration	There is some overlap between international education and international collaboration on research initiatives, through international students involved in postgraduate research and through reciprocal partnerships between New Zealand and overseas tertiary organisations which support student researcher mobility. Alumni can also be involved in post-study collaborations and researcher networks with New Zealand academia or industry after returning home. International research collaboration has been described as facilitating the reciprocal sharing of knowledge, techniques and skills, researcher networks and ideas for innovation across international borders[59]. This is particularly important for New Zealand as a country with a small R&D sector relative to other nations.

[59] Knight, J. (2019), Knowledge diplomacy in action, British Council

4.5.2 Case study: KiwiNet Innovation Network and the Emerging Innovator programme

KiwiNet is an independent entity formed as a collaboration between eight Crown Research Institutes (CRIs), seven universities, three independent research organisations and Callaghan Innovation, representing around 80% of New Zealand's publicly-funded researchers. Through KiwiNet these organisations pool PreSeed Accelerator funding to achieve economy of scale for the commercialisation of publicly-funded research.

KiwiNet's Emerging Innovator programme was established in 2015 to guide and support scientists through the research and development (commercialisation) phases of creating potentially commercial products. Since 2015, 82 science researchers have completed the KiwiNet Emerging Innovators programme and 17 have gone on to lead or undertake a key role in a spin-out or start-up company. International researchers represent around 50% of both cohorts.

KiwiNet anecdotally attributes high international researcher participation in the Emerging Innovators programme and in other commercialisation initiatives to the following factors:

- International student researchers are a significant proportion of postgraduate cohorts
- International researchers in New Zealand's research sector often come from highly-competitive and entrepreneurial environments

There are likely to be positive self-selection effects, in that those who have taken the risk of relocating to New Zealand are more likely to be entrepreneurial and have a less risk averse mindset. "They are very open to trying something different, especially where there is an opportunity to pursue funding (i.e. commercialisation resources) in New Zealand's highly-competitive research funding environment."

4.5.3 Bilateral trade relationships

A positive impact from international education often discussed in the literature comes from the potential links between international education, migration and bilateral trade. This includes the potential for alumni to:

- Foster long term trade links, via the intercultural skills and experience developed from their New Zealand pathway. This includes international students who transition to the domestic workforce and support export trade by onshore firms, and international alumni who leave New Zealand and support trade links as part of overseas businesses.
- Generally contribute to positive consumer sentiment towards New Zealand goods and services in their home country.

It is difficult to attribute the direct contribution that international education has had on New Zealand's trade relationships, given that the impact of positive attitudes to host country's exports and positive relationships with host country firms is realised over the long term, and occurs alongside a wide range of external factors (e.g. broader trade initiatives, shifts in international demand for export goods, supply side factors). There is also no clear answer as to whether this relationship is causal or if both student and trade flows are driven by other factors.

To provide some sense of the extent to which international education might be associated with trade flows over a long term period, statistical analysis was performed on international student enrolments and bilateral trade flows between New Zealand and selected countries of interest. Analysis results varied between countries and in general do not appear to indicate that international student numbers directly increase trade openness. Statistical testing suggested a level of correlation between international student numbers and bilateral trade flows for some countries, including China, North America (USA and Canada), and South Korea.

- **China** was the only country in the analysis where an increase in student numbers was shown to precede trade openness. The data for China was also tested to determine whether trade flows appeared to be predictive of student numbers, but this was found to be statistically insignificant. This adds confidence to the finding that there is a relationship between lagged international student numbers and trade flows.

- South **Korea and North America** appeared to have some statistical correlation between trade flows and international student numbers. There appears to be a weak but inverse relationship between trade flows and international student numbers; that is, trade openness precedes an increase in international student flows.

- India's international student enrolments and trade flows with New Zealand appeared to move independently from each other. No statistically significant relationship was found between international student numbers on trade flows, or on lagged trade flows on international student numbers.

Further details on the approach and results are set out in Appendix C.

4.5.4 Soft power in diplomacy, trade, and New Zealand Brand

'Soft power' is the ability to obtain desired political, economic or cultural outcomes through attraction and persuasion, rather than coercion and/or payment. In the literature it is often argued that soft power can be utilised as a foreign policy lever to help influence diplomatic and political relationships, enhance trade relations and develop the 'brand' a country has overseas which can influence demand for its products and cultural impact. International students develop a unique relationship with New Zealand and can help to increase New Zealand's soft power with their home country, while onshore and after they return home.

International education has been considered by governments as a contributor to soft power for several decades. New Zealand has been involved in the 'Colombo Plan' from its inception in the 1950s with the aim of strengthening relationships within the Asia Pacific region through donor support for economic and social development in member countries. This included scholarships and other programmes supporting the education of students from developing countries, effectively helping to build human capital while also developing political, diplomatic and trade contacts and relationships. Some studies describe the first cohorts of international students in New Zealand as contributing to changing New Zealanders' perceptions around the country's relationship with the Asia Pacific region, "to see international educational aid as crucial to developing positive relationships with Asia and to economic development and regional security"[60]. New Zealand's international education sector expanded considerably from the 2000s and education providers now also have a role alongside government in supporting scholarships and exchange, alumni networks, research alliances and other partnerships with overseas organisations.

There is evidence that international education contributes to soft power in diplomacy, trade and perceptions of New Zealand through a range of mechanisms, and that soft power in turn positively influences student flows. Examples are outlined below.

- **Longer term contributions to soft power in diplomacy, trade and perceptions of New Zealand:** Representatives from the Ministry of Foreign Affairs and Trade (MFAT) described international education as being a key contributor to New Zealand's relationships with other countries at a government agency level over the long term, "winning minds and hearts". This impact is considered to be realised over a decades-long timeframe rather than as an immediate effect. Collaboration between ENZ and MFAT takes several forms including Ministerial or official visits, co-hosted events and support for scholarship or aid initiatives.

  A key example of this is the Manaaki New Zealand (NZ Aid) Scholarships programme administered by MFAT which funds over 1,200 scholarships each year across 92 countries, primarily in the Pacific and ASEAN regions. This accounted for $85m in funding over the 2019-20 reporting year. An evaluation of the programme[61] found that there was evidence that scholarships enhanced soft power, including:

  - "Strong evidence that overall alumni have a positive feeling for New Zealand, its people and institutions and embrace New Zealand values"
  - "Some evidence that [the programme] contributes to positive diplomatic perceptions of New Zealand. Alumni, particularly government officials who have undertaken English language training or tertiary scholarships in New Zealand, are effective advocates for New Zealand."

[60] Collins, J. (2012), 'Perspectives from the periphery? Colombo Plan scholars in New Zealand universities, 1951-1975', History of Education Review

[61] Coffey (2019), Strategic Evaluation of New Zealand Aid Scholarships Evaluation Report

The evaluation also concluded that while direct evidence was unavailable, the programme was likely to have contributed to strategic outcomes around partner country development and strengthening country-to-country ties.

- **Immediate contributions to interpersonal networks:** Representatives from New Zealand Trade and Enterprise (NZTE) were focused on goals over a shorter term period. They described international education as a valuable source of interpersonal networks between New Zealand organisations and alumni or other contacts in overseas government and industry, which helped them to initiate discussions in other countries (i.e. a "welcome mat"). International links between academia in New Zealand and other countries, or between ENZ or New Zealand universities and education agencies overseas, have also provided useful lead-ins for contact with diplomatic or trade agencies. This was particularly the case for countries with emerging trade relationships with New Zealand, where education represents a large proportion of the overall value of New Zealand exports to that country. The case study around New Zealand's international education links with Latin America (below) provides an example of how this can occur in practice.

- **Immediate and longer term impacts on perceptions of New Zealand and connections:** A survey of international alumni from New Zealand universities who were living overseas found 73% reported feeling "very much' or 'somewhat' connected to New Zealand (Illuminate Consulting Group, 2009). Another survey from University of Auckland's School of Graduate Studies found that 53% of international doctoral students who left post-study had retained connections with New Zealand, with the most common forms of connection being a research collaboration or a business link, while 21% of those who remained in New Zealand post-study said they had developed relationships with their home countries in their current or previous employment.

- **Quantitative analysis around soft power and international student flows:** Some econometric studies have shown a degree of positive association between soft power rankings and trade, investment and international student flows. International student enrolments are one of several components used to determine soft power rankings (such as Portland PR Ltd's global ranking of soft power or the Lowy Institute's Asia Power Index.)

  For example, one study[62] (Singh and MacDonald, 2017) described the positive correlation between soft power indicators (such as foreign aid and the spread of cultural institutions) with the volume of students, and found a significant association between the spread of cultural institutions and foreign direct investment. Another study[63] (Rose, 2015) found a statistically significant association between increases in a country's soft power rankings and increases in export volumes.

- **Case studies:** While information on alumni post-study outcomes is not typically collected by ENZ or education providers in a systematic fashion, there are anecdotal examples of where alumni have progressed to positions of influence in their home country, sometimes with positive trade or diplomatic outcomes for New Zealand.[64] For example:

  - The evaluation of the New Zealand Scholarships programme provided several examples from alumni interviews, particularly from the Pacific region where a significant proportion of international student alumni have studied in New

[62] Singh and MacDonald, 2017. Soft Power Today: Measuring the Influences and Effects

[63] Rose, A. (2015), Like Me, Buy Me: The Effect of Soft Power on Exports

[64] Education New Zealand (2018), Beyond the economic – How international education delivers broad value for New Zealand.

Zealand. Contributions to partner countries' health and government workforces were highlighted.

- An evaluation of the New Zealand English Language Training for Officials (ELTO) and English Language Training for Senior Officials (ELTSO) programmes over 2009-2013 was commissioned by the Ministry of Foreign Affairs and Trade (MFAT)[65]. Key findings included that the programmes were aligned to enhancing New Zealand's strategic interests, the majority of alumni were working in relevant roles and 44% had since been promoted into more senior positions.

However, quantifying the extent to which international education contributes to soft power (itself an intangible concept) is highly challenging. Shifts in student flows and soft power rankings occur over the long term and alongside a wide range of external factors which can also separately influence student flows and soft power (e.g. shifts in trade, investment and migrant flows; economic and political factors).

4.5.5 Case study: International education's role in New Zealand's bilateral relationships with Latin America

Overview of New Zealand's links with the Latin America region

The Latin America region, in particular Brazil, Chile and Colombia, is a growing export region for New Zealand. While Latin American countries currently account for a relatively small proportion of New Zealand's exports (being outside the top 20 export destinations), the region's population size and economic growth forecasts suggest potential opportunities for New Zealand businesses, education providers and research institutions in the future. NZ Inc's focus for this region is on strengthening bilateral relationships and supporting NZ businesses looking to potentially enter markets in the region.

