



The Economic Impact of International Education 2012/13

for Education New Zealand

September 2013

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1. Executive Summary

International education comprises both onshore and offshore activity.

With regard to onshore activity, and for the purpose of deriving an economic value of international education, Education New Zealand defines an international student as someone who has crossed borders expressly with the intention to study. As such, categories considered domestic under the Education Act have also been included, in addition to what the Ministry of Education defines as “full fee-paying students.”

We also include PhD students, although they are no longer defined as full fee-paying. This is because since 2006 they pay the same fees as domestic students so there are no specific international fee schedules for this group.

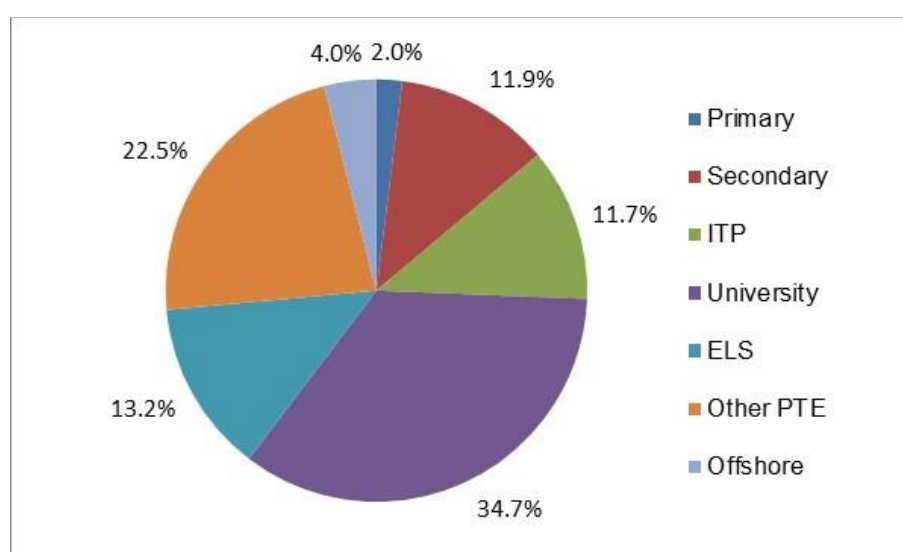
International education comprises expenditure by international students in New Zealand and the offshore activities of New Zealand educational institutions. We have estimated the size of the industry from the results of a large web-based survey of students and an email survey of offshore providers. The main results are:

1. The gross output of the industry is \$2.6 billion, comprising:

Full fee-paying students:	\$2309m
PhD students:	\$97m
Other international students ¹ :	\$85m
Offshore activities	<u>\$104m</u>
	\$2595m

2. With regard to domestic provision the largest education sub-industry or sector is university education, with such students accounting for around 23% of the total number of students, but a much higher 35% of total gross output.

Figure 1.1: Composition of the \$2595m International Education Gross Output



¹ Other includes Exchange, NZ Aid and Foreign Research Post-Graduate students. See Table 4.6.

3. China contributes 25% of students and 32% of total onshore spending. However, the highest average spending is by Malaysian students, due to a relatively high proportion of them being university students – and universities charge the highest fees. Excluding tuition fees, students from Saudi Arabia have the highest average spending.
4. The dominant New Zealand region of study is Auckland, which attracts 61% of students and 63% of onshore spending. Otago has the highest average spend by international students, due to its relatively high number of university students. Excluding tuition fees the highest average spend is by Auckland students.
5. With regard to offshore provision, the largest activity is educational services delivered offshore, at \$70m. Saudi Arabia is the largest identifiable destination for offshore activity.
6. Table 1.1 presents a comparison with 2008. While the number of full fee-paying and PhD students has not recovered from the peak in 2003/04, it has surpassed the 2007/08 total. In value terms the size of the international education industry in 2012/13 is much the same as in 2007/08, which should not be surprising in the context of the global economic situation over the last five years. In another five years renewed international economic growth can be expected to lead to a larger industry.

Table 1.1: Historical Comparison

	Number			
	<u>2001/02</u>	<u>2003/04</u>	<u>2007/08</u>	<u>2012/13</u>
Full Fee-Paying	68217*	112672*	91321	91732
PhD students			1668	3013
Other international students			<u>3878</u>	<u>3437</u>
Total international students			96867	98182
	Value (\$m)			
	<u>2001/02</u>	<u>2003/04</u>	<u>2007/08</u>	<u>2012/13</u>
Full Fee-Paying	945*	1999*	2287	2309
PhD students			40	97
Other international students			82	85
Offshore provision			107	104
Total value			2516	2595

*Includes PhD. Source: Ministry of Education

2. Background

Education New Zealand commissioned Infometrics and National Research Bureau (NRB) to estimate the current size of the international education industry – comprising expenditure by international students in New Zealand and the offshore activities of New Zealand educational institutions.

In 1999 the contribution of international education to gross domestic product (GDP) was estimated at \$545m. By 2001 this had more than doubled to \$1.3 billion. In 2004 the estimated contribution had passed the two billion dollar mark, with the industry's value-added estimated at approximately \$2.2 billion.²

In 2008 the international education industry generated around \$2.3 billion of foreign exchange and the industry's contribution to New Zealand's gross domestic product was estimated at approximately \$2.1 billion. Offshore provision earned \$70 million.³

Before 2008 expenditure by full fee-paying students was derived from combining general surveys of tertiary student expenditure (with a small sub-sample of international students), surveys carried out at specific institutions, international visitor surveys and household economic surveys. None were based on a dedicated survey of expenditure by international fee-paying students and all excluded the offshore provision of educational goods and services by New Zealand companies and educational institutions. The 2008 figures were the first to be estimated from dedicated surveys of full fee-paying students in New Zealand and offshore providers.

The same approach has been used to estimate the size of the international education industry in 2012, although the surveying technique has changed from randomly issued questionnaires to a web-based survey sent to all students for whom the New Zealand Immigration Service supplied contact details.

The following section sets out the study methodology in more detail. Section 4 presents a summary of the onshore component of the international education industry, looking at student numbers and tuition fees by sub-industry (type of institution), New Zealand region of study and source country or region.

Section 5 is entirely devoted to offshore provision, while Section 6 present some options for follow-up research.

² See Infometrics, NRB & Skinner Strategic (2008): *The Economic Impact of Export Education*. Report to Education New Zealand and Ministry of Education.

³ op cit

3. Methodology

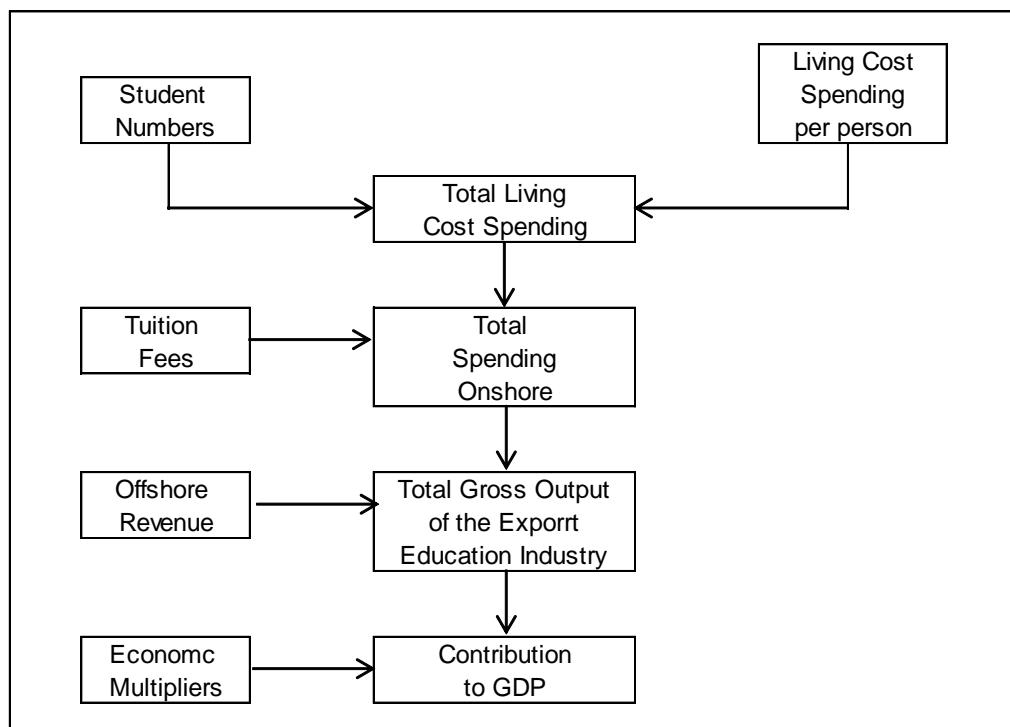
Overview

The size of the international education industry is estimated using data from four main sources:

1. Ministry of Education data on the number of international students and their tuition fees.
2. A web-based survey of expenditure by students on living costs.
3. An email survey, with some personal interviews of educational providers who provide goods or services offshore.
4. Economic multipliers from Butcher Partners.

