INTERNATIONAL STUDENTS AT CURTIN UNIVERSITY: THEIR IMPACT ON THE WESTERN AUSTRALIAN ECONOMY

A.M. Dockery
Institute for Research into International Competitiveness, Curtin University of Technology, G.P.O. Box U1987, Perth, WA 6001, Australia.

M. Thorpe
School of Economics and Finance, Curtin University of Technology, G.P.O. Box U1987, Perth, WA 6001, Australia.

P. I. Haslehurst
School of Economics and Finance, Curtin University of Technology, G.P.O. Box U1987, Perth, WA 6001, Australia.

ABSTRACT In this study the economic contribution to the Western Australian economy from international students studying at Curtin University of Technology is assessed. Overall, it is estimated that the 1,957 international students attending Curtin in 1994 contributed $42.5m in direct expenditure to the State economy. The inclusion of indirect or flow-on effects increases the contribution to $54.5m which is equivalent to increasing state product by 0.12 per cent and generating approximately 1000 jobs.

1. INTRODUCTION

Economic benefits that flow to a region from the presence of a local university are both many and varied. While some of these benefits are directly quantifiable, others are somewhat intangible. Analysis of benefits accruing to a region through increased expenditure and income multiplier processes and the resultant employment opportunities are relatively well documented. See, for example, Bleaney, Blinks, Greenaway, Reed and Whynes 1992, Fowkes 1983, and Brownrigg 1973. Intangible benefits such as the social return to education associated with the presence of a local tertiary institution whilst important, are difficult to isolate and quantify.

Tertiary education has become a major export market that is expanding rapidly along with many other services. It is estimated that the number of foreign students studying outside their home country at the post-secondary level is now in excess of 1.5 million (Kemp 1995). In Australia, international fee paying students have become an important part of the funding base for many universities. Consequently, a significant economic benefit accruing to a region from universities is that generated from the presence of international students. In an Australian context,

given the dramatic rise in the number of these students over the last five years, this is particularly so. This study undertakes an assessment of the impact of the international student presence at Curtin University of Technology, Perth, on the Western Australian regional economy during 1994[1].

Between 1991 and 1996 the number of foreign students studying at Curtin University increased almost three-fold to 4,212. The income from tuition fees from these students as a percentage of total University income increased, over the same period, from 6.2 per cent to 12.6 per cent. Beyond this immediate impact, however, is the injection of funds into the regional economy by students as a result of total spending in the region during the course of their studies.

The focus in this study is limited to directly quantifiable effects. Positive externalities, such as the contributions to future business and research activities due to the personal and academic interactions of local university students and staff with foreign students, as well as the social and cultural contributions to the community, are difficult to quantify and are not captured. To this extent, the economic impact of international students estimated in this study will understate the full contribution to the community.

In the following section the importance and size of the demand for education services is discussed. The methodology, including the data source is presented in Section Three. The composition of the expenditure directly attributable to overseas students is discussed in Section Four. The total direct and indirect contribution of overseas students to the Western Australian economy is expounded in Section Five with conclusions presented in Section Six.

2. DEMAND FOR EDUCATION SERVICES

Rising expectations and average income levels within developing countries in East Asia have stimulated a strong demand for higher education. This is reinforced by the demands of the fast growing economies undergoing considerable industrialisation and structural change. Moreover, the policy focus in these economies was for government to actively support primary and secondary education (World Bank, 1993).

Increasing demand for higher education by students in East Asia coupled with a growing interest in these markets by international providers of education has meant that the flow of post-secondary students from developing countries to developed countries has now become a significant international trade issue and a source of considerable export income for many developed economies. Whilst traditionally, students in East Asia tended to go to the United Kingdom or the United States for their tertiary studies, the growth in demand together with increasing competitiveness on the supply side has seen other countries, such as

[1] This paper uses data collected for an internal study undertaken by Curtin University. Consequently, it is not possible to discuss the economic effects of overseas students attending other Universities in Western Australia.