Strategic focus sectors for NZ Inc agencies such as ENZ and New Zealand Trade & Enterprise (NZTE) include agribusiness, sustainability and technology sectors. New Zealand's farming systems have similarities to areas within the region (particularly parts of Brazil, Chile and Colombia) and "New Zealand is seen as an adopter of best practice in agriculture, [so] there are opportunities for our products and services."[66] Indigenous development is also a key focus for bilateral connections, such as academic and institutional partnerships, knowledge sharing forums and student exchange.

International education's significance to NZ's relationships in the Latin America region

Pre-COVID, the education sector accounted for a substantial proportion of New Zealand's exports to the region (education travel accounted for $250m or 16% of exports to the region in 2019). Education travel was by far the largest export category for Brazil ($126m of exports in the 2019 year) making Brazil the 6th ranked destination for NZ education travel exports[67].

As a result international education has broader significance to the bilateral relationships and partnerships NZ has in the region.

[65] New Zealand Ministry of Foreign Affairs and Trade (2014), Evaluation of the New Zealand English language training for officials and English language training for senior officials programmes 2009-2013.

[66] New Zealand Trade and Enterprise, Chile Market Guide, sourced from https://my.nzte.govt.nz/collection/chile-market-guide/article/intro-to-chile

[67] Stats NZ, New Zealand International Trade Statistics, sourced from https://statisticsnz.shinyapps.io/trade_dashboard

Examples of how international education supports the development of bilateral relations

- **Diplomacy:** Activities undertaken by MFAT often include an education component with ENZ accompanying and/or supporting initiatives.

- **Connections and partnerships:** ENZ contacts with government agencies, universities and other organisations have helped to facilitate other NZ Inc entities such as NZTE, NZ education providers and researchers to form their own connections in the region.
  One recent area which ENZ and NZTE have recently collaborated on is EdTech opportunities for New Zealand companies in the region (e.g. interactive education for school students to support the development of innovative thinking skills).
  In recent years New Zealand universities have developed active formal relationships with five of the top 10 (QS) ranked universities in agricultural and forestry sciences in the region. NZ Inc. agencies such as NZTE and the Ministry for Primary Industries (MPI) have also established relationships with some universities relating to agriculture.

- **Trade links**: Alumni are considered to be useful sources of potential talent for NZ companies entering countries in the Latin America region, being familiar with both local and New Zealand business practices and values.

- **Co-operation around training scholarships and student exchange in conjunction with overseas government agencies and education providers:** such as Manaaki New Zealand Scholarships, Prime Minister's Scholarships for Latin America, Semillero Rural scholarship scheme (Chile), Colfuturo postgraduate scholarship scheme (Colombia) and other student exchange arrangements such as the Winds of Change Network (a sustainable development education programme by the Latin America Centre of Asia-Pacific Excellence led by University of Otago).

- **Collaborative research initiatives** involving researchers from New Zealand and Latin America, such as the Global Research Alliance on Agricultural Greenhouse Gases (GRA), focused on research initiatives in agriculture and sustainability and partially funded and supported by MPI.

- **Alumni:** Former Ambassador to Brazil, Caroline Bilkey, "is able to recount many examples of how positive experiences studying in New Zealand create life-long informal New Zealand ambassadors, who have benefited New Zealand in terms of diplomacy and trade… A very recent example, is that of the successful and well known Brazilian sailor and documentary maker, David Schürmann, whose willingness to promote the New Zealand film industry originates from his 'little New Zealand sister' and the time he spent at school here." [68]

  Another example of alumni who have contributed to ongoing links between New Zealand and Brazil is Airton Spies, who in his previous role as Secretary of Agriculture and Fisheries for Santa Catarina drew on his postgraduate education in farm management from New Zealand. He now leads his own consultancy advising Brazilian agriculture specialists in evolving trends and has organised multiple technical tours of farmers, agribusiness managers and governmental heads to New Zealand farms, drawing on Airton's long established connections with the country[69].

[68] Education New Zealand (2018), Beyond the economic – How international education delivers broad value for New Zealand.

[69] Sourced from https://farmersweekly.co.nz/s/fw-article/brazil-looks-to-nz-to-improve-farming-practices-MCWFHN3MTATZCQPAVIWWZXHDCTXI and https://newlook.enz.govt.nz/category/people-and-culture/new-zealand-study-experience-helps-transform-brazilian-agribusiness/

5. Economic impacts realised annually

International education's immediate-term contribution to GDP output is unlikely to return to pre-pandemic levels until 2030 without significant investment in a sustainable and resilient sector. By 2030, a 'conservative' recovery would contribute $3.8bn (increase of $0.1bn from 2019) while a 'neutral' or 'optimistic' recovery would contribute $4.2bn (increase of $0.5bn from 2019).

5.1 Summary

5.1.1 Number of learners by country of origin

Prior to the pandemic, China and India accounted for just under half of international student enrolments (47% of onshore learners in 2019). Other Asian countries accounted for a further 30% of enrolments, with a smaller proportion of enrolments coming from Europe (9%) and the Americas (5%).

Border closures are expected to have had a greater impact on student counts for countries where longer duration university courses represent a smaller proportion of enrolments. For example, onshore learners from Japan are expected to have decreased by nearly 90% as school and ELS enrolments represent the majority of enrolments.

Table 22: Variance in onshore international learner enrolments, by country of origin, in 2019 compared with projected 2022 enrolments

	2019	2022 estimated[70]	Variance
Onshore			
China	37,368	14,625	-61%
India	17,331	6,742	-61%
Japan	10,466	1,360	-87%
South Korea	6,196	1,458	-76%
Brazil	3,008	1,783	-41%
Thailand	3,268	473	-86%
Viet Nam	3,211	709	-78%
USA	3,040	1,023	-66%
Germany	2,797	652	-77%
Philippines	2,461	1,009	-59%
France	1,902	290	-85%
Malaysia	1,831	1,102	-40%
Saudi Arabia	1,576	374	-76%
Other	21,258	7,240	-66%
Grand Total	115,713	38,840	-66%

[70] These numbers are estimated based off the projected international learners for 2022 and the average distribution of country of origin of international learners between 2017 and 2019 by subsector.

5.1.2 Total annual benefits realised

Immediate-term economic impacts from onshore international learners are projected to gradually recover in line with student enrolments, with a return to pre-pandemic levels by 2028 (under an 'optimistic' recovery), 2029 (under a 'neutral' recovery) or 2030 (under a 'conservative' recovery).

In contrast, longer term impacts from international learners who contribute to New Zealand's labour supply, skilled human capital and research sector within 10 years of leaving study are subject to the accumulated effect of 3-6 years of minimal or reduced intake. The yearly value of labour supply economic impacts is projected to decrease by up to $1,010m (under an 'optimistic' recovery) to $2,470m (under a 'conservative' recovery) between 2022 and 2030, with a return to pre-pandemic levels not expected until after 2030.

The tables below summarise the projected changes to yearly economic impacts under various recovery scenarios.

Table 23: Variance in monetised benefits realised in the immediate and longer term in 2019 compared with 2022 and 2030

GDP output over year ($m)	2019	2022	2030	Variance from 2019 to 2030[71]	Variance during pandemic period (2019 to 2022)	Variance post pandemic period (2022 to 2030)[71]
Benefits realised in the immediate-term	3,700	790	3,780 to 4,200	80 to 500	-2,910	3,040 to 3,360
Benefits realised in the longer-term	Up to 5,870	Up to 6,090	Up to 3,610 to 5,070	-1,100 to -2,690*	220	-1,320 to -2,900*

** Note: Variance from 2019-30 and 2022-30 includes the impact of reduced education-based R&D and human capital. Baseline values for GDP output from all education-based R&D and human capital were not available.*

[71] The timeframe over which variations are expected to impact GDP output depends on the impact type. For labour supply and productivity, variations in 2030 are expected to be realised in that same year. For education-based R&D and human capital, variations in 2030 are expected to be realised over a longer term period (e.g. 2030-40).

Table 24: Variance in immediate and longer term benefits between 2022 and 2030

GDP output over year ($m)	2022	2030	Variance post pandemic period (2022 to 2030)[71]
Benefits realised in the immediate-term			
Fees and expenditure	510	3,240 to 3,530	2,740 to 3,020
Visiting family and friends	45	310 to 340	270 to 290
Education and training exports	240	230 to 350	35 to 55
Non-monetised impacts			
Cross subsidisation of teaching and research			
Outbound domestic students			
Broader impacts for Māori			
Housing and infrastructure impacts of learners while studying			
Total – Immediate-term impacts	**790**	**3,780 to 4,200**	**3,040 to 3,360**
Benefits realised in the longer-term			
Labour supply and productivity	Up to 6,090	Up to 3,610 to 5,070	-1,010 to -2,470
Education based research and development	n/a – analysis relates to impact of variations only		-120 to -160
Human capital and tertiary education attainment	n/a – analysis relates to impact of variations only		-180 to -270
Non-monetised impacts			
Global competence and intercultural connections			
Housing and infrastructure impacts of learners post study			
International research collaboration and mobility			
Bilateral trade relationships			
Soft power in diplomacy, trade, and NZ Brand			
Total – Longer-term impacts	**Up to 6,090**	**Up to 3,610 to 5,070**	**-1,320 to -2,900**

5.2 Recovery Scenario 1: Conservative

The 'conservative' recovery describes a scenario where there are considerable constraints on new international learner entries that gradually ease over 2022-25 (e.g. due to delays in student visa approvals). Enrolments continue to gradually increase from 2026 up to a maximum of 75% of pre-pandemic student entries by 2030.

Compared to other scenarios, immediate-term economic impacts take longer to return to pre-pandemic levels. Longer term impacts from labour supply contributions decrease to 62% of pre-pandemic levels by 2030.

Under this scenario university learners represent a higher proportion of new entries relative to pre-pandemic years, reflecting a faster recovery relative to other education provider subsectors. As a result the larger economic regions with universities (Auckland, Canterbury and Wellington) are expected to recover faster over 2022-30 than other regions which are smaller or have a greater reliance on other education subsectors.

