THE MOVEMENT OF ENGINEERS IN AND OUT OF AUSTRALIA

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There has been considerable media attention recently as to the possibility of a new 'brain drain' of Australian professionals. The data on engineers show there is no case yet for such worries, but many migrants engineers have difficulty finding suitable employment.

Concerns over a 'brain drain' of professionally qualified persons from Australia continue to be voiced.[1] A report by Hugo[2] entitled 'Economic Implications of Emigration from Australia' specifically identifies a significant net loss of Australian-born professionals by permanent and long-term departure. Furthermore, the data for 1981 to 1991 presented in the report point to an increasing 'brain drain' of Australian-born professionals.

Hugo notes that the loss of Australian-born professionals is more than compensated for by the gain in overseas-born professionals through immigration into Australia. He does, however, point to settler loss as a significant contributor to a 'brain drain'.

While recognising that there are a range of factors that could influence the decision to emigrate, Hugo does identify the decline of the Australian economy as a possible reason for the growth in emigration of both Australian-born and settler professionals. He also notes the recent buoyancy of certain Asian economies and the growing demand for professionals within these economies.[2]

It is the purpose of this paper to extend a previous study[3] of the arrival and departure of permanent and long--term resident engineers to include Bureau of Immigration and Population Research (BIPR) unpublished research statistics for 1992-93 and to compare the evidence for the migration of engineers with the conclusions drawn by Hugo.

MIGRATION OF ENGINEERS

As in the previous study, the statistics are restricted to permanent and long-term residents. Figure 1 illustrates the movement of engineers to and from Australia between 1983-84 and 1992-93. Detailed statistics for 1992-93 for all engineers, and the individual engineering categories of Civil, Electrical and Mechanical for Australian-born engineers and other selected countries of birth, are presented in Table 1. The statistics for the net influx of permanent and long-term resident, foreign-born engineers between 1990-91 and 1992-93 are given in Table 2. The following observations are made:

i) There has been a significant decline in the arrivals between 1990-91 and 1992-93 with permanent resident arrivals as a percentage of total arrivals falling from 71.9 per cent in 1990-92 to 53.5 per cent in 1992-93 (Figure 1).

ii) There has been a slight decline in total departures over the past three years, but the departure of permanent residents has remained roughly constant at close to 500 per year since 1989-90 (Figure 1).

iii) The net outflow of 280 Australian-born engineers in 1992-93 continues the decline from 401 in 1990-91 and 315 in 1991-92[4] (Table 1).

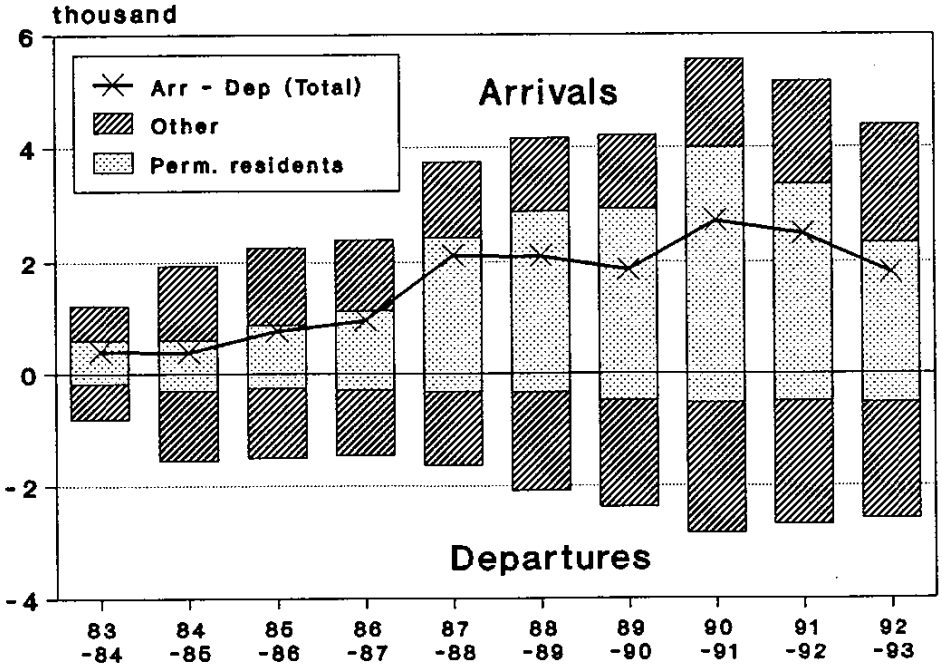
iv) The influx of foreign-born engineers, particularly those arriving as permanent settlers has declined from 1990-91 to 1992-93 (Table 2).