The diagram below illustrates how the data is combined. Official data on the number of students is used to weight the results of the survey of spending on living costs in order to obtain estimates of total spending. The primary weighting is by type of educational institution, with second-level weighting by New Zealand region of study and/or student source country/region.

Figure 3.1: Steps in Methodology



Combining total spending on living costs with total spending on tuition fees yields an estimate of the total amount of onshore spending by international students. Again this total spending can be disaggregated by institution of study and so on.

Adding on revenue from offshore activities provides an estimate of the total gross output of the export education industry.

After adjusting for the import content of spending, earnings by students while in New Zealand, and the purchase of second hand goods, it is possible to obtain an estimate of the contribution of the international education industry to New Zealand's Gross Domestic product (GDP).

Survey of Student Living Costs

Expenditure on living costs is measured over the number of months, up to and within the last 12 months, that the student has been in New Zealand. It is obtained from a large web-based survey of international students. Invitations to participate in the survey were sent to all usable email addresses provided to us by Immigration New Zealand. That is, there was no sampling. Approximately 7500 responses were received. Responses were weighted by the student numbers in Tables 4.1 and 4.2. As the survey is over 20 pages long it is not included in this version of the report. It is available on request.

There were two versions of the survey; one for students who are required to be with a carer, and one for all other students. With regard to the former it is a deliberate intention to capture the spending of the carer as well as that on behalf of the student. As the carer would not be in New Zealand, but for the student, their combined spending is attributed to international education.⁴

We advise some caution with regard to the estimated expenditure by primary students and their carers, as only 40 usable responses were secured.

As might be expected with a self-completion web-based survey, a number of nonsensical responses occur, along with legitimate outliers. An example of the former is where a student answered with their telephone number when asked about their monthly spending on telephone services. With thousands of replies and dozens of questions it is impractical to check every answer to every question. Thus we use a number of filters to identify numerical values that are clearly errors – a telephone number is easily spotted as it is much larger than any conceivable monthly telephone cost. More difficult to deal with are answers that could be errors or could be legitimate outliers, such as where someone claims to spend \$1000 per month on telephone services.

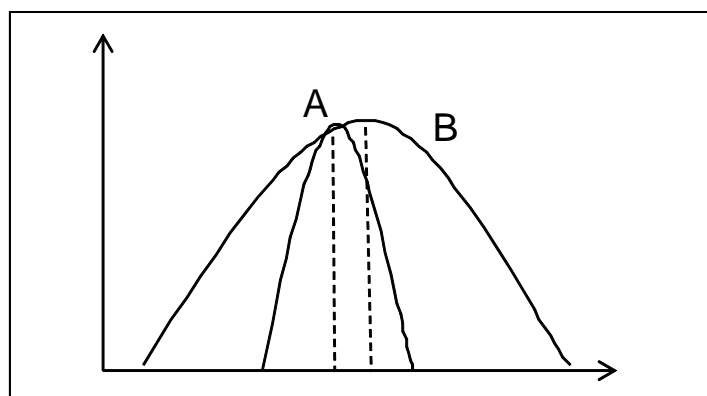
Hence for each question we calculate the mean and standard deviation from the raw data, and then recalculate the mean with all cell values that are greater than the lesser of the raw value or the original mean plus five standard deviations, excluded. We look at the effects of changing this assumption.

An advantage of inviting students to complete a web survey is that the number of responses is likely to be (and indeed was) much larger than what can be economically achieved by random interception of students at educational institutions. A disadvantage, however, is that one has no control over the randomness of replies. That is, are the spending patterns of those who choose to respond representative of all students, or are they biased in some way? Without direct comparison we can never be certain of the answer, but it may not matter that much. In Figure 3.2 the more concentrated distribution given by A represents a large non-random population that contains some bias. Distribution B in contrast has no bias, but a small sample size increases the probability of obtaining a biased estimate. Thus as long as the bias in A is not too large,

⁴ There is a possibility of double counting in this regard if carers do not select 'education' on their arrival/departure cards as their main purpose of visit.

a non-random sample may yield an estimate of spending that is closer to the true value than a proper random, but much smaller sample. In statistical parlance, the efficiency of estimate A is better than that of B.

Figure 3.2: Bias versus Variance



Survey of Offshore Providers

The survey asked about revenue from offshore provision for a recent twelve month period, although most figures relate to calendar 2012. A copy of the survey is appended.

Our list of contacts came from Education New Zealand, an incomplete record from the 2008 study which drew on information from New Zealand Trade & Enterprise, and some additions and changes as we progressed. The sample is certainly not representative in a statistical sense, so it would not be valid to extrapolate the results to a larger population of providers. Excluding publishing, we would be surprised if the underestimate of sector revenue is more than 10% and is probably within 5%. Given the year to year variation in earnings from offshore education this is a reasonable error margin.

Eight contacts were visited personally, including two of the largest industry players. This also provided the opportunity to refine the initial versions of the survey. Most other surveys were completed by email.

The profile of responses is shown in Table 3.1. Eighty percent of enterprises (44) responded, although a quarter of this group had no income from offshore provision in 2012. Only four contacts refused to participate; on the grounds of confidentiality, being too busy, or simply not being interested. Another two stated that they would respond, but never did (in spite of numerous follow-ups), while five contacts did not respond at all despite at least four communications.

Table 3.1: Response Profile

Category	No.
Responded with offshore income	33
Responded but no offshore income	11
Refused to participate	4
Promised, but not delivered	2
No response	5
	55

The results from the survey of offshore providers are presented in Section 5.

4. International Students in New Zealand

The following two sections relate to students classified as “full fee-paying” by the Ministry of Education. Sections on other types of international students follow.

Full Fee-Paying Students

Numbers

Data on the number of full fee-paying students (which excludes PhD students) by type of provider for 2012 was supplied by the Ministry of Education. To maintain comparability with earlier research, six types of provider – also referred to as sub-industries of the Education industry – are identified:

1. Primary
2. Secondary
3. Institutes of technology and polytechnics
4. Universities
5. English language schools
6. Other private tertiary establishments

Table 4.1 shows the distribution of full fee-paying students by education sub-industry and region of study. Auckland totally dominates the industry, with 63% of total students and also the most students in any category, particularly with regard to Other PTE students, 82% of whom study in Auckland. The PTE sub-industry also has the most students, but as seen below in Table 4.3, it is not the most valuable sub-industry when measured in terms of fee income.

Table 4.2 shows the distribution of full fee-paying students by main source country or region. As in previous years China (including Hong Kong) still tops the rankings, with 27% of students. India is next followed by South Korea and then Japan. Each is still a long way behind China, but the three combined account one third of all students.

No other individual country accounts for more than 5%, although Saudi Arabia is close. The groups Other South-East Asia and Other Europe (which excludes only Germany) each account for more than 6%.

The three largest cells in the table are Chinese students attending universities and other PTEs, and Indian students attending other PTEs; together representing about one quarter of students.

The total number of students was almost 91,732, representing a small increase (0.5%) on the 2007 figure of 91,321. It seems that the student numbers have only just recovered from the global financial crisis. However, there has been a change in the institutional composition of student numbers since 2007, with the number of students attending primary schools, universities and ELS declining, although these declines have been more than offset by the growth in the number of students attending secondary schools, polytechnics (ITPs) and Other PTEs.⁵

⁵ Source for 2007 figures: Infometrics et al, op cit.

Tuition Fees Income

Tables 4.3 and 4.4 present data on revenue from tuition fees, tabulated from data on full fee-paying students supplied by the Ministry of Education. Total fee income amounted to \$743m in 2012, compared to \$597m in 2007, an increase of 24%. Universities in particular have increased their fees (in New Zealand dollars) – by an average of 31%, although this has probably contributed to fall in the number of international university students of about 13%.

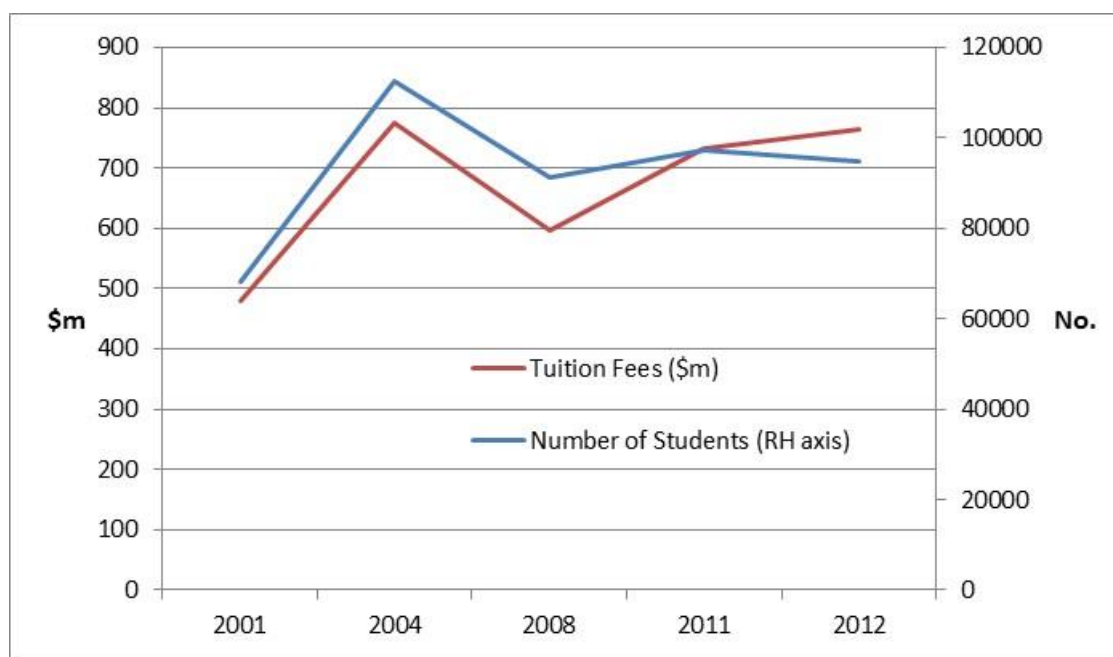
The most valuable sub-industry by a large margin is university education, which accounts for about 42% of total fee income. A mean tuition fee of around \$17,000 is driving this result.⁶ As most university students study in Auckland it is not surprising that Auckland is also the most valuable fee income region, contributing over 60% of total fee income.