Table 1. International Students In Australia

	Total Overseas Students in Australia (Number)	Growth Rate of Overseas Students in Australia (per cent)	Total Asian Students in Australia (per cent)
1986	2 186		1 666 (76%)
1987	7 131	226.2%	6 624 (93%)
1988	21 118	196.1%	19 783 (94%)
1989	32 198	52.5%	29 940 (93%)
1990	47 065	46.2%	43 171 (92%)
1991	47 882	1.7%	43 696 (92%)
1992	52 540	9.7%	45 077 (86%)
1993	63 013	19.9%	53 653 (85%)
1994	69 819	10.8%	59 200 (85%)
1995	80 722	15.6%	68 125 (84%)

Source: DEET (1995)

Australia, gain a growing share of this market.

Globally, it is estimated that the total number of foreign students studying outside of their home country at the post-secondary level is currently over 1.5 million (Kemp, 1995). Blight (1995) estimates that this number will increase to 2.8 million in the year 2010 and to 4.9 million by the year 2025. Of these students, Australia currently attracts around 4 per cent compared to less than 2 per cent in the mid 1980's. It is evident that Australia has emerged as a serious competitor to the more traditional education exporters. The current trend is predicted to continue, with Australia's share expected to increase to 5 per cent in the year 2000 and 7.5 per cent by the year 2010 (Blight, 1995). This follows from a number of factors lowering the attractiveness of the traditional providers. In particular, Australia is very competitive in terms of the overall cost of acquiring an education. This includes not just fees, but also general living costs. Australia is also perceived as having a generally stable domestic environment and attractive lifestyle, while also being in close geographical proximity to many East Asian countries.

Enrolments of overseas students in Australia since 1986 are shown in Table 1. Between 1988 and 1995 the number of overseas students in Australia increased nearly fourfold, representing an annual average increase of 21 per cent. Of these students, currently 84 per cent are Asian. This is significant as Asian students in 1992 accounted for around 43 per cent of total world demand. It is estimated that this proportion will increase to 50 per cent by the year 2010 and 59 per cent by the year 2025 (Blight, 1995).

Of particular interest in this study is the benefit of international student expenditure to the regional and national economy of the service provider. With respect to Australia's economy, export income from overseas students has increased from $542 million in 1988 to nearly $2.3 billion in 1994/95 and is expected to reach $4.0 billion by the turn of the century (Australian Bureau of

Table 2. International Students In Western Australia

	International Students in Western Australia (per cent of total students in Australia)	International Students attending Curtin University (per cent of state)
1988	1 263 (6%)	693 (55%)
1989	2 324 (7%)	1 027 (44%)
1990	3 119 (6%)	1 293 (41%)
1991	3 667 (8%)	1 465 (40%)
1992	4 187 (8%)	1 831 (44%)
1993	5 200 (8%)	2 490 (48%)
1994	5 381 (8%)	2 897 (56%)
1995	6 659 (8%)	3 382 (51%)

Source: DEET (1995) and Statistics Office, Curtin University.

Statistics, Cat No.5302.0). In 1994/95 this income accounted for 11 per cent of Australia's total service exports.

On a regional basis, as shown in Table 2, Western Australia currently attracts just under 10 per cent of the total international student population studying in Australia. Of these, just over 50 per cent attend Curtin University of Technology.

3. METHODS AND DATA SOURCES

In line with accepted economic impact assessments the approach followed in this study is first to identify the economic activities associated with overseas students studying at Curtin University. These activities are then ascribed magnitudes in economic terms so that estimates of the direct contribution of Curtin's overseas students to the local economy can be obtained. Finally, appropriate multipliers are applied to derive estimates of the total economic impact (that is the sum of the direct and indirect, or flow on, effects).