5.2.1 Projected economic benefits by year

Figure 7: Immediate monetised economic impacts per year under a 'conservative' recovery scenario up to 2030

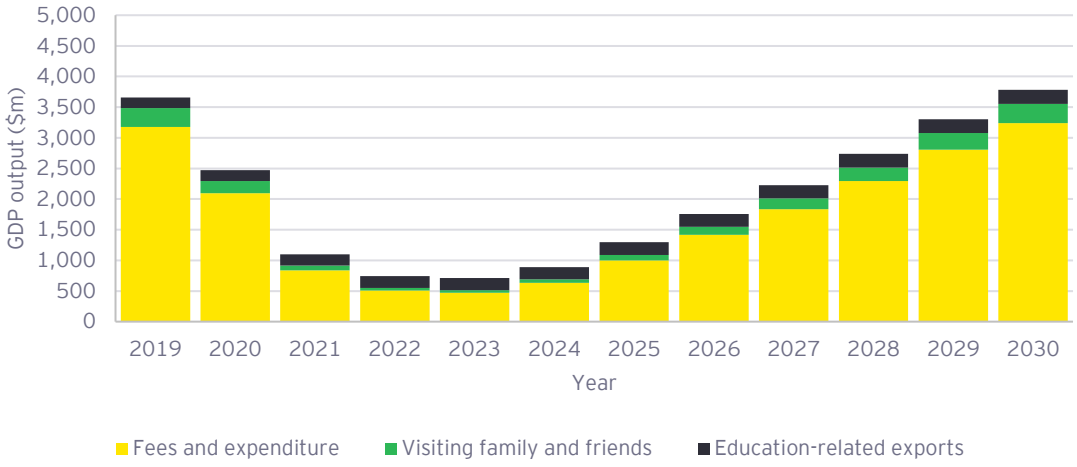
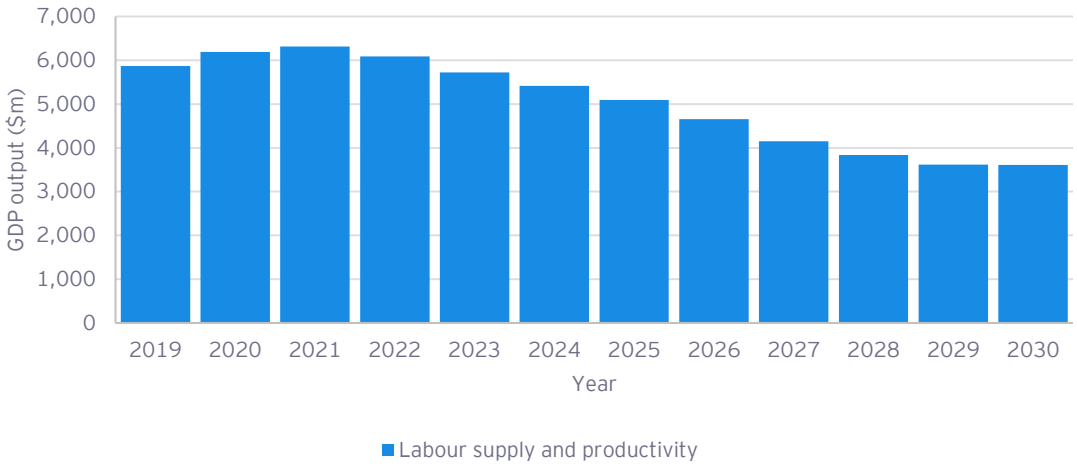


Figure 8: Longer term monetised economic impacts per year under a 'conservative' recovery scenario up to 2030



5.2.2 Economic benefits over recovery period

Table 25: Variance in immediate and longer-term benefits realised in 2022 compared with a 'conservative' recovery by 2030

GDP output over year ($m)	2022	2030	Variance post pandemic period (2022 to 2030)[71]
Benefits realised in the immediate-term			
Fees and expenditure	510	3,240	2,740
Visiting family and friends	45	310	270
Education and training exports	190	230	35
Non-monetised impacts			
Cross subsidisation of teaching and research			
Outbound domestic students			
Broader impacts for Māori			
Housing and infrastructure impacts of learners while studying			
Total – Immediate-term impacts	750	3,780	3,040
Benefits realised in the longer-term			
Labour supply and productivity	Up to 6,090	Up to 3,610	-2,470
Education based research and development	n/a – analysis relates to impact of variations only		-160
Human capital and tertiary education attainment	n/a – analysis relates to impact of variations only		-270
Non-monetised impacts			
Global competence and intercultural connections			
Housing and infrastructure impacts of learners post study			
International research collaboration and mobility			
Bilateral trade relationships			
Soft power in diplomacy, trade, and NZ Brand			
Total – Longer term impacts	Up to **6,090**	Up to **3,610**	**-2,900**

5.2.3 Immediate-term economic benefits over recovery period, by region

Table 26: Variance in total benefits realised in 2022 compared with a 'conservative' recovery by 2030, by region

GDP output over year ($m)	2022	2030	Variance post pandemic period (2022 to 2030)[71]
Within New Zealand			
Auckland	360	2,330	1,980
Wellington	100	550	450
Canterbury	55	320	270
Waikato	15	80	65
Bay of Plenty	5	85	75
Otago	40	220	180
Northland	-5	-25	-20
Gisborne	<5	<5	<5
Hawke's Bay	-10	-35	-25
Taranaki	<5	-15	-15
Manawatu-Wanganui	<5	15	15
West Coast	<5	<5	<5
Southland	<5	10	10
Tasman	<5	<5	<5
Nelson	<5	15	10
Marlborough	<5	<5	<5
Subtotal	**550**	**3,550**	**3,000**
Outside New Zealand or not segmented by region			
Education and training exports	190	230	35
Grand Total	**750**	**3,780**	**3,040**

Notes:

- *All estimates are rounded to the nearest $5m or $10m.*
- *Regions with a relatively small number of international learner enrolments are expected to have smaller or negative immediate-term economic impacts, reflecting some degree of re-allocation of economic resources to regions with a larger economic injection from student tuition fees and expenditure.*

5.3 Recovery Scenario 2: Neutral

The 'neutral' recovery scenario involves constraints on new international learner entries that gradually ease over 2022-23 (e.g. due to delays in student visa approvals). Enrolments gradually increase from 2024 up to a maximum of 75% of pre-pandemic student entries by 2027, with new student entries remaining the same in each subsequent year.

University learners represent a higher proportion of new entries relative to pre-pandemic years, while other subsectors experience a larger increase in enrolments than under the 'conservative' scenario. As a result the larger economic regions with universities (Auckland, Canterbury and Wellington) are expected to recover faster over 2022-30. Other regions are not expected to return to pre-pandemic economic impact levels before 2030 although their recovery is faster than under the 'conservative' scenario.

5.3.1 Projected economic benefits by year

Figure 9: Immediate-term monetised economic impacts per year under a 'neutral' recovery scenario up to 2030

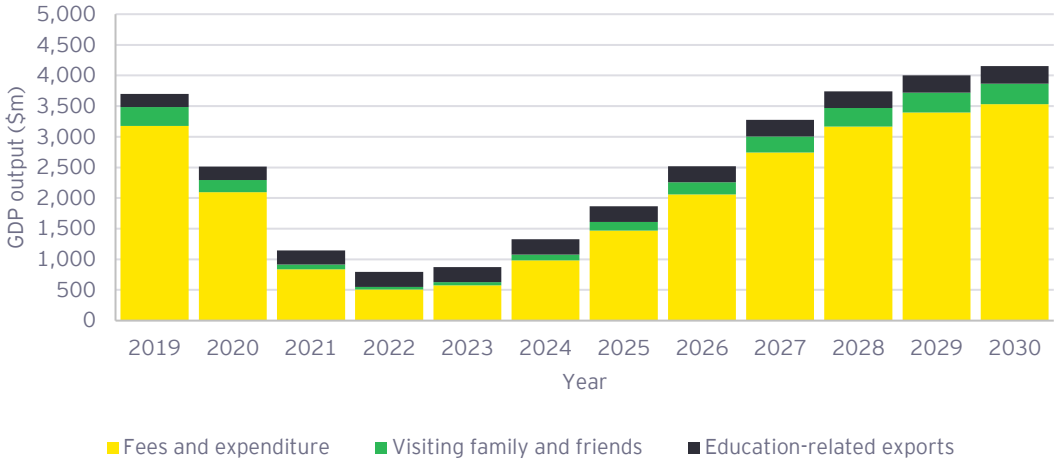
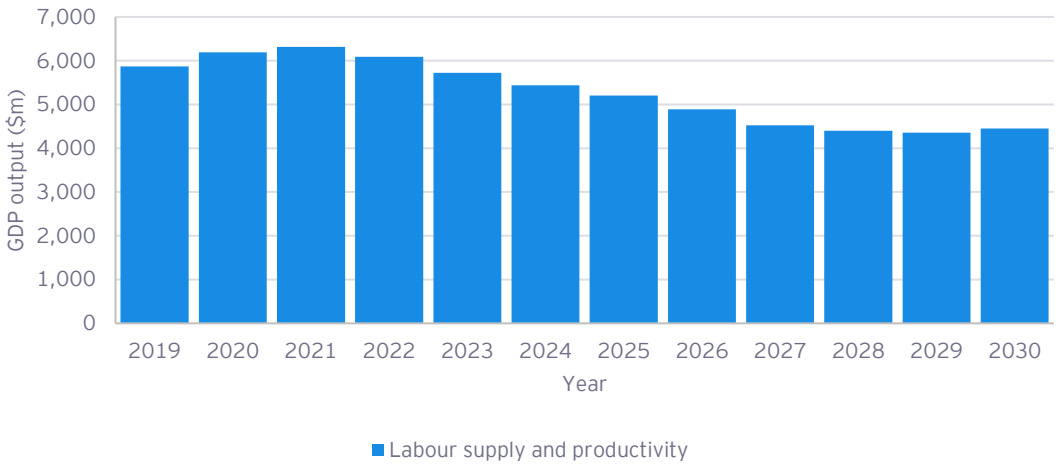


Figure 10: Longer-term monetised economic impacts per year under a 'neutral' recovery scenario up to 2030



5.3.2 Economic benefits over recovery period

Table 27: Variance in immediate and longer-term benefits realised in 2022 compared with a 'neutral' recovery by 2030

GDP output over year ($m)	2022	2030	Variance post pandemic period (2022 to 2030)[71]
Benefits realised in the immediate-term			
Fees and expenditure	510	3,530	3,020
Visiting family and friends	45	340	290
Education and training exports	240	290	45
Non-monetised impacts			
Cross subsidisation of teaching and research			
Outbound domestic students			
Broader impacts for Māori			
Housing and infrastructure impacts of learners while studying			
Total – Immediate-term impacts	**790**	**4,150**	**3,360**
Benefits realised in the longer-term			
Labour supply and productivity	Up to 6,090	Up to 4,450	-1,630
Education based research and development	n/a – analysis relates to impact of variations only		-130
Human capital and tertiary education attainment	n/a – analysis relates to impact of variations only		-220
Non-monetised impacts			
Global competence and intercultural connections			
Housing and infrastructure impacts of learners post study			
International research collaboration and mobility			
Bilateral trade relationships			
Soft power in diplomacy, trade, and NZ Brand			
Total - Longer-term impacts	**Up to 6,090**	**Up to 4,450**	**-1,990**