With regard to country/region of origin (Table 4.4), the top five countries rank the same for fee income as they do for the number of students. China is the most valuable market, accounting for a nearly a third of tuition fee income, with about half of this attributable to Chinese students attending university.

The top three countries (China, India and South Korea) account for more than half of total fee income. In 2007 India did not rank amongst the top source countries; it has knocked Japan into fourth place.

The trend in student numbers and tuition fee income is shown in Figure 4.1. Neither series has reached the peaks that were attained in 2004, but since 2008 the increase in tuition fee income has outstripped the decrease in student numbers.

Figure 4.1: Historical Trends



⁶ Note that international PhD students pay the same tuition fees as New Zealand students.

Table 4.1: Number of Students by Region of Study

	Auckland	Waikato	Wellington	Canterbury	Otago	Other North Island & NA*	Other South Island	Total
Primary	1769	114	53	221	38	299	42	2536
Secondary	7308	691	848	1161	758	1678	663	13107
ITP	4188	1077	753	1196	434	3088	1128	11864
University	8796	2353	2186	1696	1733	1167	4	17935
ELS	12726	724	1081	993	890	1331	301	18046
Other PTE	<u>23171</u>	<u>524</u>	<u>498</u>	<u>1172</u>	<u>1077</u>	<u>1744</u>	<u>58</u>	<u>28244</u>
	57958	5483	5419	6439	4930	9307	2196	91732

*NA includes extramural, Correspondence School and unidentified

Table 4.2: Number of Students by Source Country and Region

	Primary	Secondary	ITP	University	ELS	Other PTE	Total	%
China	161	3457	3793	6707	1974	8319	24411	26.6%
India	8	48	3039	964	50	7240	11349	12.4%
South Korea	1693	2026	537	933	2086	2715	9990	10.9%
Japan	233	2022	700	959	3776	1873	9563	10.4%
Saudi Arabia	99	84	538	922	1586	973	4202	4.6%
Germany	17	1890	104	242	732	93	3078	3.4%
Thailand	89	1087	113	223	766	564	2842	3.1%
Brazil	6	344	58	32	1310	783	2533	2.8%
Viet Nam	8	349	169	794	215	623	2158	2.4%
Other South-East Asia	70	454	1103	2369	764	1816	6576	7.2%
Other Europe	68	529	520	743	3184	763	5807	6.3%
USA, Canada, Mexico	21	101	115	1838	50	293	2418	2.6%
Pacific Island	14	211	525	325	7	631	1713	1.9%
Latin & South America	7	256	66	77	886	480	1772	1.9%
Other Middle East	9	70	39	349	158	347	972	1.1%
Other	<u>33</u>	<u>179</u>	<u>445</u>	<u>458</u>	<u>502</u>	<u>731</u>	<u>2348</u>	2.6%
Total	2536	13107	11864	17935	18046	28244	91732	

Source for both tables: Ministry of Education defined "full fee-paying students."

Table 4.3: Tuition Fee Revenue by Region of Study (\$m)

	Auckland	Waikato	Wellington	Canterbury	Otago	Other North Island & NA*	Other South Island	Total	Mean Fee
Primary	7.118	0.599	0.243	1.322	0.172	1.566	0.106	11.126	4387
Secondary	64.093	5.979	6.507	10.112	5.726	11.053	4.304	107.774	8223
ITP	38.913	9.589	8.191	8.407	3.048	20.489	6.308	94.944	8003
University	167.592	25.593	31.569	28.881	34.229	20.966	0.075	308.906	17224
ELS	27.017	1.537	2.295	2.108	1.889	2.826	0.639	38.312	2123
Other PTE	<u>145.405</u>	<u>3.566</u>	<u>4.263</u>	<u>10.033</u>	<u>5.755</u>	<u>12.404</u>	<u>0.560</u>	<u>181.987</u>	<u>6443</u>
	450.137	46.863	53.069	60.863	50.820	69.304	11.993	743.049	8100

*NA includes extramural, Correspondence School and unidentified

Table 4.4: Tuition Fee Revenue by Source Country and Region (\$m)

	Primary	Secondary	ITP	University	ELS	Other PTE	Total	%
China	0.782	33.544	34.525	118.760	4.191	51.719	243.521	32.8%
India	0.041	0.426	25.175	16.848	0.106	44.205	86.801	11.7%
South Korea	7.396	19.570	3.301	17.427	4.429	15.576	67.699	9.1%
Japan	0.986	14.345	3.386	6.011	8.016	14.163	46.908	6.3%
Saudi Arabia	0.590	0.445	5.714	14.886	3.367	7.345	32.347	4.4%
Germany	0.074	10.238	0.578	3.217	1.554	1.461	17.122	2.3%
Thailand	0.292	10.154	0.766	3.972	1.626	3.944	20.755	2.8%
Brazil	0.035	2.144	0.276	0.480	2.781	4.326	10.043	1.4%
Viet Nam	0.049	3.540	1.573	11.036	0.456	3.831	20.485	2.8%
Other South-East Asia	0.332	4.325	8.435	58.370	1.622	11.567	84.651	11.4%
Other Europe	0.193	2.676	2.191	9.896	6.760	8.273	29.987	4.0%
USA, Canada, Mexico	0.044	0.678	0.717	24.085	0.106	1.979	27.610	3.7%
Pacific Island	0.080	2.004	3.961	6.225	0.015	3.518	15.803	2.1%
Latin & South America	0.044	1.121	0.290	1.766	1.881	3.176	8.278	1.1%
Other Middle East	0.079	0.760	0.394	7.485	0.335	1.665	10.718	1.4%
Other	<u>0.108</u>	<u>1.805</u>	<u>3.663</u>	<u>8.444</u>	<u>1.066</u>	<u>5.238</u>	<u>20.323</u>	2.7%
Total	11.126	107.774	94.944	308.906	38.312	181.987	743.049	

Source for both tables: Ministry of Education defined "full fee-paying students."

International PhD Students

International PhD students in New Zealand pay the same fees as domestic students. They are not categorised as “full fee-paying students” in Ministry of Education data and hence are not counted in Tables 4.1-4.4. From an industry perspective, however, they are nonetheless international students studying in New Zealand. For 2012 the Ministry recorded 3013 such students. Table 4.5 summarises their New Zealand location of study and their source country/region.

Table 4.5: Profile of PhD Students⁷

NZ Region of Study	No.	Source Country/Region	No.
Auckland	1040	Malaysia	305
Waikato	2	China	284
Wellington	473	India	237
Other North Island	333	United States	232
Canterbury	658	Germany	189
Otago	503	Other SE Asia	592
Other South Island	0	Other Europe	419
Unknown	4	Middle East	265
	3013	Other	227
		Other North America	132
		Latin & South America	131
			3013

Source: Ministry of Education

Auckland’s share of PhD students at about a third, is well under both its 63% overall share of international students and its 50% share of international university students. Waikato is also (markedly) under-represented while Wellington, Canterbury, Otago and Other North Island (Palmerston North) are over-represented.

Malaysia is the largest single source country of PhD students, followed by India, China and the United States. In contrast to Table 4.1, South Korea and Japan are not major sources countries for PhD students.

Because data on the tuition fees that PhD students pay is not collected by the Ministry of Education, we have estimated the mean PhD fee from other sources at \$6600.⁸ The estimate should be seen as approximate, as fees vary by subject and by the ratio of coursework to thesis; information which we do not possess.

Other International Students

As well as the 3013 PhD students there were another 25,259 other international students in 2012 who were not classified as full fee-paying. See Tables 4.6 and 4.7. Of these, 3437 could be classified as international students; the remaining 21,822 are

⁷ One Waikato based provider categorised PhD students as exchange students. These students are captured in table 4.8 “Other international students”.

⁸ <http://www.universitiesnz.ac.nz/files/FEESNZ2013.pdf>

international students in the broad sense of the word, but are not in New Zealand primarily for study. They are therefore excluded from our analysis.