The data used in this analysis was derived from financial reports and statistical records provided by Curtin University of Technology and from a survey of students at Curtin's metropolitan and rural campuses in Western Australia. This study focuses only on students who were living temporarily in the state in order to undertake studies at the university. The number of interstate students was not significant in the context of this study. Estimates of international student spending

are derived from the results of student surveys conducted in late 1994[2].

From the various data sources it is possible to determine the overall extra spending generated in Western Australia by these students. Since these direct expenditures also have flow-on or indirect effects, multiplier analysis is used to capture the total spending response (i.e. both these direct and indirect effects) arising from the initial direct injection (Clements and Ye, 1994). When money is spent by one economic agent, much of this spending then becomes income for other economic agents, who in turn spend this income and so on. In this way, the injection of one dollar of direct spending into the economy generates a flow-on effect in which the resulting increase in spending or output throughout the whole economy is considerably greater than the original one dollar. How great the flow-on effects are, depends on the leakages from the system for each round of spending, such as through taxation, savings or payments for imports.

The flow-on effects are estimated through the use of multipliers. These are derived from input-output tables which describe the value added as inputs are transformed into outputs, for various industry groups. They show the flow of goods and services between industries and to the various categories of final demand (consumption, exports, etc.). The approach assumes that fixed amounts of given inputs are required to produce a given output. The most recently available multipliers available at the time of the study were derived from the 1984-85 State input-output tables for Western Australia for each of 24 industry categories. Type 1 income multipliers which measure the amount of income that is generated by a change in final demand are employed for this analysis. Since this approach does not seek to include further rounds of spending generated from the initial injection, the total effects estimated in this study will underestimate the overall impact.

Several limitations can be identified with this methodology. It often takes several years to complete a set of input-output tables because of the data demands and the complexity of the tasks involved. Moreover they tend not to be done on a regular basis, particularly at individual state level. However, given that technological change in many industries is not that rapid, it is possible to obtain reasonable estimates of multiplier impacts even though tables used are some years old. Input-output analysis also focuses solely on the production side. Impacts on prices, wages, labour supply and the like and feedback effects of these changes on the economy are ignored. Such effects can only be incorporated using full computable general equilibrium models of the economy.

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[2] The "stock" figure of enrolments of international students at the time of the survey was 1,957. Stock enrolments, rather than gross enrolments for the whole of 1994, were used as the estimated student population. This misses students who completed their studies in first semester of 1994 but avoids an upward bias in the sample estimate of student spending. Clearly, spending is likely to be lower for these students as they will, on average, have spent less time in Western Australia in 1994. Therefore the conservative approach of using the stock figure was adopted.

Table 3. International Students: Direct Educational Expenses

	Average per Student	Aggregate Estimates (No. students = 1,957)
University Fees	$9,790	$19,159 500
Guild Fees	$134	$262,800
Textbooks and Materials	$386	$754,800
Computer	$739	$1,446,4300
Parking Fees	$22	$42,400
Fares	$800	$1,566,100
TOTAL EXPENDITURE	**$11,871**	**$23,232,000**

4. ESTIMATES OF DIRECT EXPENDITURE BY INTERNATIONAL STUDENTS

For the purposes of this study three categories of spending are considered; education expenses, living expenses and visitor expenditure. The survey questionnaire instructed students to include only expenditure made in Western Australia. Consequently all expenditure in Western Australia by overseas students is considered incremental to the State economy. Details of direct education expenses attributable to these students are shown in Table 3.

In addition to the direct expenditure by international students on their education, the local economy also reaps the benefits of any other student spending while they are living in this State. Therefore, living expenses for the period in which they were in Western Australia were also included. To estimate aggregate living expenses over the year, students were asked to detail their average weekly spending whilst residing in Western Australia, and also how many weeks of the 1994 calendar year they would spend in Western Australia. These figures are shown in Table 4.

