

students are overseas students. If this pattern is mirrored by other foreign-born students, it could help to explain the exaggerations about numbers of overseas students in higher education.

Of the remaining non-overseas students born in Hong Kong, 6,380 declared a home residence in Australia, including 1,094 who had arrived since 1990. This leaves 453 Hong Kong born students holding citizenship or

permanent entry status, who have a home residence outside Australia.

## References

- <sup>1</sup> Ian Dobson 'Trends in Enrolments of Overseas Students in Higher Education', *People and Place*, vol. 1, no. 2, 1993, p. 39-45.
- <sup>2</sup> Department of Employment Education & Training Higher Education Student Data Collection: Main Documentation, 1988, p. 132.

## IS THERE A BRAIN DRAIN? THE CASE OF ENGINEERS

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Earlier studies including that by Pure<sup>1</sup> in 1988 revealed a net inflow into Australia of scientists and engineers as a result of immigration. A study conducted in 1992 by Birrell *et al.*<sup>4</sup> highlighted the continuing influx of professionals, in particular engineers, in spite of the very restricted job market.

However recent publicity given by the media to the departure from Australia of highly-skilled professionals has given rise to concerns that the net inflow of professionals has reversed to produce a possible 'brain drain'.

Other recent studies<sup>2,3</sup> of the future workforce demand in Australia for scientists and engineers have argued the need for a continued inflow of overseas professionals to meet a projected shortage by the year 2000. Such long-term projections do not address the question of the short-term impact of the current recession on the entry and exit of scientists and engineers.

It is the intent of this paper to use Bureau of Immigration and Population Research (BIPR) unpublished research statistics to review the evidence for the migration of engineers.