Table 4.6: Other International Students in 2012

	No.
Exchange students	
Primary school	21
Secondary school	1,120
Polytechnics	123
Universities	1,222
Private Training establishments (PTEs)	<u>3</u>
	2,489
NZ AID students	
Polytechnics	55
Universities	314
Private Training establishments (PTEs)	<u>7</u>
	376
Foreign Research Post-Graduate	
Polytechnics	59
Universities	<u>513</u>
	572
Total	3437

Source: Ministry of Education.

**Table 4.7: Other International Students in 2012
(not included in valuation of international education)**

	No.
Refugee/ protected international students	
Primary school	361
Secondary school	218
Universities	<u>2</u>
	581
International students with parent(s) holding current work permit	
Primary school	12,310
Secondary school	<u>8,159</u>
	20,469
Visiting military/ Diplomatic families/Op Deep Freeze	
Polytechnics	2
Universities	61
Private Training establishments (PTEs)	<u>2</u>
	65
International students doing Off-job training	
Polytechnics	70
Private Training establishments (PTEs)	<u>637</u>
	707
Total	21822

Source: Ministry of Education.

Table 4.8 summarises the New Zealand location of study and source country /region for the students in Table 4.6. Auckland is the dominant New Zealand location with a market share of close to a third, but again this is less than its share of full fee-paying students. Other European countries and Germany are main sources of these students, accounting for 40% of the total.

Most of these 'Other' international students have their fees paid by New Zealand residents or entities, such as through the Ministry of Foreign Affairs and Trade. In other cases there are exchanges of students between New Zealand and foreign institutions with no associated fees at all. In addition we understand that NZ Aid and students doing off-job training have their living costs paid by New Zealand. However, for Foreign Research Post Graduate students the Ministry of Education estimate a mean tuition fee, net of any New Zealand subsidy, of \$25,000.⁹

On the basis of Education New Zealand's definition of international students, we assume that the living cost of these 'Other' students are not paid for by New Zealand.

Table 4.8: Profile of Other International Students

NZ Region of Study	No.	Source Country/Region	No.
Auckland	1089	China	243
Waikato	530	India	73
Wellington	499	South Korea	48
Other North Island	521	Japan	162
Canterbury	247	Malaysia	61
Otago	391	Saudi Arabia	45
Other South Island	148	Germany	367
Unknown	<u>12</u>	Thailand	45
	3437	Viet Nam	50
		Other South-East Asia	214
		Other Europe	1009
		USA, Canada, Mexico	459
		Pacific Island	234
		Latin & South America	157
		Other Middle East	53
		Other	<u>217</u>
		Total	3437

Source: Ministry of Education

Economic Impact of International Students

Total expenditure including tuition fees is summarised in Table 4.9, with a split by education sector (education sub-industry) shown in Figure 4.2.

As outlined in Figure 3.1 there are two different measures of the economic impact of international students studying in New Zealand. In particular:

⁹ Communication between the Ministry of Education and Education New Zealand.

Table 4.9: Economic Impacts by Education Sub-Industry 2012

		Total
Gross Activity		
Number of students	No	98182
Total gross spend	\$m	2491
Value-Added Analysis		
Total net spending^	\$m	1887
Employment	No.	13607
Value-Added	\$m	1040
<u>Activity by Type I multipliers</u>		
Gross Output	\$m	3287
Employment	\$m	20677
Value-Added	\$m	1655
<u>Activity by Type II multipliers</u>		
Gross Output	\$m	4691
Employment	\$m	28170
Value-Added	\$m	2357
Indirect tax	\$m	157
Value-Added + tax	\$m	2514
Survey sample size		6659

^Net of earnings, indirect taxes, used vehicles, and imports.

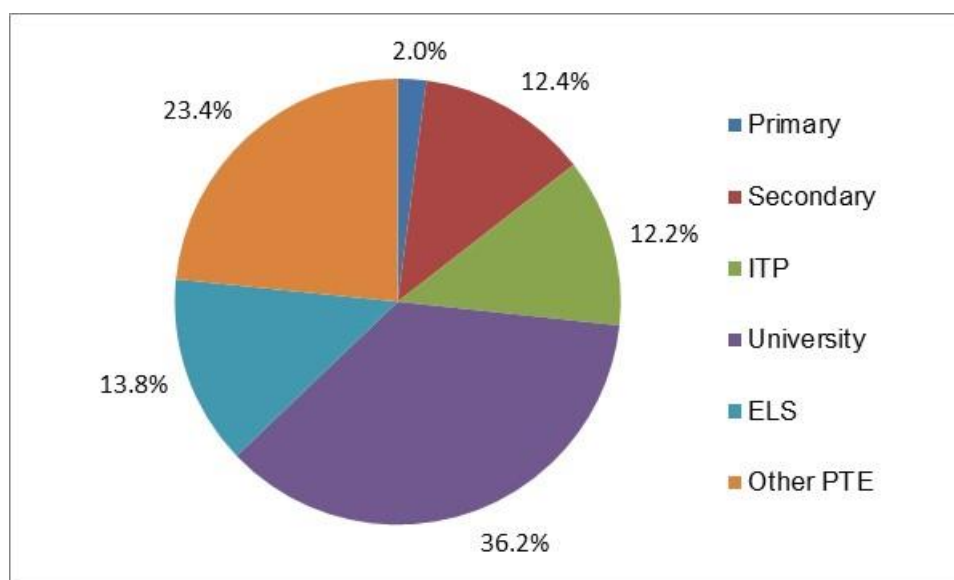
1. Total expenditure, encompassing tuition and living costs, is estimated to be \$2.49 billion. This figure includes spending that is financed by the New Zealand earnings of international students.
2. The contribution to GDP of international students is estimated at \$2.51 billion. This figure is calculated by starting with foreign exchange earnings; subtracting expenditure on indirect taxes (GST and excise duty), imports and used vehicles; re-allocating trade margins; applying economic multipliers to measure the flow-on effects of the net spending; and finally adding back the indirect taxes. Appendix B provides more information on economic multipliers.

Expenditure by international students in New Zealand directly generated just over 13,600 filled jobs. Adding on indirect and induced employment brings the total to 28,170 filled jobs, about half of which are in the education industry.

As shown in Figure 4.2 university students contribute over 36% of total gross output of onshore international education, followed by ELS students at around 14%. However, as the grouping of students by institution in Figure 4.2 is based on the type of institution that is mentioned first in the survey of expenditure, it is fair to assume that a significant share of the living costs of such students occurs after their course of study at an ELS. Classifying students who attend more than one type of institution is always somewhat arbitrary as they were not asked about the length of time spent at

each, let alone to apportion their expenditure. Some method of *ex post* apportionment might be possible, but on the other hand perhaps it makes sense to classify students by their first course of study in New Zealand, as without that they may not have stayed for subsequent study.

Figure 4.2: Expenditure by Education Sub-Industry



Sensitivity Test

As noted in Section 3, answers to survey questions have been excluded if they are more than five standard deviations away from the mean. Even with 10,000 observations for responses that are approximately normally distributed, it is very unlikely that even a single individual would have a legitimate answer that is that far from the mean. Thus we can be very confident that this filter removes large errors.

Arguably though it might still leave answers that are too high to be plausible. Reducing the upper limit to the mean plus three standard deviations would statistically be expected to pull back about 13 answers in a sample of 10,000. However, there is of course a danger that a high but legitimate answer is incorrectly excluded.

Nevertheless lowering the maximum to the mean plus three standard deviations instead of the mean plus five standard deviations, reduces total domestic spending from \$2.49 billion to \$2.32 billion. While this difference suggests that the results are robust in the context of the likely error margin on reported expenditure, a cut-off of three standard deviations is probably too tight, and thus the \$2.32 billion is not our preferred estimate.

Industry Comparison

With a gross output of \$2491m the onshore international education industry is similar in size to the Textile, Apparel and Leather industry and the Transport Equipment Manufacturing industry. It easily surpasses Seafood Processing and Local Government Administration. See Table 4.10

Table 4.10: Gross Output of Selected Industries

Industry	\$m
Seafood Processing	1618
Textiles, Apparel & Leather	2424
Pulp & Paper Production	2968
Ceramics & Non-Metallic Mineral Products	2277
Transport Equipment Mfg	2492
Local Government Administration	1601

Source: SNZ LEED data for year ended March 2011

With regard to employment, onshore international education is similar in size to Nursery and Floriculture Production and to the Motion Picture and Video industry – an industry which has a much higher public profile than international education. See Table 4.11.