v) There has been a significant fall from 1990-91 to 1992-93 in the numbers of immigrant engineers born in Hong Kong and India, but less dramatic changes in their percentage contributions to the influx (Table 2).

vi) The immigration of Malaysian-born engineers in 1992-93 has fallen to less than one-tenth the 1990-91 influx and now only represents one per cent of the total influx (Table 2).

vii) There has been a dramatic increase between 1990-91 and 1992-93 in the entry of engineers from the former USSR and the Baltic States, almost totally in the permanent resident category.

Figure 1: Engineers, permanent and long-term movements, 1983-84 to 1992-93



Source: BIPR unpublished tables

Table 1: Arrivals and departures, permanent and long-term resident engineers, 1992-93

Country of birth	Civil			Electrical			Mechanical			All Engineers		
	Arr	Dep	Net	Arr	Dep	Net	Arr	Dep	Net	Arr	Dep	Net
Australia	114	168	-54	96	71	25	29	31	-2	990	1270	-280
UK[a]	53	34	19	75	34	41	47	19	28	407	277	130
Hong Kong	140	46	94	255	57	198	79	11	68	549	165	384
Malaysia	59	38	21	35	23	13	17	8	9	166	145	21
India	42	5	37	130	14	116	79	8	71	310	50	260
USSR[b]	52	1	51	247	1	246	98	0	98	436	5	425
Eastern Europe	40	10	30	76	6	70	66	2	64	230	31	199
All countries	778	379	399	1277	299	983	568	113	455	4382	2573	1809

[a] England, UK, Scotland, Wales, Northern Ireland [b] USSR and Baltic States

Source: BIPR unpublished tables

Table 2. Net influx[a] of foreign-born engineers

Country of birth	1990-91			1991-92			1992-93		
	Perm. Res.	Total[b] No.	Total[b] %	Perm. Res.	Total[b] No.	Total[b] %	Perm. Res.	Total[b] No.	Total[b] %
UK[c]	231	174	5.6	133	136	4.8	63	130	6.2
Hong Kong	1071	825	26.4	635	530	18.8	327	384	18.4
Malaysia	356	252	8.1	108	85	3.0	28	21	1.0
India	612	601	19.2	598	560	19.9	274	260	12.5
USSR[d]	25	26	0.8	303	304	10.8	420	425	20.3
Eastern Europe	77	77	2.5	299	291	10.3	209	199	9.5
Other	1097	1171	37.5	793	909	32.3	504	670	32.1
TOTAL (excluding Aust)	3469	3126	100.0	2869	2815	100.0	1825	2089	100.0

[a] Difference between arrivals and departures [b] Total permanent and long-term residents
[c] England, UK, Scotland, Wales and Northern Ireland [d] USSR and Baltic States
Source: BIPR, unpublished tables

Media attention has focussed on the outflow of Australian-born engineers, ignoring the continuing high level of these engineers returning to Australia. Over the three year period 1990-91 to 1992-93, despite the depressed employment market for engineers, close to 1,000 have returned each year.

The drop in the inflow of immigrant engineers in 1992-93 was to be expected, given the tightening of 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 in 1992. Nevertheless, it appears that Australia remains an attractive destination for migrant engineers and that arrivals considerably outnumber departures. Furthermore, contrary to the overall situation for professionals reported by Hugo, there is no indication of an increase in the emigration of Australian-born or foreign-born engineers.

It is to be expected that country of birth will have a significant influence on the educational and cultural background, and the English language proficiency, of the foreign-born immigrant engineer settlers. These are factors that are also going to impact upon the likelihood of securing employment. It is interesting in this context to note the emergence of the former USSR and Baltic States as the major source of foreign-born engineer immigrants.

It is generally assumed that the Australian economy benefits from the entry of skilled migrants. In contrast, it has been previously pointed out[5] that there is strong evidence of high unemployment amongst immigrant engineers based upon data from the Commonwealth Employment Service and the Institution of Engineers, Australia. The 1991 census data provide a further mechanism for exploring the employment status of foreign-born engineers. This is illustrated here for the particular case of persons holding civil engineering qualifications (Table 3).