5.3.3 Immediate-term economic benefits over recovery period, by region

Table 28: Variance in total benefits realised in 2022 compared with a 'neutral' recovery by 2030, by region

GDP output over year ($m)	2022	2030	Variance post pandemic period (2022 to 2030)[71]
Within New Zealand			
Auckland	360	2,550	2,190
Wellington	100	600	500
Canterbury	55	350	300
Waikato	15	85	70
Bay of Plenty	5	90	80
Otago	40	240	200
Northland	-5	-30	-25
Gisborne	<5	<5	<5
Hawke's Bay	-10	-40	-30
Taranaki	<5	-20	-15
Manawatu-Wanganui	<5	15	15
West Coast	<5	<5	<5
Southland	<5	10	10
Tasman	<5	<5	<5
Nelson	<5	15	10
Marlborough	<5	<5	<5
Subtotal	**550**	**3,870**	**3,320**
Outside New Zealand or not segmented by region			
Education and training exports	240	290	45
Grand Total	**790**	**4,150**	**3,360**

Notes:

- *All estimates are rounded to the nearest $5m or $10m.*
- *Regions with a relatively small number of international learner enrolments are expected to have smaller or negative immediate-term economic impacts, reflecting some degree of re-allocation of economic resources to regions with a larger economic injection from student tuition fees and expenditure.*

5.4 Recovery Scenario 3: Optimistic

Under an 'optimistic' recovery, constraints on new international learner entries are eased after 2022 with enrolments increasing from 2023 onwards up to a maximum of 75% of pre-pandemic student entries by 2026. New student entries remain the same in each subsequent year. University learners represent a higher proportion of new entries relative to pre-pandemic years, while other subsector enrolments recover faster than under the 'neutral' scenario.

Compared to other scenarios, immediate-term economic impacts return to pre-pandemic levels at an earlier stage, with the majority of regions expected to recover to pre-pandemic immediate-term economic impact levels at or before 2030.

5.4.1 Projected economic benefits by year

Figure 11: Immediate-term monetised economic impacts per year under an 'optimistic' recovery scenario up to 2030

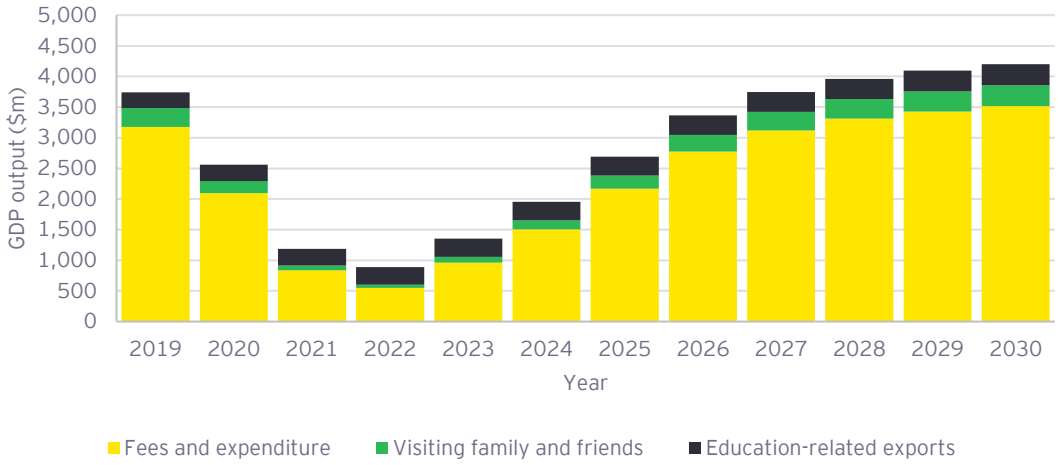
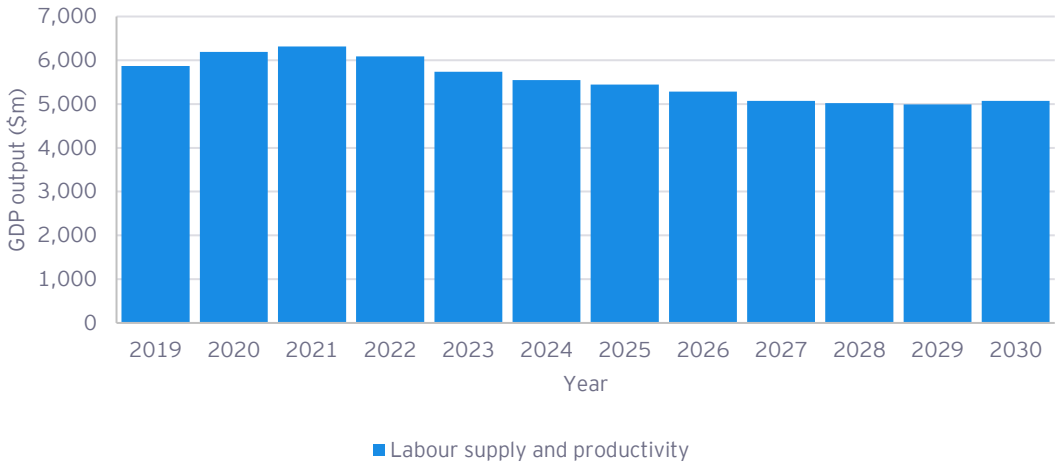


Figure 12: Longer-term monetised economic impacts per year under an 'optimistic' recovery scenario up to 2030



5.4.2 Economic benefits over recovery period

Table 29: Variance in immediate and longer-term benefits realised in 2022 compared with an 'optimistic' recovery by 2030

GDP output over year ($m)	2022	2030	Variance post pandemic period (2022 to 2030)[71]
Benefits realised in the immediate-term			
Fees and expenditure	510	3,520	3,010
Visiting family and friends	45	340	290
Education and training exports	290	350	55
Non-monetised impacts			
Cross subsidisation of teaching and research			
Outbound domestic students			
Broader impacts for Māori			
Housing and infrastructure impacts of learners while studying			
Total – Immediate-term impacts	**840**	**4,200**	**3,360**
Benefits realised in the longer-term			
Labour supply and productivity	Up to 6,090	Up to 5,070	-1,010
Education based research and development	n/a – analysis relates to impact of variations only		-120
Human capital and tertiary education attainment	n/a – analysis relates to impact of variations only		-180
Non-monetised impacts			
Global competence and intercultural connections			
Housing and infrastructure impacts of learners post study			
International research collaboration and mobility			
Bilateral trade relationships			
Soft power in diplomacy, trade, and NZ Brand			
Total – Longer-term impacts	**Up to 6,090**	**Up to 5,070**	**-1,320**

5.4.3 Immediate-term economic benefits over recovery period, by region

Table 30: Variance in total benefits realised in 2022 compared with an 'optimistic' recovery by 2030, by region

GDP output over year ($m)	2022	2030	Variance post pandemic period (2022 to 2030)[71]
Within New Zealand			
Auckland	360	2,560	2,210
Wellington	100	590	490
Canterbury	55	350	290
Waikato	15	80	65
Bay of Plenty	5	90	85
Otago	40	240	200
Northland	-5	-30	-25
Gisborne	<5	<5	<5
Hawke's Bay	-10	-40	-30
Taranaki	<5	-20	-15
Manawatu-Wanganui	<5	10	10
West Coast	<5	<5	<5
Southland	<5	10	10
Tasman	<5	<5	<5
Nelson	<5	10	10
Marlborough	<5	<5	<5
Subtotal	**550**	**3,850**	**3,300**
Outside New Zealand or not segmented by region			
Education and training exports	290	350	55
Grand Total	**840**	**4,200**	**3,360**

Notes:

- *All estimates are rounded to the nearest $5m or $10m.*
- *Regions with a relatively small number of international learner enrolments are expected to have smaller or negative immediate-term economic impacts, reflecting some degree of re-allocation of economic resources to regions with a larger economic injection from student tuition fees and expenditure.*

6. Modelling considerations and limitations

Note as at August 2022: *The model findings set out in this report are based on a number of assumptions informed by pre-pandemic experience and ENZ's internal forecasts around future student enrolments as at January 2022. Since then, material events have occurred which affect these assumptions, forecasts and therefore the projected economic impacts. These events include changes to post-study visa settings and border re-opening dates. These impacts are not reflected in this report.*

Given the uncertainty around future student enrolments, the impact of changes to immigration system and other policy settings, domestic and global economic conditions and other factors affecting the valuation in 2022 and beyond, it is recommended that ENZ revisit its recovery scenario forecasts at some point in the future to understand the emerging impacts on New Zealand's international education sector.

The following assumptions significantly influence economic value estimates and require scrutiny:

- Future student enrolments and education provider subsector profile under post-COVID recovery settings.
- Assumptions around the proportion of future learners who transition into the workforce is based on recent (3 years) historic experience pre-pandemic. Post pandemic and with other policy and/or system changes, this pattern may be different from what is projected under the scenarios described in this report.
- Impact of New Zealand-trained skilled migrants on the domestic workforce, including wages and any displacement effects, and the extent to which NZ-trained skilled migrants impact productivity across different sectors and skill levels.
- Overlap between the contribution of international education and that of broader migration to impacts on labour supply – some of this economic value is attributable to migration, as it is likely that there is some degree of substitution occurring for international migrants educated outside New Zealand.

A key caveat is that all modelling estimates in this report are subject to degrees of uncertainty, with greater degrees of uncertainty associated with projections further out into the future and/or based on limited data.

7. Data limitations and future opportunities

This section summarises areas of limited or unavailable data where future improvements in the information collected by ENZ or other agencies could potentially enhance understanding of broader impacts.

Valuation component	Potential impact	Potential future enhancements to data collection
Economic impacts	**Student fees and expenditure**	As noted in the December 2019 review of previous valuations – expanding the sample of international student surveys (after onshore students return post COVID-19) will support greater reliability in findings from cohorts outside the higher education sector.
	Education and training goods exports	A new run of the education & training exporter survey used in previous valuations will support a refresh to reflect post COVID-19 market conditions. Additional data collections are likely to be required to support potential future revisions to the definition of activities included in this item. An example is the research currently underway in the sector to better understand the scale and nature of New Zealand's education technology exports, which may not be fully captured by previous valuation estimates.
	Cross-subsidisation of teaching and research activities	Information on the profile and extent to which domestic courses and research projects are supported by international education revenue (e.g. number of domestic enrolments supported, profile by field of study) would support quantitative analysis around this impact.
Social and international impacts	Information sources which would enhance understanding around the nature and extent of social and international impacts include:	
	Cultural diversity and connections	▸ Expanded surveys of onshore international students with questions exploring the extent to which they connect with their local community in different ways, e.g. volunteering, sport and other social activities, in-study work. ▸ Surveys of local communities in areas with education providers that have substantial international education enrolments, around the extent to which they have contact with international students and their perceptions around the impacts they have on the community.
	Infrastructure, health and social services	▸ Expanding existing surveys of onshore international students to include questions around transport usage, accommodation and contact with student support services.
	Broader impacts for Māori	▸ Information around in-study experiences and post-study outcomes reported by Māori alumni of formal overseas scholarship or exchange programs
	Global competence and other outcomes for outbound students returning to NZ	▸ Surveys of NZ students who have returned from overseas scholarships, exchange programs or other formal study arrangements, covering their experiences and outcomes from overseas study

Appendix A Reliances, limitations and disclaimer

Our final report has been provided to Education NZ pursuant to the terms of our engagement dated 30 June 2021 and should not be used or relied on for any other purpose or distributed to any other party without Ernst & Young's prior written consent.