Table 4.11: Employment in Selected Industries

Industry	Filled Jobs
Nursery and Floriculture Production	13,530
Coal, Oil, Gas and Metal Ore Mining	12,420
Professional and Scientific Equipment Manufacturing	12,860
Motion Picture and Video Activities	13,240
Financial Asset Investing	12,150

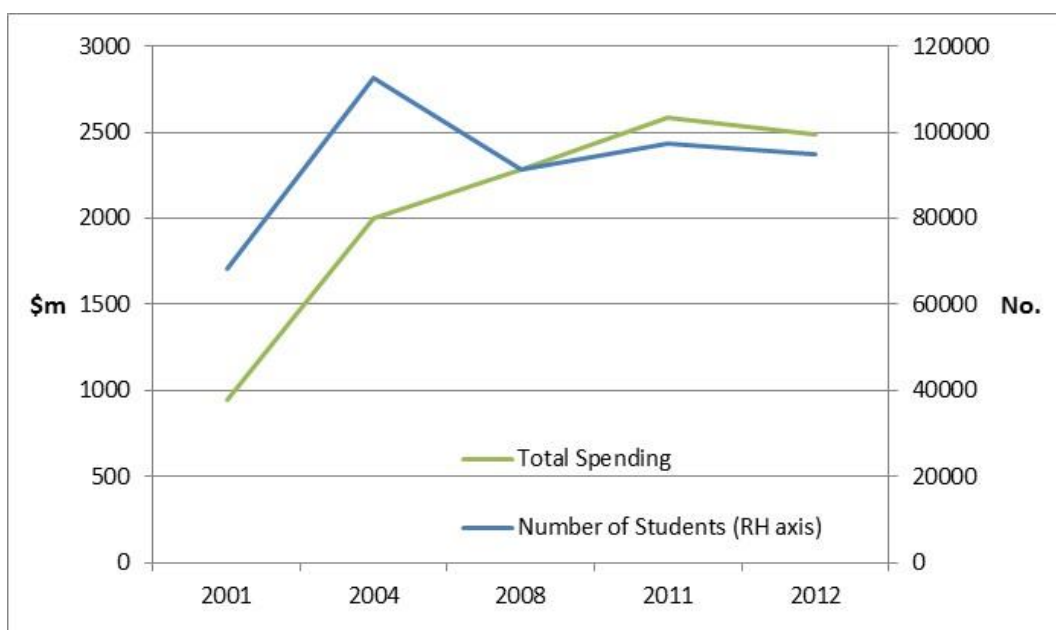
Source: SNZ. Data relates to year ended December 2011.

Historical Comparison

In 2007/08 total spending amounted to \$2327 million and the contribution to GDP was \$2039 million – excluding “Other” international students. Comparable figures for 2012/13 are \$2420m and \$2443m. Thus under both measures the onshore industry is slightly larger than in 2007/08. Total spending since 2001 is shown in Figure 4.3, with an estimate for 2011.

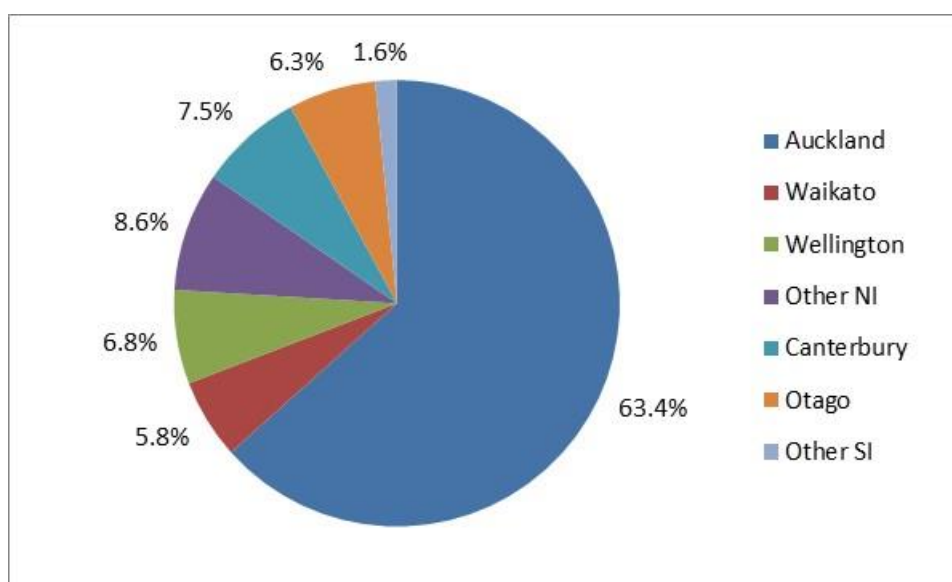
In 2007/08 direct employment was just under 12,800 although this figure relates to full time equivalent positions, not filled jobs. Accordingly the comparison somewhat flatters the 2012/13 estimate of 13,600 although, acting in the other direction, inflation over the five years would have reduced the number of jobs per dollar of spending by 5-10%.¹⁰

¹⁰ For 2007/08 total (direct plus indirect plus induced) employment was estimated to be over 32,000. This difference suggests that the shift from full time equivalent positions to filled jobs has had a significant effect on the multipliers, and/or that labour productivity has improved markedly in the industries that indirectly supply international education. It is also possible that previous conventions for calculating the full time equivalent of a part time position are no longer valid – and may not have been for some time.

Figure 4.3: Historical Trends (excl “Other” Students)

Expenditure by New Zealand Region of Study

Figure 4.4 presents the economic impacts of 98,182 international students by New Zealand region of study. Student spending in the Auckland region accounts for over 63% of national expenditure. This is up on the 2007/08 share of 54%.

Figure 4.4: Expenditure by New Zealand Region of Study

Theoretically the sum of the regional GDP effects should be less than the total GDP effect presented in Table 4.9. This is because any activity that leaks out of a given region to other regions in New Zealand is not picked up by the multipliers for that region. For example if a student in Wellington purchases wine that is made in Otago,

that spending represents leakage from Wellington, but it is not captured in the estimates for the economic effects of international education in Otago – which relate only to students who study in Otago. A lack of data on inter-regional trade flows prevents us from tracking such leakage between regions.

Table 4.12 shows the relative contribution of international education spending to GDP in each region. Note that the GDP data relates to 2010, the latest year for which figures are available. Unsurprisingly Auckland is the region that is most reliant on the industry, with international education accounting for 2.1% of its GDP. Otago follows with 1.7%. It is worth re-iterating that the industry's contribution in a region relates only to the spending of students in that region. That is, leakage from one region to another, such as a Waikato student buying furniture made in Auckland, is not picked in these figures. As shown at the bottom of Table 4.12, on a national basis such leakage amounts to 0.2% of GDP – the difference between the sum of the regional effects at 1.1% and the true national total effect of 1.3%.

Table 4.12: International Education Share of Regional GDP

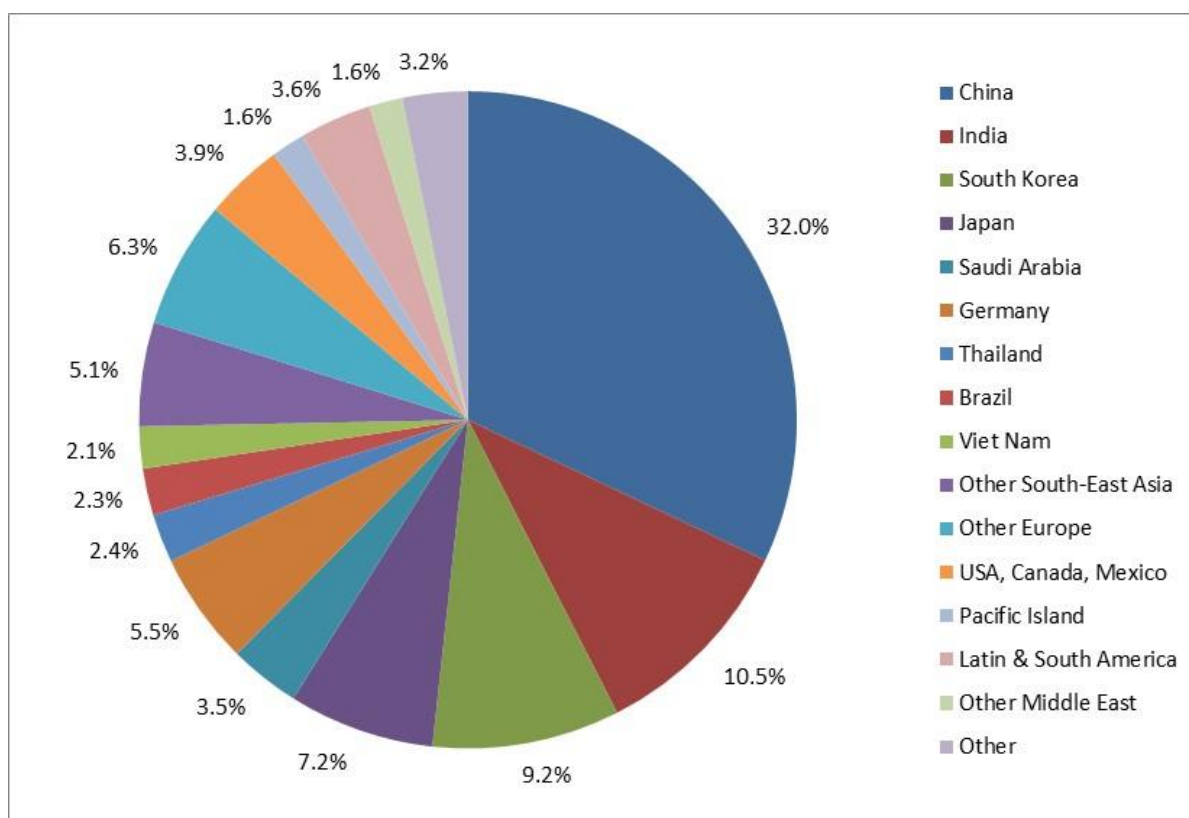
Region	GDP (2010) \$m	International Education \$m	International Education share
Auckland	66,347	1413	2.1%
Waikato	16,150	121	0.7%
Wellington	26,858	143	0.5%
Other North Island	38,010	175	0.5%
Canterbury	23,188	173	0.7%
Otago	8,270	139	1.7%
Other South Island	10,894	31	0.3%
Total above		2193	1.1%
Total NZ	189,717	2514	1.3%

Source: SNZ

Expenditure by Source Country/Region

The economic effects of the 98,182 international students by source country or region are shown in Figure 4.5.