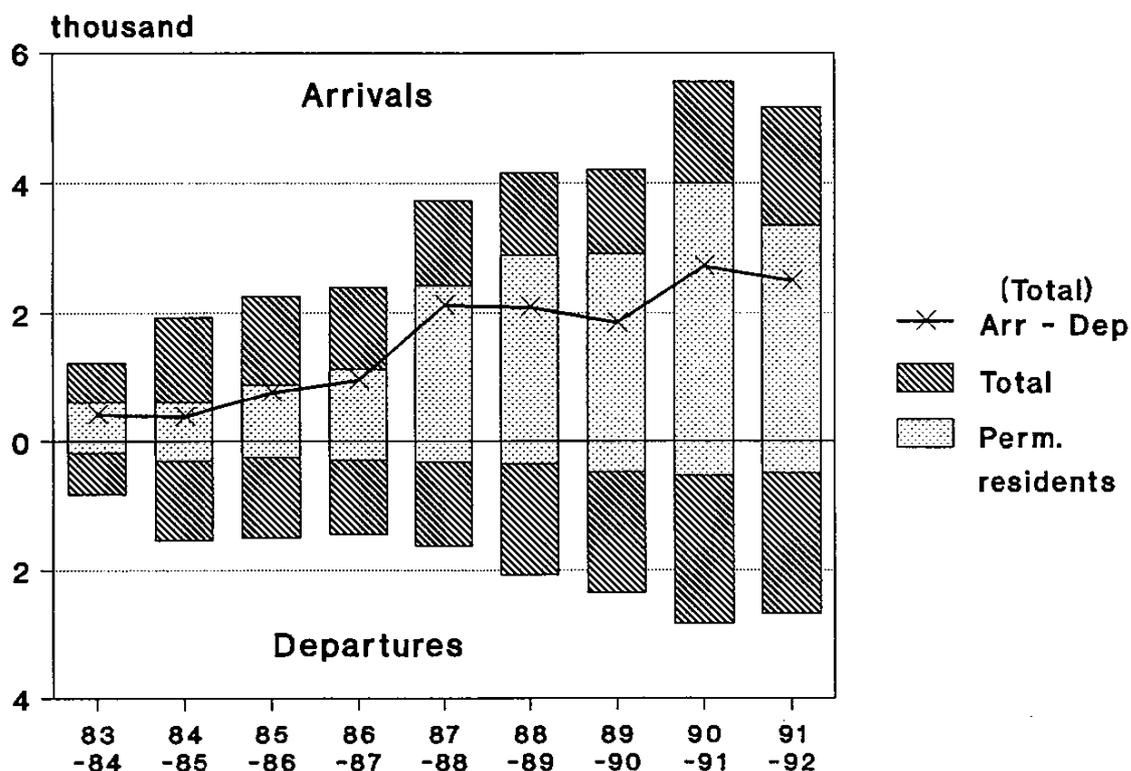
### THE MIGRATION PATTERN OF ENGINEERS

In addressing the question of whether there is a brain drain of engineers it has been decided to focus on the movement of permanent and long-term residents. The movement of engineers who define their departure as 'short term' may be important. However, because the data in these movements by occupation are based on a sample, the BIPR believes they are insufficiently reliable for analysis.

Figure 1 presents the data on the arrival and departure of engineers between 1983-84 and 1991-92. There are several points to be noted:

- i) There has been growth in the incoming and outgoing traffic.
- ii) There has been a net influx throughout the period that has

**Figure 1: Engineers: Permanent and Long Term movements, 1983-84 to 1991-92**



increased five-fold to 2,500 in 1991-92.

- iii) Arrivals with permanent resident status have grown from approximately one-third of total arrivals to two-thirds, whereas residents departing permanently have remained at approximately one-fifth the total departures.

The net gain influx of 5,225 engineers in the two-year period between

June 1990 and June 1992 exceeds the annual production of resident engineering graduates for 1990 and 1991 in Australia (see Table 1).

It can be concluded that in the case of engineers Australia has experienced a significant and growing 'brain gain'.

**ARRIVALS AND DEPARTURES BY COUNTRY OF BIRTH AND AREA OF ENGINEERING**

An examination of the statistics by country of birth reveals that engineers born in Australia are the dominant group in the arrivals and departures of long-term residents. They comprised 55 per cent of arrivals and approximately one-half of departures between mid-1990 and mid-1992. However, the overall balance is one of a net loss of 716 Australian-born engineers during this period. Contrary to expectations,

**Table 1: Resident Engineering Graduates**

	1990	1991
Other than Higher Degree*	3599	3779
Higher degree	626	8940
Total	4225	4673

\* Bachelors Pass and Honours, Diploma and Associated Diploma  
 Source: Dept of Employment, Education & Training, Selected Higher Education Statistics, 1991 & 1992.

the net loss in 1991/92 was lower than for 1990/91 (see Table 2).

Almost two-thirds of permanent and returning long-term resident engineers were in the engineering categories of civil, electrical and electronic and mechanical in the 1990 to 1992 period. During this time, engineers born in Hong Kong, Malaysia and India represented over half of the intake for these areas of engineering. Detailed statistics are given in Table 2. Table 2 also includes figures for the USSR which show a ten-fold increase in net arrivals between 1990-91 and 1991-92.

The influx of migrant engineers in 1992/93 is expected to drop significantly due to tightening of the accreditation requirements by the Institution of Engineers Australia and the introduction of vocational language testing for engineers by the Department of Immigration and Ethnic Affairs.

## EMPLOYMENT OPPORTUNITIES FOR ENGINEERS

Birrell *et al.*<sup>4</sup> noted that many recently-arrived engineers have difficulty finding employment within their profession. They reported Commonwealth Employment Service data on professional engineers in Victoria who were registered as unemployed as of November 1991. These included 719 civil, 753 electrical and 942 mechanical engineers — most of whom were recently arrived migrants. Another index of the extent of unemployment amongst migrant engineers can be drawn from a recent report by the Sydney division of the Institution of Engineers Australia.<sup>5</sup> The Division located 804 unemployed migrant engineers, 547 of whom had been unable to find any engineering employment since their arrival in Australia.