Another local benefit arising from the presence of international students is the expenditure created by friends or family who come to Western Australia to visit them during their studies. To quantify this expenditure, these students were asked if any friends or family came to visit them in Western Australia who would not have done so if the respondent was not studying at Curtin. Those who had visitors during 1994 were further asked to estimate the number of visitor nights spent in private and commercial accommodation during the visitor's stay(s). Estimates from the Western Australian Tourism Commission Monitor (1992) of average expenditure per visitor night for visitors staying in commercial and private accommodation in Western Australia was used to translate the number of visitor nights into expenditure aggregates. These figures are broken down by categories representing the visitors' "main purpose of visit". Appropriately, we use the figures for visitors whose main purpose of visit was to "visit friends/relatives". Aggregate expenditure shown in Table 5 was calculated by multiplying these

Table 4. International Students: Weekly Living Expenses

	Average Weekly Eiving Expenses	Aggregate Estimates (per annum)
Rent or board	$63.10	$5,223,500
Groceries	$34.97	$2,894,900
Restaurants, pubs/hotels	$22.73	$1,881,600
Other Entertainment	$17.66	$1,461,900
Petrol/car maintenance	$17.18	$1,422,200
Transport (bus, train etc.)	$4.30	$356,000
Communications (phone, fax, etc.)	$25.25	$2,090,200
Utilities (electricity, gas, water)	$11.21	$928,000
Insurance (health, car etc.)	$8.52	$705,300
Other	$12.11	$1,002,500
TOTAL EXPENDITURE	**$217.03**	**$17,966,000**

Notes: Average weeks spent in WA = 42.3, Number of students = 1,957

Table 5. International Students: Visitor Expenditure

	Per Commercial Visitor Night	Per Private Visitor Night	Aggregate Due to Visitors
Accommodation	$17.88	$1.74	$211,200
Food/drink	$12.55	$6.47	$267,100
Day tours	$2.01	$1.10	$44,200
Transport	$5.97	$2.51	$114,200
Air fares	$32.49	$24.52	$867,400
Shopping	$6.82	$13.58	$373,000
Entrance fees	$0.63	$1.81	$47,000
Sport	$0.15	$0.27	$7,600
Other	$10.15	$14.57	$427,400
TOTAL EXPENDITURE	**$88.65**	**$66.57**	**$2,359,100**

average expenditures by the number of visitor nights derived from the survey responses. International students at Curtin University in 1994, were responsible for generating 9,609 nights accommodation in commercial establishments (ie hotels, motels etc) and 22,642 nights in private residences. This equates to an average of 4.91 visitor nights in commercial accommodation and 11.57 private visitor nights per student.

Many students work while studying at university, particularly in part-time jobs. The survey results indicate that around 32 per cent of international students earned income from work undertaken within WA. The average earnings across all

students was $520, implying aggregate earnings of just over $1 million. For international students, any income earned will contribute towards their weekly living expenses and those incurred in undertaking their studies. It may be argued that any income earned by these students in WA should be deducted from their total spending, as it is only the difference between their spending and earnings that is a net inflow into the State economy.

There are also grounds for arguing that this income need not be deducted, or at least not in full. Any expenditure by international students represents economic stimulus to the State economy. The fact that some of this spending is earned from within the State, rather than transferred in, does not represent a loss to the State since the value of work done by students can be seen as equivalent to the income earned if one accepts the classical assumption that workers are paid their marginal product. The conditions under which it would be justified to fully discount income earned would be (a) that all jobs taken by international students would otherwise have been taken by local residents and (b) expenditure by these "displaced" local residents is lower, by the full amount of the earnings, than it would otherwise have been. Full displacement of local workers may not occur over the medium to long term since regional wages may fall, and hence labour demand increase, as a result of the expansion of the labour supply in the form of international students. While any one international student may only be available for work for a short period, the presence of a significant pool of international student labour is a long run phenomenon. Finally, given the replacement rates inherent in income support arrangements and the nature of consumer spending, it is not clear that spending by local residents would be much lower because they have missed out on jobs "taken" by non-domestic students.