Unsurprisingly China is the largest market, generating about one third of spending. In 2007/08 the Chinese share was only marginally smaller at 30%. The top four countries (China, India, South Korea and Japan) account for some 60% of total spending. As noted earlier, in 2007/08 India did not rank in the top three positions.

Figure 4.5: Expenditure by Source Country/Region

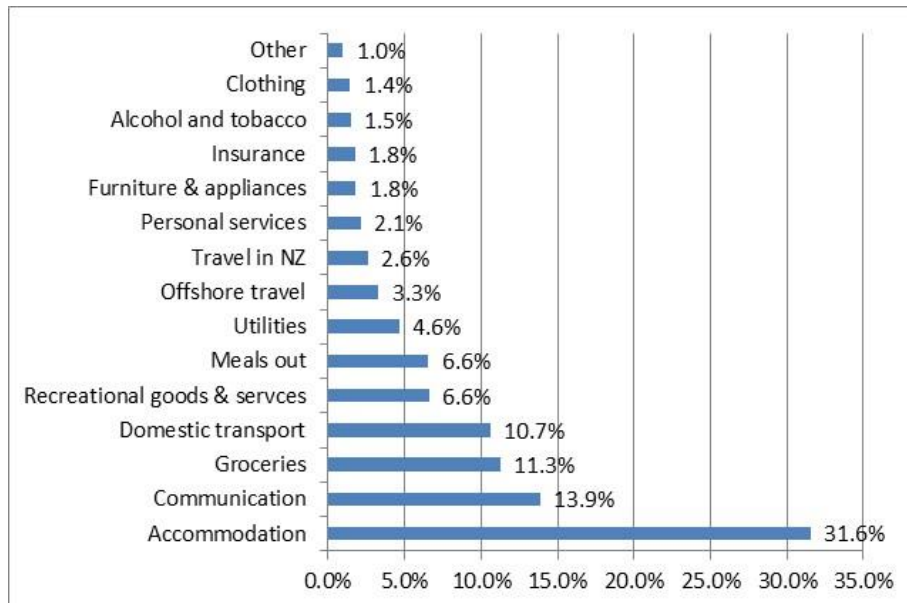
Expenditure by Category

There are two reasons for asking students to report their expenditure at a reasonably fine commodity level. Most importantly, experience has shown that the sum of individually estimated components is more accurate (even if each is measured with substantial error) than simply asking for an estimate of total expenditure. Secondly, it provides us with at least some basis to calculate economic activity multipliers that capture the different spending patterns of different students. For example Auckland students may spend more on accommodation than students in Waikato. However, these are generally second order effects.

So, while the survey was not designed to provide an accurate and detailed profile of expenditure, we can nevertheless obtain a reasonably valid picture of relative expenditure over broad commodity groups. This is illustrated in Figure 4.6. Average living cost expenditure is approximately \$17400.

Accommodation is by far the largest component of expenditure.¹¹ That plus communications account for almost half of expenditure. Grocery costs are the next highest component followed closely by domestic transport.

¹¹ An estimate of food and energy costs has been subtracted from home-stay and dormitory costs.

Figure 4.6: Composition of Student Expenditure

5. Offshore Provision of Educational Services

As discussed in Section 3 we sent out 55 surveys, securing 44 replies of which 33 had positive offshore income to report. Conceptually offshore provision includes the following activities:

- Offshore delivery of teaching and learning, both in short term packages or as whole or part degree, diploma or certificate programmes.
- Distance delivery of the above via electronic or correspondence means.
- Sales of curriculum, intellectual property, systems, software and learning materials.
- Contracts to bring foreign groups to New Zealand for education and training including 'edutourism'.
- Educational consulting and advisory work.
- Research and commercialisation of education goods and services
- Audit, moderation, assessment and quality control work.
- Hosting of study tours, delegations and familiarisation visits.

Consistent with Balance of Payments classifications, excluded are non-education business services such as consultancy, research and technology development, even if they are undertaken by (predominantly) educational institutions.

In the 2007/08 study the above activities had to be aggregated to only three categories for reporting offshore income. For this study we have eight categories.

Background data

The following data has been derived from Statistics New Zealand's 2011 Business Operations Survey, (BoS) international engagement section.

Table 5.1: Profile of Education and Training Industry

Category	No. Firms	BOC table
Firms in the Education and Training industry	768	1
- Received overseas income	146	44
- Provided services (mode 2-4)	143	45
- Received royalties from licensing, franchising etc	3	45
- Exported (mode 1)	69	1
- Produced services offshore (modes 3 and 4)	31	70

According to the BoS, the 146 firms that received overseas income earned \$27.6m in their last financial year up to August 2011. However, the sample frame for the BoS excludes the government sector which makes a difference: The Census of International Trade in Services and Royalties (CITSR) 2011 shows revenue from exports of Education and Training services of \$78m for the year ended June 2011.

The classification system used internationally distinguishes four modes of trade in services:

- Mode 1: cross-border supply such as when suppliers of services in one country supply services to consumers in another country without either supplier or consumer moving into the territory of the other.
- Mode 2: consumption abroad, describes the process by which a consumer resident in one country moves to another country to obtain a service.
- Mode 3: commercial presence, where enterprises supply services internationally through the activities of their foreign affiliates abroad.
- Mode 4: presence of natural persons, where the producer moves to the country of the consumer to provide the service.

As intimated above, deciding on what counts as offshore education and training services is somewhat arbitrary. Under the current System of National Accounts, revenue from the offshore use of curriculum material developed in New Zealand is classed as an export of educational services or perhaps as royalty income. If the material is sold it becomes an export of either printed or electronic matter, and is then no longer treated in the National Accounts as an educational service.

International students in New Zealand come under Mode 2. Thus educational institutions that enrol international students in New Zealand are likely to constitute a large share of the 143 enterprises that received overseas income by providing services. The offshore provision of educational services is primarily under modes 3 and 4, although most educational publishing is classified as mode 1.

Survey Results

Revenue from Offshore provision

Table 5.1 suggests that excluding the government sector, our list of offshore providers should have at least 34 names, although the number could be as high as 103 (3+69+31) if most of the mode 1 exporters are not exporters of goods – which is unlikely. The correspondence will not be exact as some smaller operations (six or fewer employees) are excluded in the BoS and some firms move in and out of eligibility in terms of receiving overseas income.

Excluding publishers and government owned educational institutions our list has 36 names. Including the other enterprise brings the total to 55. However, while it seems that we have not achieved 100% industry coverage, based on our interviews it is unlikely that any major players have been omitted (apart from educational publishers).

Following standard practice to preserve confidentiality, in the tables below each cell has at least three observations.

Type of Activity

Excluding educational publishing, total revenue from offshore provision is estimated to be at least \$83m – refer Table 5.2. That this is very close to the CITSR figure of \$78m – which also does not include publishing – confirms that we are unlikely to have

missed any large industry players, although there is a timing difference between the \$78m and the \$83m. Adding educational publishing raises the total to almost \$104m.

By far the largest type of activity is the provision of education services, although the distinction between education and teaching services, distance education, and training is unclear. The description of activities in the survey responses is made by the respondents themselves so one cannot be confident that the descriptions are consistent between respondents.

The three groups combined account for \$70m. Some will entail direct provision in the destination country and some will be through remote delivery.

Table 5.2: Revenue by Type of Activity¹²

Activity	2012/13	2007/08
	\$m	\$m
Education & teaching services	67.7	
Distance education	1.8	
Training	0.5	
Educational consulting	<u>8.4</u>	
Professional services	78.4	89.7
Royalties & license fees	3.6	3.3
Other (software, recruitment)	<u>0.8</u>	
	82.8	
Books and publishing	<u>21.1</u>	<u>14.0*</u>
	103.9	106.9

*Includes software for 2008.

By type of institution, universities contributed \$12.4m; institutes of technology, \$6.6m; and companies (other than publishers, but including all private and government training establishments), the remaining \$63.8m.

For 2012 we have identified books and publishing as a stand-alone category for two reasons. Firstly, while it is of interest to Education New Zealand, as noted above sales of books and other material are classified as exports of goods, not as exports of services. Including them means that the total value would be inconsistent with the \$78m from the CITSR. Secondly, our coverage of educational publishers is inadequate, so instead we note the results obtained by Annear (2013).¹³

In 2008 the revenue from offshore provision was estimated at \$107m. Educational services and consulting contributed \$89.7m; licences and royalties, \$3.3m; and software, including the sale of intellectual property such as books, \$14.0m. Given the

¹² Where institutions identified revenue from non-educational services, such as where a university earns income from scientific research, this has been excluded.