The July 1993 Skilled Vacancy Survey, published by the Department

**Table 2: Arrivals and Departures for Permanent and Long-Term Resident Engineers by country of birth**

Country	Civil			Electrical			Mechanical			All Engineers		
	Arr	Dep	Dif	Arr	Dep	Dif	Arr	Dep	Dif	Arr	Dep	Dif
<b>1990/91</b>												
Australia	96	151	-55	74	120	-46	23	36	-13	868	1269	-401
UK	68	31	37	122	43	79	50	14	36	452	299	153
Hong Kong	377	98	279	449	88	361	117	26	91	1115	290	825
Malaysia	174	46	128	86	21	65	66	16	50	407	155	252
India	91	5	86	227	16	211	148	4	144	646	45	601
USSR	7	0	7	5	1	4	4	0	4	28	2	26
All Countries	1220	443	777	1519	385	1134	682	148	534	5561	2836	2725
<b>1991/92</b>												
Australia	100	178	-78	86	102	-16	19	18	1	1006	1321	-315
UK	38	29	9	66	26	40	27	9	18	287	237	50
Hong Kong	234	81	153	305	83	222	13	24	59	758	228	530
Malaysia	58	21	37	50	18	32	26	7	19	188	103	85
India	89	8	81	294	18	276	139	13	126	633	73	560
USSR	58	1	57	105	0	105	93	0	93	303	1	302
All Countries	949	414	535	1551	366	1185	668	106	562	5175	2675	2500

Source: BIPR, unpublished

of Employment, Education and Training, indicates only a modest improvement in the skilled vacancy index for Building Professionals and Engineers between July 1991 (58) and July 1993 (72) (Base: February 1982 = 100). Thus, it seems likely that the employment situation for civil, electrical and mechanical engineers will not have improved since late 1991.

Further evidence for the depressed state of the employment market for civil, electrical and mechanical engineers is found in the Graduate Careers Council of Australia annual survey of the employment status of 1991 graduates as of April 30, 1992. Here it is reported that 24.2 per cent of civil engineering graduates, 16.7 per cent of electrical engineering graduates, 20.2 per cent of electronic/computer engineering graduates and 25.1 per cent of mechanical engineering graduates were seeking full-time employment.

While there is no direct information on the employment status of recent engineer immigrants, their visa category does provide a guide to their prospects for employment soon after arrival. Three-quarters or more of the engineers born in Malaysia, Hong Kong and India gained selection on the basis of their qualifications through the skill category, but only around 2 per cent of these came under the Employer Nomination Scheme. This suggests that very few of these engineers would

have employment on arrival. Although there will be a significant drop in the arrival of permanent migrant engineers in 1992/93, there is still no labour-market related component in the skilled selection system. This means there remains no effective control over entry of migrant engineers with qualifications in areas that are oversupplied e.g. civil.

## CONCLUSION

Immigration statistics reveal a net outflow of Australian-born engineers between 1990 and 1992 which is more than compensated by the net arrival of migrant engineers with permanent or long term resident status.

There was an upward trend in the net movement of engineers between 1983/84 and 1991/92 in spite of the recently depressed employment market.

## References

- <sup>1</sup> G. Pure, *Search* 19, 1988, pp. 85-89.
- <sup>2</sup> M.R. Rice, and B.E. Lloyd, *Professional Engineers in Australia*, Engineering Labour Force Series, EPM Consulting Group, 1991.
- <sup>3</sup> *The Demand and Supply of Scientists in Australia*, ASTEC Occasional Paper No. 16, 1991.
- <sup>4</sup> R.J. Birrell, E. Healy, and T.F. Smith, *Migration Selection During the Recession*, Department of the Parliamentary Library, Canberra, 1992.
- <sup>5</sup> Institution of Engineers Australia, Sydney Division, Unemployment of Engineers in NSW, Nov. 1992.