This report may only be provided to Education NZ (the Client). However, any other party other than the Client who access this report shall only do so for their general information only and this report should not be taken as providing specific advice to those parties on any issue, nor may this report be relied upon in any way by any party other than the Client. A party other than the Client accessing this report should exercise its own skill and care with respect to use of this report, and obtain independent advice on any specific issues concerning it.

In carrying out our work and preparing this report, Ernst & Young has worked solely on the instructions of the Client, and has not taken into account the interests of any party other than the Client. The report has been constructed based on information current as of 14 February 2022 which has been provided by the Client. As of 29 November 2022, material events have occurred which are not reflected in the modelling results described in this report, including changes to immigration system settings and border re-opening dates. Other material events may have occurred since completion which are not reflected in this report.

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Stats NZ IDI Disclaimer

Access to the data used in this study was provided by Stats NZ under conditions designed to give effect to the security and confidentiality provisions of the Statistics Act 1975. The results presented in this study are the work of the author, not Stats NZ or individual data suppliers.

These results are not official statistics. They have been created for research purposes from the Integrated Data Infrastructure (IDI) which is carefully managed by Stats NZ. For more information about the IDI please visit https://www.stats.govt.nz/integrated-data/.

The results are based in part on tax data supplied by Inland Revenue to Stats NZ under the Tax Administration Act 1994 for statistical purposes. Any discussion of data limitations or weaknesses is in the context of using the IDI for statistical purposes, and is not related to the data's ability to support Inland Revenue's core operational requirements.

Appendix B Detailed approach for inputs to CGE modelling

Recovery scenarios

Three potential 'post-COVID' recovery scenarios were developed with ENZ, based on different assumptions around the timing and volume of international students returning to onshore study in New Zealand. These scenarios are summarised below.

Table 31: Post COVID-19 recovery scenarios

Projection	Scenario One (optimistic)	Scenario Two (neutral)	Scenario Three (conservative)
	Government starts allowing entry from low and medium risk countries in 2022, with visa processing allowing for onshore enrolments for at least one semester in 2022	**Government exception classes remain in place until 2024, with limited approval of visa applications in 2022-2023**	**Government exception classes remain in place until 2026, with limited approval of visa applications in 2022-2025**
2021	1,250 students (250 PHDs and 1,000 Degrees)	1,250 students (250 PHDs and 1,000 Degrees)	1,250 students (250 PHDs and 1,000 Degrees)
2022	6,890 students (10% of historic arrivals)	5,000 students	5,000 students
2023	27,550 students (40% of historic arrivals)	13,670 students	10,250 students
2024	34,440 students (50% of historic arrivals)	23,920 students (35% of historic arrivals)	13,670 students
2025	44,770 students (65% of historic arrivals)	30,750 students (45% of historic arrivals)	20,500 students
2026	51,660 students (75% of historic arrivals)	41,000 students (60% of historic arrivals)	27,340 students (40% of historic arrivals)
2027	Same as for 2026	51,660 students (75% of historic arrivals)	34,170 students (50% of historic arrivals)
2028	Same as for 2026	Same as for 2027	41,000 students (60% of historic arrivals)
2029	Same as for 2026	Same as for 2027	47,840 students (70% of historic arrivals)
2030	Same as for 2026	Same as for 2027	51,260 students (75% of historic arrivals)

The different scenarios describe varying points at which New Zealand allows entry from the majority of overseas countries that students come from, and when visa processing and approvals allow for the commencement of onshore learners. The scenarios also describe different speeds of recovery based on offshore factors (such as competitor behaviour, logistical capability, appetite for onshore enrolments, travel costs and other external factors).

- The projected number of new students shown in coloured boxes are based on assumed constraints on new students entering the country in a restricted entry period.
- The projected number of new students shown in white boxes come from applying different estimated recovery rates to the historic number of students who entered the country each year. Over 2016-19 the average number of students entering the country was about 68,000 per year (based on Statistics New Zealand data).

- Estimated recovery rates reflect assumed student retention rates by sub-sector from the current year to the following year.

- Other assumptions varying in each scenario include the proportion of new students in each year allocated to each education provider subsector.

Fees, expenditure and visiting family and friends tourism spend

For input to the CGE model, net expenditure on student fees, living costs, student tourism and tourism spend of visiting family and friends was estimated for each year 2019-2030, split by region and economic sector. Net spend was estimated under four scenarios, a 'no COVID' scenario where COVID-19 is assumed to have never happened, and the three 'post-COVID' recovery scenarios described in the previous section. The only difference between these scenarios is the projected enrolment numbers and education provider subsector profile; all other assumptions are held the same.

Total net spend is defined as:

1. International student tuition fees
2. – commissions paid to overseas agents
3. – MOE student levy
4. + International student expenditure on living costs, tourism and other activities
5. – deductions for the expenditure of domestic students while on overseas exchange
6. + tourism expenditure from visiting family and friends
7. – International student earnings from working while studying

The following table describes the inputs and assumptions used to estimate each component over each projection year 2019-30. All dollar amounts are indexed for inflation at a rate of 2% p.a.. All fee and expenditure amounts exclude GST.

Table 32: Immediate-term economic impact components, inputs and assumptions

Spend components	Inputs	Assumptions	Source
1. Average tuition fee per student by education provider subsector	Tuition fee income to providers from international fee-paying students, 2019	Tuition fee income to non-government funded providers split between unfunded PTE and ELS categories using the respective fee relativities reported in the 2018 student expenditure survey.	Ministry of Education, Export Education Levy: Full-year statistics 2020
	Tuition fee income to universities from domestic fee-paying international doctorate students, 2019	Assumed to be equal to the average domestic fee across all domestic students. Includes revenue under domestic student tuition fees, compulsory student charges and levies, and fees free funding categories.	Consolidated audited financial results from the 2019 Office of the Auditor General Tertiary education institutions audit
	Tuition fee income in respect of NZ Aid scholarship students and	Assumed to be zero.	n/a

Spend components	Inputs	Assumptions	Source
	overseas exchange students		
2. Average overseas agent commissions per student	Overseas agent commissions as a percentage of tuition fees by education provider subsector, average over 2017-19	Commissions are assumed to be the same proportion of tuition fee income for PTEs and ELS as for ITPs. Commission rates for primary and secondary school students are assumed to be midway between university and ITP commission rates.	Tuition fees and overseas agent commissions for the university and ITP subsectors over 2013-19 were sourced from the Tertiary Education Commission. Sample of documents from individual secondary schools specifying the commission rates paid to overseas recruitment agencies, sourced from a scan of information made available by schools on the internet.
3. Average Ministry of Education levies per student	Export education levy (EEL) rates for international fee-paying students, 2019 International student levy (ISL) rates for international school students, 2020	ISL, primary schools - $10.73 per school week in 2020 (40 school weeks over the year) ISL, secondary schools - $11.00 per school week in 2020 (40 school weeks over the year) EEL (universities, ITPs and wānanga) - 0.50% of tuition fees EEL (PTE and ELS) – 0.89% of tuition fees Note that EEL collections were suspended in 2020-21 during the pandemic period. It is assumed that levies will resume from 2022 onwards with inflation adjustments of 2% p.a. to ISL from 2020 levels.	Export Education Levy 2019 and International Student Levy 2020 rates, Ministry of Education
4. Average expenditure on living costs and tourism per student	Average student living costs and tourism spend by education provider subsector, 2018	Average expenditure for wānanga students is assumed to be the same as ITP students.	Economic Valuation of International Education in NZ 2018, Education New Zealand
5. Deductions for the expenditure of domestic	Domestic exchange student adjustment factor for university and secondary school	The number of domestic students who undertake exchange is around half the number of international	Strategas Consulting (2021), Review of Economic Valuations of New Zealand's

Spend components	Inputs	Assumptions	Source
students on overseas exchange	subsectors, expressed as a percentage of international students	exchange students who come to New Zealand. This equates to approximately 2.5% of international student enrolments at universities and 2% of international student enrolments at secondary schools.	International Education Sector. OECD (2021), Education at a Glance 2021: OECD Indicators.
	Domestic exchange student living cost and tourism	The average living cost and tourism spend of domestic students while overseas is assumed to be the same as for onshore international students within the same education subsector.	n/a
6. Visiting family and friends tourism expenditure per student	Average expenditure amount per international visitor	Expenditure by family and friends visiting international students is the same as for other international tourists whose purpose is 'visiting friends/relatives' ($2,294)	Stats NZ and MBIE, International Visitor Survey December 2019
	Proportion of international students who have visiting family/friends in a year	40%	Survey on visiting friends and relatives, results contained in Economic Valuation of International Education in NZ 2018, Education New Zealand
	Average number of visitors per student with visiting family/friends	3	Survey on visiting friends and relatives, results contained in Economic Valuation of International Education in NZ 2018, Education New Zealand
7. Deductions for student earnings from employment while studying	Proportion of international students working while in-study over 2017-19, by education provider subsector Average annual earnings per international student working while in-study over 2017-19, by education provider subsector	Average employment rates and earnings for unfunded PTE students are assumed to be the same as for funded PTE students. No employment earnings are assumed for school, university exchange or NZ Aid scholarship students.	Analysis findings around employment rates and earnings for working international students in administrative data. Sourced from Universities New Zealand (2021), Working while studying. Additional analysis of employment rates and earnings for ELS students in administrative data was undertaken by EY.

Spend components	Inputs	Assumptions	Source
	Student earnings inflation	2% p.a. (same as inflation rate applied to fees and expenditure amounts)	n/a

For the 'no COVID' scenario, projected enrolments for 2020-2030 for each education provider were estimated using 2019 enrolment numbers combined with a constant assumed growth rate. The following table details these growth rate assumptions, which were based on analysis of enrolment trends over the 10 years to 2019. (Projected enrolment numbers under other scenarios were based on estimates from ENZ.)