It would certainly be the case that in discounting students' aggregate expenditure for earned income the decrease should be considerably less than the full amount of the earned income. However, in the absence of a firmer guide to the rate at which such discounting occurs, the conservative approach of full discounting is adopted.

5. TOTAL ECONOMIC EFFECT OF OVERSEAS STUDENTS

By aggregating the three categories of expenditure, international students' total direct expenditure is estimated to be $42,538,600 (Table 6). Discounting for earned income is incorporated by reducing the estimate for living expenses. This does not include indirect effects. These flow on effects are incorporated by allocating the direct expenditure to input/output industry categories and applying multipliers, hence providing a full estimate of the economic effect of these students.

With the exception of the following cases the allocation to industry categories is self evident. Having no information on the destiny of expenditure in the "other" category for student expenses, this expenditure was distributed across industries in the same pattern as the aggregate of existing study expense items (once computer

Table 6. Aggregate Estimates of International Student Expenditure

Type of Expenditure	
Direct educational expenses	$23,232,000
Living expenses	$16,947,500
Visitor expenditure	$2,359,100
TOTAL	**$42,538,600**

Table 7. Allocation of International Student Expenditure across Industry Categories, $'000s, 1994

Industry Category	Direct Educational Expenses ($'000)	Living Expenses ($'000)	Visitor Expenses ($'000)	Total Direct Expenditure ($'000)
Utilities	42.3	925.0	0.0	967.3
Wholesale and retail	2201.2	3961.3	585.9	6748.4
Mechanical & other repairs	0.0	355.0	0.0	355.0
Transport & communications	1566.1	2442.5	1198.9	5207.5
Finance, prop & Bus services	0.0	5925.5	0.0	5925.5
Community services	19422.4	0.0	0.0	19422.4
Ent't, recreation & pers serv.	0.0	3338.2	574.3	3912.5
TOTAL	**23232.0**	**16947.6**	**2359.1**	**42538.7**

and parking fees are excluded). In the data from the Western Australian Tourism Commission used to estimate visitor expenditure, expenditure on food and beverages is given as one item. A previous study on tourism expenditure by the Bureau of Industry Economics (1984, Table 2.1) showed average expenditure for overnight trips on restaurants and cafes as $3.76, and for food, groceries and other provisions as $2.50; a total of $6.26. Hence we distribute the estimated visitor expenditure on food and beverages by the proportions of 3.76/6.26 in recreation, personal and other services (which includes restaurants), and 2.50/6.26 in retail services. The conversion of the other expenditure items to industry categories is relatively straight forward. Discounting for earned income is achieved by proportionately reducing the amount of living expenses allocated to each industry category.

In Table 7 components of direct expenditure that pass into the economy as a result of international students at Curtin University are shown. Table 8 shows the direct expenditure and value of the multiplier for each industry category. The total effect is the product of the direct effect and the relevant industry multiplier. Thus, the results show that international students at Curtin University of Technology in 1994 generated direct spending into the Western Australian economy of $42.5 million dollars and that, in total, it is estimated that these students raised output in

Table 8. Total Economic Impact of Overseas Students, $'000s, 1994

Industry Category	Total Direct Effect ($'000)	Multiplier Type 1 ($'000)	Total Effect Direct and Indirect ($'000)
Utilities	967.3	1.5872	1,535.3
Wholesale and retail	6,748.4	1.2424	8,384.3
Mechanical & other repairs	355.0	1.253	444.8
Transport & communications	5,207.5	1.2438	6,477.1
Finance, property & business services	5,925.5	1.6167	9,579.8
Community services	19,422.4	1.1224	21,799.7
Entertainment, recreation & personal services.	3,912.5	1.5973	6,249.4
TOTAL	**42,538.7**		**54,470.4***

*Some rounding errors

the State by $54.5 million or 0.12 per cent of Western Australian Gross State Product. Based on an assumption of constant output across all workers in the economy, this similarly implies the creation of 0.12 per cent of total Western Australian employment, or around 970 jobs.