¹³ Annear, J (2013): *Educational Publishing Export programme - Interim Report*. Report for Publishers Association of New Zealand, on behalf of Education New Zealand.

error margin in surveying and volatility in year to year activity, one would have to infer that the size of the offshore industry in 2012 was very similar to that in 2008.

Costs

The survey also asked about the costs incurred offshore that were attributable to the generation of income from offshore education. This question was not satisfactorily answered, with a response rate of under 60%. For the smaller scale operations full accounting of revenue and expenditure is seemingly not common. Projects are developed and administered within existing management and accounting systems without a 'cost-centre' approach.

Hence we do not tabulate the results, although for those who did respond the average gross profit was approximately 24% of revenue. For 2008 the proportion was estimated at around 35%, although this figure is probably no more reliable than the 24%.

To be clear, the revenue statistics recorded in the BoS and CITSR are gross, as any costs incurred offshore would be classified as imports of goods or services.

Industry Concentration

Table 5.3 depicts a very skewed industry concentration with more than three quarters of the revenue earned by 10% of the enterprises (educational institutions, companies, ITOs etc) that reported at least some revenue. Over 90% of the revenue earned is by about 25% of enterprises.

**Table 5.3: Revenue Bands by Enterprises
(excluding publishing)***

Revenue	No.	% of \$
≤ \$50,000	5	0.1
> \$50,000 & ≤ \$100,000	5	0.5
> \$100,000 & ≤ \$250,000	6	1.3
> \$250,000 & ≤ \$500,000	4	1.5
> \$500,000 & ≤ \$1m	4	3.6
> \$1m & ≤ \$5m	5	16.3
> \$5m	<u>3</u>	<u>76.6</u>
	32	100.0

*Only one company does solely publishing, reducing the sample size from 33 to 32.

However, the 10% and 25% would be slight over-estimates if our sample under-count consists primarily of minor players.

Markets

Table 5.4 shows where offshore revenue is earned. Two regions dominate; the Middle East (including Saudi Arabia) and Asia which account for 39% and 45% respectively. Confidentiality provisions prevent us from further disaggregating the Other Middle East and Other Asia categories.

**Table 5.4: Revenue by Country or Region
(excluding publishing)**

Country/Region	\$m	Count
Saudi Arabia	9.6	5
Other Middle East	22.8	5
United States	4.9	10
Australia	4.1	13
Malaysia	3.0	5
China	2.0	7
Singapore	1.1	4
Other Asia	30.7	14
Pacific Islands	1.3	16
Other	3.3	31
	82.8	110

Other Survey Results

Barriers

The survey asked about perceived barriers to increasing revenue from the offshore provision of educational services. Responses are summarised in Table 5.5. We make no judgements as to whether the comments are justified.

As the questions were open-ended any summary involves balancing the need to combine similar responses with maintaining differences in emphasis. For example there were five respondents who mentioned competition from other foreign providers and two who mentioned the high cost of servicing foreign markets due to New Zealand's remoteness. Arguably the latter is a subset of the former.

Obtaining funding for expansion and start-up, and the effect this has on cash-flow, is seen as the most significant barrier to increasing revenue from offshore provision. This is a supply-side barrier, as is the complementary issue of marketing and promotion capability. Other highly ranked supply-side issues are problems in dealing with NZQA, covering issues such as mutual recognition of qualifications between countries and slow response times; a poor commercial mind-set by universities; and attracting and retaining professional staff offshore.

Demand-side barriers are fewer. Competition from other offshore providers is type main one, along with (though not unrelated) customer and partner ability to pay.

Growth 2013-2015

While not asking for details, the survey did request information on the general level of offshore activity over 2013-2015 specifically.

Interestingly, in spite of the perceived barriers to growth, no institution expected a reduction in activity over 2013-2015. See Table 5.6. However, there were a number of non-responses to this question, which could be more likely amongst those with low expectations about future growth.

Ten institutions expected strong growth over the three years (at least 20% if quantified and frequently more), with another thirteen expecting some growth. Of course this does not negate the relevance of the perceived barriers, without which growth might be even faster.

Table 5.5: Summary of Perceived Barriers to Expansion

Barrier	Count
Funding for expansion and start-up costs, associated cash flow	12
Promotion and marketing capability, sales staff, opportunity cost of allocating staff to such tasks and offshore administration	9
Competition with other foreign providers & subsidies from their governments	5
NZQA difficulties: recognition of offshore qualifications, requirements for offshore delivery, slow, uninformed staff	5
Poor commercial mindset & lack of educational service innovation by universities	4
Attracting and retaining staff	3
Customer ability to pay	3
Poor collaboration amongst NZ providers	3
Language and cultural difficulties	3
Offshore partners with financial difficulties	2
NZ remoteness and associated high cost to service foreign markets	2
Establishing new customer relationships	2
Need for local presence v remote delivery	2
NZ not seen as value for money – government needs to promote quality	2
Lack of direction and support from ENZ and government	2
Scarcity of local partners	1
Poor offshore educational frameworks	1
Corruption in offshore markets	1
Moving from supply driven to demand driven business model	1
Use of IT	1
Low margins	1
Local bureaucracy offshore	1
Repatriation of offshore earnings	1
Protection of intellectual property	1
Brand recognition	1
NZ government attitude to private training establishments	1
Subsidies to government institutions	1

Table 5.6: Expected Level of Activity 2013-2015

Growth	Count
Strong growth	10
Some growth	13
Essentially flat	3
Reduction	0

Other Comments

Respondents were free to provide other comments, although most did not. The following points were noted.

Table 6.7: Miscellaneous Comments

Other comments
Government could assist with managing investment risk
The NZTE Beach Heads programme has been helpful
Better links with ENZ and NZTE to identify opportunities
Sector has poor leadership, investment and communications
NZTE good but high in information requirements
Sector needs a new business model
Foreign students in NZ need to show \$15,000, so offshore looks better
Market gap in high volume, low price segment

Offshore provision as marketing

Some educational institutions are involved in joint ventures with offshore partners, whereby they deliver or approve courses offshore as part of a New Zealand qualification for which the students must come to New Zealand to complete.

In some cases the students are enrolled with the New Zealand provider from the start of their study, while in other cases the joint venture just uses the New Zealand provider's curriculum and/or moderation services. Another arrangement is where a New Zealand educational institution accepts passes in foreign courses as satisfying pre-requisites for study in New Zealand.

For the overseas based component of the study students usually pay a fee to the joint venture or foreign provider, which is used to cover costs in the foreign country. There is no income (and no surplus) accruing to the New Zealand institution and indeed the associated financial flows do not appear in their accounts.

The financial gain to the New Zealand institutions occurs when the students come to New Zealand to complete their qualification and pay the usual international student fees.

This synergy between offshore and onshore provision could potentially confound the measurement of each sector's performance against Education New Zealand's growth targets. Although the foreign exchange earnings from international students studying in New Zealand clearly belong in the onshore provision category, arguably they would not exist (or be smaller) without the complementary offshore activity. In this sense the offshore activity is analogous to offshore marketing and advertising, but with zero cost.

Other Growth Issues

The emergence of Massively Open Online Courses (MOOCs) rather changes the education landscape for New Zealand tertiary education providers.¹⁴

If students can obtain passes or credits for papers available online through well-known international providers such as MIT and Wharton, albeit without (at this stage) actually being awarded a degree from such institutions, would they still want to pay fees for the full three years to New Zealand providers – whether offshore or onshore?

The joint venture scenario (as discussed above) where students take some qualifying papers in their home country and then come to New Zealand to finish off their degree, might compete head-on with a scenario where the initial component is replaced with papers delivered via MOOCs. This may involve New Zealand providers recognising the MOOC courses of high profile international providers.

There is also competition at the secondary school level, with brand name British private schools setting up satellite operations (franchise partnerships) abroad in countries such as Thailand, China, South Korea, Singapore, Kazakhstan and Qatar. Students sit the international GCSE or International Baccalaureate, often in preparation for university study abroad.

With the market for those with the ability to pay top dollar becoming crowded, schools are looking to new markets (such as Chile and Mexico), changing their business model by entering into sponsorship and partnership arrangements with local schools, and even moving into the provision of primary education.¹⁵

¹⁴ Source: *The Economist* December 22 2013. <http://www.economist.com/news/international/21568738-online-courses-are-transforming-higher-education-creating-new-opportunities-best>

¹⁵ Source: *The Economist*, May 4th 2013.

6. Follow-up research

Living Cost Survey

The living cost survey dataset presents a number of possibilities for further analysis:

1. Respondents were asked about the extent to which they used spending records to answer the questions. It would be interesting to see if there is any relationship between the use of records and total reported expenditure, thereby providing some insight into reporting error.
2. Students were asked about their intention to travel to their home country during the year. We have not extrapolated spending on travel to include intended travel, but this could constitute an interesting sensitivity test.
3. The timing of the survey at the start of the academic year for most students means that for new students (as opposed those continuing from the previous year) some expenditure on large items could be missed. How big an impact does duration of stay in New Zealand prior to the survey affect aggregate expenditure on large items such as home appliances?