Table 33: Student enrolment growth assumptions for the 'no COVID' scenario

Education provider subsector	Growth assumption	Details
Primary schools	0.0%	Assume remain at 2019 levels
Secondary schools	3.0%	Assume growth at the same levels as observed over the two years to 2019.
ELS	0.0%	Assume remain at 2019 levels
PTE	0.0%	Assume remain at 2019 levels (Noting that there was significant volatility in unfunded PTE enrolments over 2014-18 which was not expected to continue into the future.)
ITPs	0.0%	Assume remain at 2019 levels (Noting that there was significant uncertainty around future enrolment directions even prior to the pandemic with the establishment of Te Pūkenga and vocational education reforms.)
University	4.1%	Assume growth at the same levels as observed over the ten years to 2019. (Noting that larger increases over 2014-19 were assumed to decrease to longer term growth rates.)
Wānanga	0.0%	Assume remain at 2019 levels

The 2019-2030 spend for each component is allocated to economic sectors and regions using the following assumptions.

Table 34: Immediate-term economic impact regional and economic sector distributions

Spend components	Assumptions	Details
Tuition fees	Regional profile	Based on the 2017-19 average regional profile of international student enrolments by education provider subsector. Sourced from Ministry of Education student counts data.

Spend components	Assumptions	Details
	Economic sector profile	All fee revenue is allocated to the 'Education and Training' sector
Student expenditure, non-tourism	Regional profile	Based on the 2017-19 average regional profile of international student enrolments by education provider subsector. Sourced from Ministry of Education student counts data.
	Economic sector profile	Based on estimates of non-tuition expenditure split by category from the 2018 student expenditure survey
Student expenditure, tourism	Regional profile	All student tourism spend is assumed to be allocated outside the region of enrolment, and is pro-rated to each region based on the average regional distribution of international visitor spending over 2017-19. Sourced from the Ministry of Business, Innovation & Employment's Monthly Regional Tourism Estimates statistics.
	Economic sector profile	Based on estimates of student tourism expenditure split by category from the 2018 student expenditure survey
Visiting friends and family tourism expenditure	Regional profile	70% of visiting family and friends tourism expenditure is allocated to student enrolment regions. 30% of visiting family and friends tourism expenditure is allocated outside the region of enrolment, and is pro-rated to each region based on the average regional distribution of international visitor spending over 2017-19. Sourced from the Ministry of Business, Innovation & Employment's Monthly Regional Tourism Estimates statistics.
	Economic sector profile	Based on estimates of student tourism expenditure split by category from the 2018 student expenditure survey
Earnings from working while studying	Regional profile	Based on the 2017-19 average regional profile of international student enrolments by education provider subsector. Sourced from Ministry of Education student counts data.
	Economic sector profile	Based on the employment sector profile reported by students working while studying from the 2018 Census. Sourced from Universities New Zealand (2021), Working while studying. Unfunded PTE and ELS students are assumed to have the same employment sector profile as funded PTE students.

Education and training exports

As described in section 3.2.3, the ENZ survey of exporters of education and training goods and services was the main information source for previous education export valuations, as there is no direct alignment between the export categories in Stats NZ's trade statistics and the definition of education exports used for valuations. An updated run of this survey was not available for the 2021 valuation; it is expected that COVID-19 has impacted exports, and it is as yet unclear what the impact of post-COVID conditions on exports will be. As a result, education export earnings for 2019-

2030 were estimated using the earnings and exporters' future growth forecasts from the 2018 survey[72] as a basis.

The total export revenue from New Zealand-based operations of $179.7m in 2017 (excluding profits from offshore operations) was combined with respondents' export earnings expectations for the next three years to estimate a range for 2021 export earnings. Findings from the exporter survey included:

- Percentage of organisations in 2017 that expect education export earnings to increase, decrease, or stay the same over the next three years
- Percentage of organisations in 2017 that expect earnings to increase, and by how much (category range)

The proportion of respondents who thought earnings would increase (decrease / stay the same) in three years' time was combined with the distribution of responses around the size of the earnings increase (decrease) to determine estimated upper and lower bounds for 2021 export earnings.

Assumptions included:

- All responses were given the same weighting as no information was available in relation to the size or earnings of each firm's response
- Upper and lower bounds for each category were used to determine the 2021 earnings range
- The earnings profile for respondents who answered 'Don't know' was assumed to be the same as other respondents
- For the proportion of respondents who expected a decrease in earnings, the distribution of decreases was assumed to be the same as that of earnings increases

Export earnings for each year over 2019 to 2030 were then estimated using the mid-point of the estimated 2021 export earnings range, indexed by inflation using 2021 as the base year.

Future export earnings are likely to move independently from other earnings streams that are tied to the timing and volume of international students returning to onshore study. As a result, basic sensitivity analysis was applied for export earnings under a 'conservative' or 'optimistic' recovery scenario. These scenarios assume export revenue in 2022 onwards varies by -20% (conservative) or +20% (optimistic) from the base 'neutral' scenario described above.

The GDP output and indirect employment associated with export earnings under each scenario was then estimated using CGE model output from onshore student expenditure.

Labour supply and productivity

For input to the CGE model, the following components were estimated for each year 2019-2030:

- The employment FTE in each year from international learners who left study within the preceding 10 years, remained in New Zealand and who were employed for some/all of the year
- The employment FTE in each year from international learners working while studying

These inputs were used as a "shock" to the baseline CGE model, whereby the difference in economic output and wages after their removal from the workforce is used as an estimate of the economic

[72] PwC (2018). The value of New Zealand's education exports 2018.

impact attributable to their workforce contributions. All inputs were segmented by employment sector and occupation category.

Employment FTE was estimated under four scenarios, a 'no COVID' scenario where COVID-19 is assumed to have never happened, and three 'post-COVID' scenarios which consist of varying projections for onshore international student enrolments over 2022 to 2030. The only difference between these scenarios is the projected enrolment numbers and education provider subsector profile; all other assumptions are held the same. The focus of these estimates is on the value of labour supply contributions in the longer term, and as such the modelling has been based on assumptions intended to reflect longer term patterns and outcomes; differences in employment or residency outcomes over the 2020-21 period from COVID-19 restrictions have not been incorporated as it is assumed these will not affect longer term assumptions.

The following table describes the inputs and assumptions used to estimate employment FTE associated with international learners in-study or within 10 years of leaving study, over each projection year 2019 to 2030.

Table 35: Longer-term labour supply impact components, inputs and assumptions

Components	Inputs	Assumptions	Source
Employment FTE of post-study learners working in New Zealand	Number of international learners leaving study in each year, by education provider subsector	Based on the average ratio of people leaving study to enrolments in each year over 2017 to 2019	Analysis of historic numbers of international learners leaving study and enrolments from administrative data in Stats NZ's IDI. For further details see the Data sources for employment and residency pathways section of this Appendix. Enrolment numbers are as specified under each scenario (refer to the description of inputs for fees, expenditure, and visiting family and friends tourism spend in this Appendix).
	Proportion of international learners who remain in NZ and who are employed in an average month, split by education provider subsector and number of years after leaving study	Applies future assumed residency and employment transition rates to historic cohorts from year 0.	Analysis of historic residency and employment status from Census and administrative data in Stats NZ's IDI. For further details see the Data sources for employment and residency pathways section of this Appendix.
	Average FTE adjustment (multiplied by the number of employed former students to determine annual employment FTE)	Part-time workers are assumed to work (on average) 50% of full-time hours	Analysis of historic employment status from Census and administrative data in Stats NZ's IDI. For further details see the Data sources for employment and residency pathways section of this Appendix.
Employment FTE of learners	Student enrolments		As specified under each scenario (refer to the description of inputs for fees, expenditure, and visiting family

Components	Inputs	Assumptions	Source
working while studying			and friends tourism spend in this Appendix).
	Average monthly employment rate for international students in 2019, by education provider subsector	Unfunded PTE students are assumed to have the same employment rate as funded PTE students.	Analysis findings around monthly employment rates for working university, ITP and funded PTE international students in administrative data. Sourced from Universities New Zealand (2021), Working while studying. Additional analysis of employment reported by international students in the 2018 Census was also undertaken as a second reference point.
	Average FTE adjustment (multiplied by the number of employed students to determine annual employment FTE)	Unfunded PTE students are assumed to have the same FTE adjustment factor as funded PTE students.	Analysis findings around approximate weekly hours for working university international students and annual earnings for working university, ITP and PTE students in administrative data. Sourced from Universities New Zealand (2021), Working while studying.

The 2019-2030 employment FTE for each component is allocated to employment sector, occupation category and region using the following assumptions.

Table 36: Longer-term labour supply impact employment sector, occupation category and regional distributions

Components	Assumptions	Source
Employment sector and occupation category profiles	Based on the employment sector and occupation category profiles averaged over years 2-9 post-study. (Note that while sector and occupation profiles vary to a minor extent over this period, averages have been used for simplicity of modelling multiple cohorts.)	Analysis of occupation category and industry sector from Census 2018 data in the IDI. For further details see the Data sources for employment and residency pathways section of this Appendix.
Regional profile for international learners post-study	Based on the regional profile of international learners over years 2-9 post-study. (Note that while regional profiles vary to a minor extent over this period, averages have been used for simplicity of modelling multiple cohorts.)	Analysis of historic residential regions from administrative data in the IDI. For further details see the Data sources for employment and residency pathways section of Appendix B.
Regional profile for international learners in-study	Based on the 2017-19 average regional profile of international student enrolments by education provider subsector	Ministry of Education student counts data

Data sources for employment and residency pathways

Analysis of linked administrative data from Statistics NZ's Integrated Data Infrastructure (IDI) examined:

1. **International learner pathways post-study** – this includes the proportion who leave NZ, those who remain in NZ and transition into the domestic workforce (or not employed or not in the workforce) at different points over time and by number of years post-study. Average employment earnings, employment sector, occupation category/skills profiles are other outcomes of interest. We also explore intra-regional movements as part of this analysis. We note that some aspects of this analysis have previously been carried out by Ministry of Education (1-10 year outcomes in 2013, split by field of study/country of origin), Ministry of Business, Innovation and Employment (1, 3 and 5 year outcomes at 2015) and Universities NZ (outcomes in 2018, focused on university students and not split by years post study).
2. **International learner pathways through study** – this includes the proportion who transition to further education courses, those who work while studying and regional distribution. This was previously looked at by Universities NZ (working while studying in 2018, focused on university students).
3. **Other characteristics while in or post study** – including volunteer rates and household profile.