The data sources available for this study were confined to survey and administrative data from Curtin University only. Since it is known that Curtin University's share of the State's international student enrolment in 1994 was 56 per cent, it is naturally tempting to extrapolate these figures to arrive at estimates of the impact of all international students studying in the university sector in Western Australia. This gives an increase in State output of $97 million and 1,700 jobs, representing 0.21 per cent of state output and employment. Of course, such estimates must be taken as only representing a very general order of magnitude. Mostly, this is because the other Western Australian universities may have markedly different enrolment patterns, fees and cost structures.

The results are broadly consistent with estimates derived in similar studies. Due to differences in definition and methodology such comparisons must be treated with caution. However, the stability of estimates across states, institutions and time reinforces the importance of overseas students to a regional economy. Table 9 shows a comparison of the estimates of students' direct expenditure from this study with those from several others. A survey of the expenditure of international university students in Australia estimates that in 1992 each student spent an average of $504 per week (DEET 1993). Other estimates of total weekly expenditure range from $533 per week to $570. The present study estimated total expenditure at $497.

A report by Victorian Universities International (1996) estimates that the value of full-fee paying students in 1995 made a direct economic contribution of $507

Table 9. Comparisons of Estimates of Student Expenditure, by Categories, Between Studies.

Expenditure Category Per student per Week	Centre for International Economics Survey 1990	DEET International Students Survey 1992	McKay et al 1992	International Students at Curtin University 1994	Victorian Universities International 1995*
Accommodation	$64	$78	$69	**$63**	na
Food	$53	$55	$72	**$58**	na
Total Living Expenses	na	$280	$328	**$217**	$310
Education Expenses	na	$224	$205	**$280**	$260
TOTAL	-	**$504**	**$533**	**$497**	**$570**

Source: DEET 1993, Victorian Universities International 1996. For comparability, the figures for the present study are not discounted for earned income.

- The study did not indicate the number of weeks overseas students resided in Australia so to enable a comparison we used our figure of 42.3 weeks

million to the Victorian economy. McKay and Lewis (1995) estimate that, on average, each international student at the University of Wollongong created 0.57 full time equivalent jobs in the surrounding community. The figures generated above for Curtin University imply the creation of 0.49 jobs in Western Australia per international student. In a similar study in the United Kingdom, Love and McNicoll (1988) found that expenditure from international students increased regional output by 2.96 times the revenue paid to the host University. We find that the expenditure from international students increased output in Western Australia by 2.84 times the revenue paid directly to Curtin University of Technology in the form of university fees.

6. CONCLUSIONS

Clearly the provision of education services as an export item is not an insignificant endeavour for a small open economy such as Australia. Furthermore, Australia has a number of natural and comparative advantages over other providers that are available for exploitation. For example, the close proximity to Asia, a flexible and pedagogical system of education, a relatively stable domestic environment, an English speaking population and internationally competitive fees, living costs and travel expenses to name a few. In support of these natural advantages Australia has been focussed in its marketing strategies within the Asian countries.

In this study 1994 survey data was used to estimate the contribution of overseas students to the Western Australian economy. The direct benefits, in terms of the

expenditure of students and their visiting friends/family at Curtin University of Technology are considerable, a total of $42.5 m. When we include flow-on effects the contribution is $54.5m or 0.12 per cent of Western Australian gross product. This is equivalent to the creation of approximately 1000 jobs. The importance and relevance of these students becomes even more apparent when we consider intangible benefits particularly in the case of Australia where the long-term future lies directly in the Asian region. Consequently the export of education services, whilst generating export dollars and income in the domestic community must be viewed also as a strategic initiative that is mutually beneficial in encouraging and supporting ongoing business and cultural links.

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