Future Surveys

To a large extent inadequate coverage of short-stay students is handled by post-weighting the survey results using known student numbers and knowledge about institution of study – as a proxy for course duration, but this is imperfect. A better option would be to undertake a separate survey of short-stay students that is staggered over a twelve month period.

Onshore v Offshore

Accurate measurement of offshore provision may require more detailed surveying by Statistics New Zealand as it is clear that some players in the industry are not prepared to divulge data, even to an intermediate party at arms-length from Education New Zealand, and even with assurances of confidentiality.

Also, it is clear that the distinction between onshore and offshore provision is not always helpful. While most offshore provision activities do directly generate foreign exchange earnings, some are used as a means of raising onshore provision. As such it would be useful to know the number of international students who come to New Zealand via such mechanisms. Of course one could not necessarily assume that student numbers would be lower by that amount had the offshore activity not occurred, as some may have come anyway, while other students might be attracted by different forms of marketing. Nevertheless even an approximate attribution would help to illustrate the benefits of continuing with that particular kind offshore activity.

General Equilibrium Analysis

Given the size of the international education industry at around \$2.6 billion, it is easily large enough to be examined within a general equilibrium model. This would provide a more reliable analysis of the industry's economy-wide effects at the national level than standard multiplier analysis – as outlined in Appendix B.

Appendix A: Reconciliation of Estimates

The international education industry has no clear definition. The Ministry of Education does not categorise international PhD students as full fee-paying students as they pay the same fees as domestic students – there are no specific foreign fees.

With regard to offshore provision, educational publishing is categorised in the Balance of Payments as exports of goods (such as books), not exports of educational services.

Table A1 reconciles the key dollar values from the preceding chapters.

Table A1: Reconciliation of Gross Output (\$m)

	Ministry of Education	BoP Education	ENZ
<u>Onshore activity</u>			
International “full fee-paying”	2309		2309
PhD students		97	97
Other international students (some)		85	85
<u>Offshore activity</u>			
Services, royalties etc		83	83
Publishing			<u>21</u>
Total			2595

Appendix B: Economic Impact Analysis

The economic contribution of an industry does not mean that the economy is better off by the full amount of the measured contribution. This would only be true if all of the resources involved in supplying the needs of that industry would otherwise lie idle. This is unlikely.

The Multiplier Concept

Each dollar spent on the output of one industry leads to output increases in other industries. For example for a university to deliver education services to an international student it requires inputs of books, energy, communication services and so on. Part of the tuition fee is used to cover the cost of these items. Another part covers the cost of the buildings and equipment (spread over their useful lives) and there is a large portion for staff wages and salaries.

The supplying industries such as energy require inputs themselves, pay wages and salaries, and so on. The effect on these supplying industries is known as the upstream or indirect production effect and is commonly measured by a number called a Type I multiplier which is defined as the ratio of the direct plus indirect effects, to the direct effect.

The supplying industries pay wages and salaries, which are used to purchase household consumption goods. This effect is generally known as the downstream or induced consumption effect. Again the effect may be measured by a multiplier. The total or Type II multiplier is defined as the direct, plus indirect production, plus induced consumption effects, all divided by the direct effect.

Multipliers are typically calculated for three different measures of economic activity:

- gross output
- value-added
- employment

Each of these is further disaggregated into Type I and Type II multipliers.

However, multipliers need to be cautiously interpreted and carefully applied. When applied to gross output they lead to double counting. For example the value of food and drink supplied at a restaurant is counted as part of the gross output of both the Food and Beverage Manufacturing industry and the Restaurant industry. If one's aim is to measure overall business activity this double counting may be useful, but from the perspective of economic contribution it is value-added, or contribution to gross domestic product (GDP) which is of interest.

Link to National Accounts

At this point one needs to be mindful of the definition of value-added and of the income-expenditure identity in the national accounts. If an international student

spends \$100 in New Zealand, that \$100 is part of exports which is a component of final demand - the expenditure side of GDP. In this sense it represents 100% value-added. On the income side, however, only the part which is not spent on inputs from other industries is counted as direct value-added. The rest is progressively spent and re-spent upstream and, apart from spending on imports, is eventually entirely exhausted on inputs of labour and capital; that is value-added.¹⁶ Thus the multiplier for the indirect upstream effects is just a representation of the process whereby the expenditure and income sides of the national accounts equilibrate. No additional value-added is created from this effect. All that we gain is knowledge about how the initial expenditure shock ripples through the various supplying industries and how much leaks offshore in the form of imports.

The more powerful effect is that of the induced consumption multiplier. The initial wage and salary payments and the subsequent rounds of wage and salary payments lead to an increase in private consumption; another component of final demand. This generates flow-on effects in an analogous manner to the original increase in exports and therefore does generate an additional gain in GDP. This gain may be legitimately attributed to the increase in exports, provided that resources have not been diverted from other productive uses. If they have, it is necessary to deduct the direct, indirect and induced effects of those resources in their alternative uses.

Determination of Multipliers

Multipliers for the indirect production effect are easily calculated from standard input-output tables produced by Statistics New Zealand. Thus for a given increment to final demand (exports, consumption etc), we can determine the direct and indirect pattern of production needed to support that increment to final demand.

Consumption induced multipliers are more complicated to determine as they require some assumptions about the links between the Production Account and the Income & Outlay Account in the national accounts. In particular a link between private consumption (mostly household spending) and income from wages and profits needs to be established. Typically this is accomplished by treating inputs of labour as an intermediate input and then treating private consumption as the industry which produces labour. Enhancements to this approach include allowing for the distribution of operating surplus to households and for the leakage of household savings. This is the essence of the approach used by Butcher Partners (whose multipliers we use) to calculate the induced consumption multipliers.

Other enhancements are possible:

- allowing for consumption financed from social welfare benefits;
- including the effect of government consumption, much of which, such as health, is actually consumed by individuals and paid for out of taxes;
- including the effect of new investment which may be needed to expand output and may be financed out of operating surplus;
- acknowledging that exports may need to rise to finance the requirement for additional consumer imports.

¹⁶ In fact value-added also includes some forms of indirect taxation.

Accounting for all of these effects requires the use of a multi-industry general equilibrium model. These types of models incorporate all of the main inter-dependencies in the economy, such as flows of goods from one industry to another, plus the passing on of higher wage costs in one industry into prices and thence the costs of other industries. They also ameliorate most of the other implicit assumptions that are commonly overlooked in the application of multipliers derived from static input-output tables, notably:

- not assuming that all factors of production are in excess supply,
- allowing for price changes (such as if a factor is in limited supply) which may lead producers to change inputs, thereby altering their production structure and hence the associated economic multipliers,
- not forcing average relationships to hold at the margin,
- automatically calculating net multiplier effects by reducing the gross effects to the extent that they pull resources out of other productive uses (that is, trade diversion).

All of these effects have the potential to undermine the result of multiplier analysis - the wider the attempted coverage of indirect and induced effects, the greater is the potential for miscalculation and error. Rather like a stone thrown into a pond; the more the ripples spread out, the more likely they are to encounter some form of obstacle - ripples from another stone, a cross current, the embankment.

Given the size of the international education industry general equilibrium model analysis of the industry's wider economic impacts would seem worthwhile.

Appendix C: Offshore Survey



Survey of Offshore Provision of Educational Services

(on behalf of Education New Zealand)

We seek information on the fees received for the offshore provision of educational services, encompassing activities such as: consultancy and advisory work, education delivery via correspondence, a commercial presence in a foreign country, teachers temporarily located abroad, royalty income, and sales of software and intellectual property. Other activities may be relevant too.

Please complete the following tables for a recent 12 month period. Answers rounded to the nearest thousand dollars will be fine. Responses will remain confidential to NRB and Infometrics, and will be aggregated such that no published data will be able to be associated with a particular entity. We are happy to have responses by post if you prefer. If you have any questions please do not hesitate to contact us as detailed below.

Name of Entity:

Contact person:

Email:

Telephone:

12 month period to which data relates:

Category of service, royalty or activity	Country	Revenue from offshore	Expenditure incurred offshore
	1	NZ\$	NZ\$
	2	NZ\$	NZ\$
	3	NZ\$	NZ\$
	Other	NZ\$	NZ\$
	Total	NZ\$	NZ\$
Category of service,	Country	Revenue from	Expenditure

royalty or activity		offshore	incurred offshore
	1	NZ\$	NZ\$
	2	NZ\$	NZ\$
	3	NZ\$	NZ\$
	Other	NZ\$	NZ\$
	Total	NZ\$	NZ\$

Category of service, royalty or activity	Country	Revenue from offshore	Expenditure incurred offshore
	1	NZ\$	NZ\$
	2	NZ\$	NZ\$
	3	NZ\$	NZ\$
	Other	NZ\$	NZ\$
	Total	NZ\$	NZ\$

Please add more panels as required.

What do you see as the main barriers to increasing revenue from the offshore provision of educational services?

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In general terms, what levels of activity are you projecting for 2013 – 2015?

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Please add any other comments that could help us to interpret the information that you have supplied.

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