The analysis explored employment and residency outcomes for the cohort of international students finished studying (i.e., their student visa ended) between 2009-2019. The September 2021 IDI refresh was used for defining and obtaining data on the cohort. This cohort was identified using the migration spells dataset which contains Immigration New Zealand boarder movements and visa approvals. Variables of interest from the datasets below were then extracted for this cohort:

Refer to the insights report for details of the analysis findings, definitions and methodology.

IDI dataset	Variables used
Ministry of Education (MoE) education and training datasets, including schools, tertiary education and industry training datasets	▸ Education provider type ▸ Qualification level ▸ Field of study ▸ Region of study
Immigration NZ (INZ) migration spells dataset	▸ Visa type and duration ▸ Education provider type (for identifying ELS and unfunded PTE students, since MOE enrolment data does not cover enrolments from these non-funded provider types)
Inland Revenue Department (IRD) data	▸ Annual wages and salary earnings. Employment status over the year was derived from this information
2018 Census	▸ Labour force and employment status (whether employed full-time, part-time, not in the workforce or unemployed at the time of the 2018 Census) ▸ Industry sector (ANZSIC code) of employment ▸ Occupation type (ANZSCO code) ▸ Occupation skill level ▸ Volunteer status
SNZ derived datasets	▸ Estimated Residential Population (ERP) status ▸ Residential location during and post-study

Model input, implementation and output checks

Analysis findings used to inform the assumptions and inputs used for CGE modelling were subject to sense checks against external sources and research studies where comparable. Examples include previous studies carried out by the Ministry of Education (for example, 1-10 year post-study outcomes in 2013, split by field of study/country of origin), Ministry of Business, Innovation and Employment (1, 3 and 5 year post-study outcomes at 2015 for international learners) and Universities NZ (in-study employment rates and post-study outcomes in 2018 for international university students). Refer to Appendix D for reference details for each of these studies.

Input and feedback was also provided by the ENZ project team to help sense check and refine analysis findings before finalising model inputs and assumptions.

The quality assurance process undertaken for the CGE modelling included review and validation undertaken by a senior EY CGE modelling practitioner separate to the team carrying out the model input, simulation and output generation tasks. The review process included:

- Review of the modelling approach undertaken, including adjustments to underlying model formulae required to allow for simulations at a New Zealand region level and for inputs and outputs segmented by economic sector.
- Review of model inputs for reasonableness and consistency with original data sources.
- Review and validation of modelling outputs, including checking model behaviour and comparison of model outputs with known comparable metrics for reasonableness.

Appendix C Detailed approach for quantitative analysis of longer term economic impacts

Education-based human capital

The methodology used for this analysis is derived from an econometric analysis performed on behalf of Universities Australia[73]. The original econometric analysis took a variety of factors[74] and applied them to estimate the impact that higher education research and development (R&D) spending will have on the GDP of a country. With this model as our base, we have developed a New Zealand specific econometric model that estimates the overall impact that changes in higher education research and development (R&D) spending have on GDP output.

While the original model takes data from a wide range of countries, we focus solely on New Zealand. This creates some challenges, as applying a one-to-one translation of the model will lead to both statistically insignificant and non-intuitive effect sizes. This comes as a result from using only NZ data, along with specific NZ economy qualities.

NZ has a relatively good record of data for most of the variables involved in this analysis, but granular data on the country's spending on R&D for higher education as well as other sectors is lacking. The data only provides real expenditure for every second year, thus requiring a level of extrapolation. This will not be fully accurate to the true spend, and add a level of variability to the results. The time-period of this analysis was also constrained to 40 years[75] as fundamental changes in policy, technology, and the overall economy that have occurred over this period mean that use of older datapoints would be inappropriate. While this is not an insignificant amount, this represents a small fraction of the original worldwide dataset, which is estimated to have 1000+ datapoints.

NZ also has economy specific qualities that may lead to different effect sizes compared to the rest of the world. As a country New Zealand is relatively less productive (work longer for lower output)[76] and captures less of the innovation produced by R&D[77]. This may lead to some variability in effect sizing especially with respect to the R&D impacts.

Taking this into account, we modify the original model to only include four of the original variables of interest. Tertiary education attainment, population growth, gross capital formation, and higher education R&D spending. We also apply the use of a first-differences estimator, which lowers additional uncaptured bias that may rise from the model[78].

$$(Y_t - Y_{t-t}) = \beta_0 + \beta_1(h_t - h_{t-1}) + \beta_2(n_t - n_{t-1}) + \beta_3(sk_t - sk_{t-1}) + V1_t$$

Results

Parameter	Effect size[79]
h(t)	18266.75*
n(t)	43.96
sk(t)	204.53**
V1	3.34**

[73] Deloitte Access Economics (2015), The importance of universities to Australia's prosperity

[74] Tertiary education attainment, population growth, gross capital formation, expenditure on higher education R&D, expenditure on other R&D, total trade as a % of GDP

[75] 1980 to 2019

[76] New Zealand Productivity Commission (2021), Productivity by the numbers

[77] New Zealand Productivity Commission and Motu (2015), R&D expenditure and innovation by Kiwi firms

[78] The equation below highlights the specification used for the analysis

[79] *denotes p-value < 0.1, ** denotes p-value < 0.05

Regression Statistics	
Multiple R	0.69771678
R Square	0.486808705
Adjusted R Square	0.426433259
Standard Error	425.2776757
Observations	39

ANOVA

	df	SS	MS	F	Significance F
Regression	4	5833149.986	1458287.496	8.063024523	0.000110178
Residual	34	6149277.45	180861.1015		
Total	38	11982427.44			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	53.16937715	175.120441	0.303616053	0.763270677	-302.7181775	409.0569318	-302.7181775	409.0569318
h(t), TEA	18266.75811	10826.52655	1.6872224	0.10071578	-3735.391033	40268.90726	-3735.391033	40268.90726
n(t), population growth	43.95912552	170.6206822	0.25764242	0.798235917	-302.783819	390.70207	-302.783819	390.70207
sk(t), GCF	204.5317694	41.71146583	4.903490331	2.2904E-05	119.763872	289.2996668	119.763872	289.2996668
V1 (H R&D)	3.343478356	1.626175368	2.056038003	0.047520967	0.038692394	6.648264319	0.038692394	6.648264319

Our regression analysis has an R^2 value of 0.48, and an adjusted R^2 value of 0.42. These model outputs appear to be relatively reasonable. Due to taking first differences, our true count of observations sits at 39. While this is still a small sample size and will lead to bias, it is reasonable enough to work with.

The signage of our results is consistent with the prior Australian model. However, note that the size of the effects cannot be compared. This is because of the variations between the design of this model and the Australian model. The Australian model used a logarithmic specification, meaning that the outputs represented a percentage change in output for a percentage change in the dependant variables, and had a broader range of dependant variables to try and capture a larger range of effects. Our model uses a relatively narrow set of dependant variables and a first difference model to address any excluded variable bias. This makes the effect sizes between the two difficult to compare. Because our model focusses on true effects, the coefficients can be determined as a number increase in output per capita, since GDP is the general measure of output this is in dollar terms).

Tertiary education attainment is the proportion of the population aged over 15 years that has some sort of tertiary education. Our regression analysis indicates that as a higher proportion of the population gets a tertiary qualification, the country's output per capita increases. Note that the variable used in the analysis is the yearly difference in tertiary education attainment (TEA). As an example, if tertiary education attainment were to increase from 75% to 75.5% year-on-year then h(t) would be 0.005. A one percentage point increase in tertiary education attainment from the prior year would lead to an increase of $182.66 in GDP per capita (from the prior year).

Our results for the population growth variable, n(t), suggest there is no statistically significant change in output from an increase in New Zealand's population. While there are many potential effects from an increase in population, this highlights the potential for these effects to cancel each other out. An increase in population typically leads to higher GDP per capital based on the level of technology and productivity a country has, but will naturally also lead to it decreasing, due to the increased population size. It is likely that these confounding effects are what led to population growth being statistically insignificant to the model.

Sk(t) denotes the gross capital formation, which is a measure of the level of investment in an economy and is measured as a percentage of GDP. This, therefore, shows the level of investment in an economy as a percentage of that economy's GDP. Our results shows that a one percentage point increase from year to year in the gross capital formation will increase year on year GDP per capita by $204 and is significant at the 1% level. This outcome aligns with economic theory as investment is a key input into a GDP specification.

The last variable examined was the expenditure on higher education research and development on a per capita basis. This variable is also a statistically significant predictor of output growth. A one-

dollar per capita increase in higher education R&D spending increases year on year output by $3, according to our model.

Bilateral trade relationships

Analysis was performed on the bilateral trade flows and international student enrolments for several countries with whom New Zealand has significantly opened trading relationships over the past 20 years, along with similar countries that have not significant changed their trade dynamics over that period. China, India, South Korea, Singapore, USA and Canada combined (North America) were included in this exercise.

A two-step approach was employed to analyse the impact of international students on trade openness.

1. Trade openness between New Zealand and various other countries relative to the number of international students from that country (as a proportion of total international students enrolments) was examined. While trade openness indices exist, these analyse the aggregate openness of a single country to the rest of the world rather than showing the level of bilateral trade integration / openness between countries. Trade economics literature has tried, with limited success, to develop a standard measure of bilateral trade openness. Depending on the research and its purpose different approaches have been employed including: the number of trade agreements between countries[80], country-specific metrics, and trade flows. Bilateral trade flows are used frequently as the data is widely available and the analysis is parsimonious. That is the approach employed in this analysis where the aggregate value of imports and exports[81] between NZ and a given trading partner as a proportion of New Zealand's GDP is used as a relative measure of bilateral trade openness.

2. A statistical test (the Granger causality test)[82] between trade openness and the number of international students from the specific country was performed to understand the correlation between those two vectors and the directionality of the vectors (i.e. does an increase in student numbers precede an increase in trade openness). These tests can then be used infer if there is a consistent relationship between international student numbers and international trade.

   The Granger causality test looks at the effect of the prior years' international student numbers on future trade flows. Different lags for each country were tested to determine the time differences that would generate the most accurate results. Country specific lags were identified for each country. The counterfactual relationship of trade flows on student numbers was also tested to help determine the direction of any relationship.

Trend analysis

Before conducting formal statistical analysis, trends of international student enrolments and trade-flows were examined to identify whether there was an apparent correlation between international student numbers and trade flows. Trade flows are shown in the graphs below as a percentage of GDP, while student enrolments are shown as a percentage of the total number of international students enrolled in New Zealand for each year.

There was a large increase in the number of international students coming from China in the early 2000s which appears to align with the steady growth in China-New Zealand trade flows. Since its peak, international student numbers decreased before steadily rising once more. This potentially

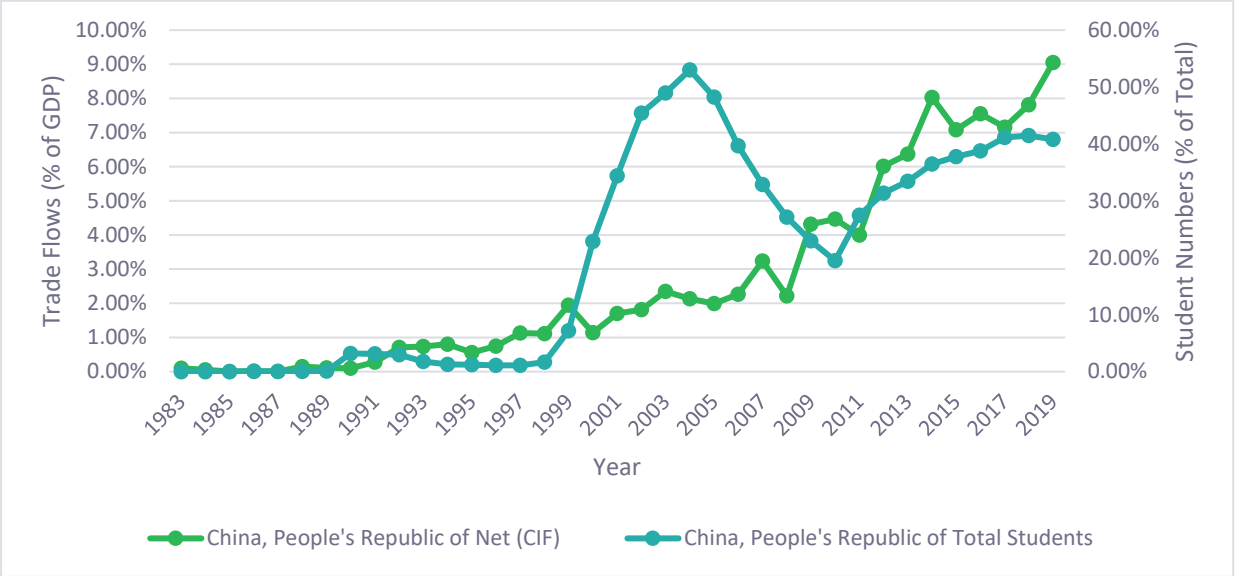
[80] While on the surface a higher number of trade agreements between countries would appear to be better, this is hardly ever the case, as free trade agreements (FTAs) typically tend to be comprehensive and go under review over time, and it is observed that countries with higher barriers to trade will typically have higher numbers of bilateral trade agreements.

[81] Note that this is the difference due to the trade balance (exports – imports).

[82] A Granger causality test with H_0: an increase in international students does not Granger cause an increase in trade openness between NZ and the country subject to analysis.

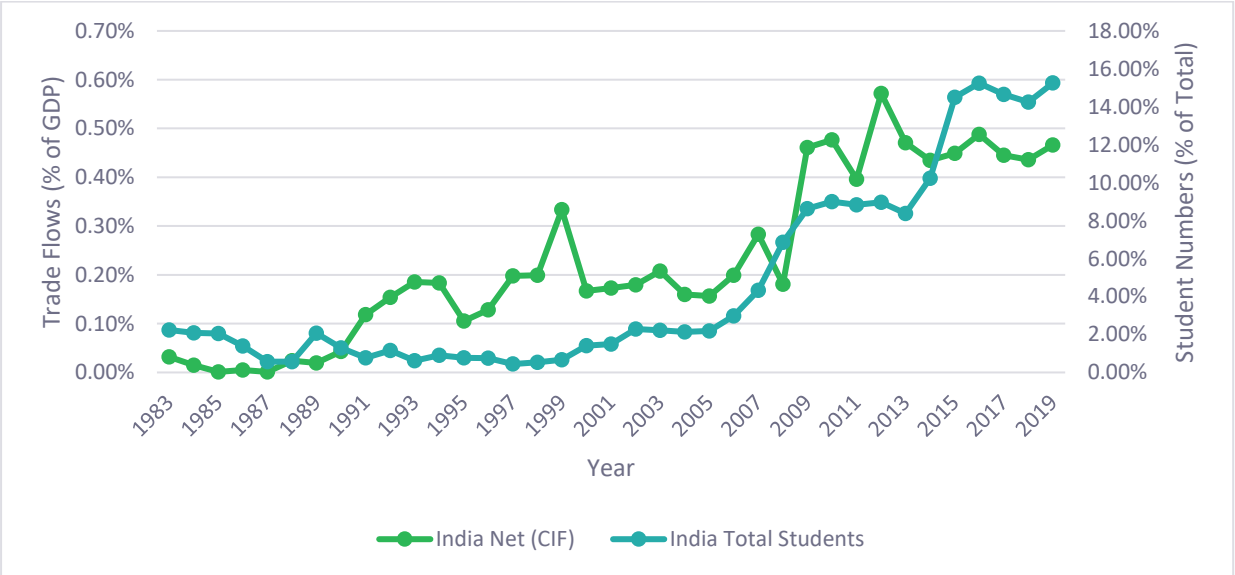
suggests limited correlation between international student numbers and trade flows with respect to China.

Figure 13: China-NZ international student enrolments and trade flows



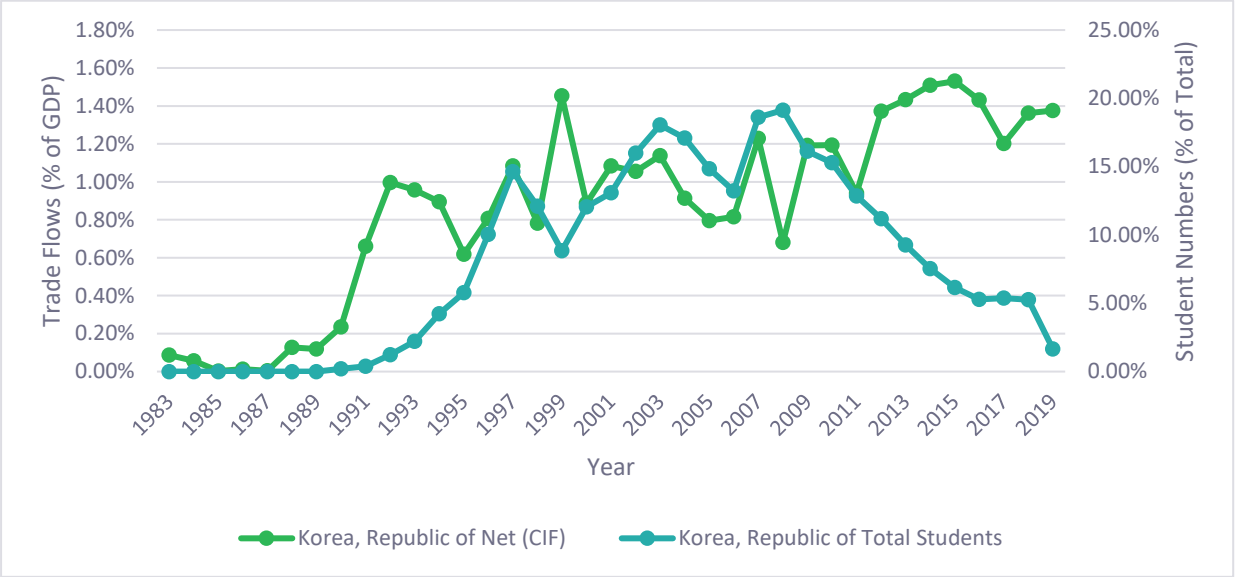
Data for Indian student enrolments along with trade flows suggests that there may be a correlation between the factors. However, there are strong time-trend elements in each data source making it challenging without formal statistical testing to ascertain if there is a 'causal' relationship between the trade-flows and international student numbers or whether both are increasing over time as a result of exogenous factors.

Figure 14: India-NZ international student enrolments and trade flows



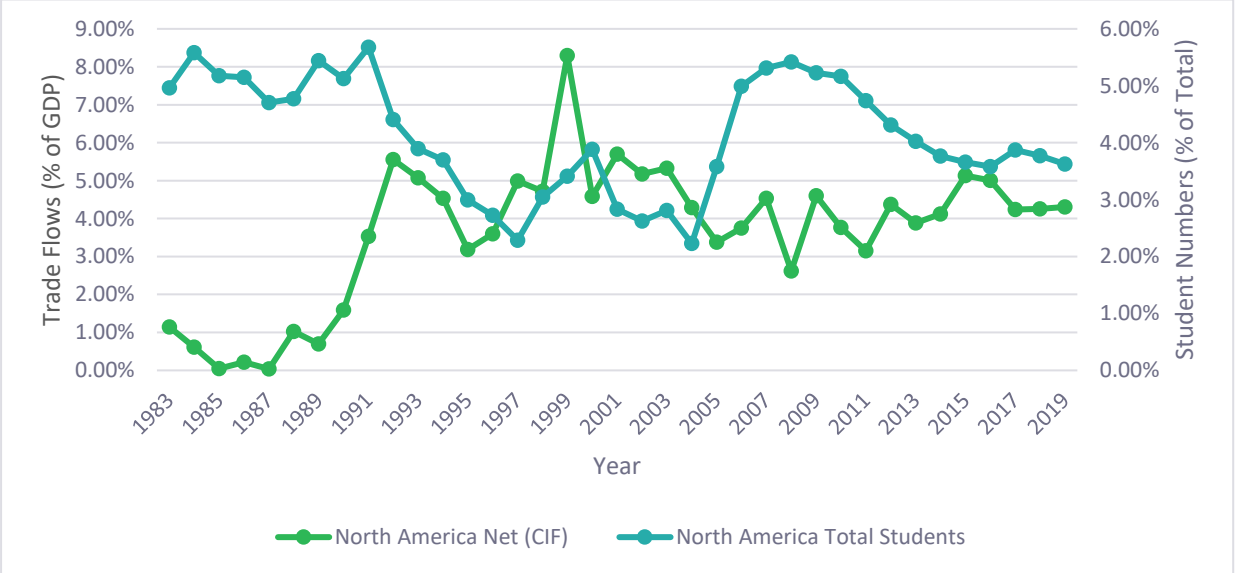
The data for South Korea shows there may have been a previous relationship between the international student numbers and trade flows, however since 2011 international student enrolments from South Korea have dropped off significantly. The decline in international student numbers was not followed by a decline in trade flows, implying that there are likely to be external drivers for enrolments that have affected this potential relationship.

Figure 15: South Korea-NZ international student enrolments and trade flows



There appears to be little correlation between North American (USA and Canada) international student enrolments and trade flows; while both student enrolments and trade flows seem to have followed a similar pattern in the late 1990's to early 2000's, outside of this limited range there does not seem to be any visual correlation between the two.

Figure 16: North America-NZ international student enrolments and trade flows



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