Table 3 reveals a marked contrast between the level of employment for Australian, UK and Ireland-born persons with civil engineering qualifications and those whose native language is not English. Approximately one-third of the

foreign-born civil engineers from non-English-speaking-background countries presented in Table 3 reported that they were unemployed or not in the workforce in 1991.

Length of residence can also be expected to be a factor influencing employment status. In the case of UK and Ireland-born, and USSR and Baltic States-born civil engineers, approximately three-quarters arrived prior to 1981, whereas approximately two-thirds of the Asian-born arrived between 1986-91. Thus, the unemployment figures for Asian-born engineers are dominated by the employment status of relatively recently arrived residents. When the employment status for USSR and Baltic States-born civil engineers who arrived between 1986 and 1991 are considered, we find that 57.5 per cent were either unemployed or not in the workforce, as compared with 21.2 per cent of those claiming qualification in civil engineering from the UK and Northern Ireland.

Table 3: Employment of persons with civil engineering qualifications, 1991

Country of birth	Employed		Unemployed		Not in work-force		Not stated		Total
	No.	%	No.	%	No.	%	No.	%	
All civil engineers	26,820	80.6	2,228	6.7	4,178	12.6	48	0.1	33,274
Australia	17,875	85.8	672	3.2	2,269	10.9	12	0.1	20,828
Southern Asia	709	66.1	245	22.9	115	10.7	3	0.3	1,072
Northern Asia	631	66.4	119	12.5	192	20.2	8	0.8	950
South East Asia	1,262	68.8	290	15.8	275	15.0	7	0.4	1,834
UK and Ireland	2,387	78.8	168	5.5	475	15.7	0	0	3,030
Eastern Europe	480	64.4	113	15.2	146	19.6	6	0.8	745
USSR[a]	136	41.8	53	16.3	133	40.9	3	0.9	325

[a] USSR and Baltic States Source: ABS customised matrix, Centre for Population and Urban Research

Table 4: Nature of employment (selected categories) for persons holding civil engineering qualifications

Country of birth	Management admin.		Building prof. & engineer		Para-prof.		Sales		Plant machine operator		Labourer		Other occupation		Unemp. or not in wkforce		Total
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.
Aust.	3,076	14.7	8,353	40.1	3,398	16.3	388	1.7	252	1.2	299	1.4	2,109	10.1	2,953	14.2	20,828
S Asia	51	4.8	391	36.5	68	6.3	20	1.9	11	1.0	18	1.7	150	14.0	363	33.9	1,072
N E Asia	60	6.3	209	22.0	47	4.9	40	4.2	46	4.8	93	9.8	136	14.3	319	33.6	950
S E Asia	92	5.0	408	22.2	144	7.9	59	3.2	82	4.5	118	6.4	359	19.6	572	31.2	1,834
UK[a]	496	16.4	951	31.4	401	13.2	79	2.6	35	1.2	53	1.7	372	12.3	643	21.1	3,030
E. Eur.	52	7.0	183	24.6	87	11.7	15	2.0	15	2.0	30	4.0	98	13.1	265	35.6	745
USSR[b]	26	8.0	44	13.5	29	8.9	6	1.8	-	-	3	0.9	28	8.6	189	58.2	325

[a] UK and Ireland [b] USSR and Baltic States.
Source: ABS customised matrix, Centre for Population and Urban Research

The nature of the employment is relevant to the assessment of the economic value of a person holding professional qualifications. Table 4 provides a breakdown of the employment of persons holding civil engineering qualifications into a selection of the employment categories available in the Census data.

In the case of Australian-born civil engineers, 40 per cent are employed as engineers, with 71 per cent employed in a professional capacity (management, administration, building profession, engineer or para-professional). A similar distribution of employment within the professional classifications is also seen for UK and Ireland-born persons, but with a lower level of employment as engineers.

Significantly lower proportions of civil engineers from non-English speaking background countries are employed in management, administration and para-professional positions in comparison with Australian and UK and Ireland-born civil engineers. Civil engineers born in north-east and south-east Asia also have a very low level of employment as engineers and higher levels of employment in the categories of plant and machine operator and labourer. In contrast southern-Asian-born civil engineers have a level of employment as engineers exceeding that of UK and Ireland-born, but less than Australian-born.

An unexpected finding from the Census data is the low level of professional employment for those born in north-east Asia (mainly Hong Kong) who arrived in Australia between 1986 and 1991. Out of 599 who claimed civil engineering qualifications, only 77 were employed as engineers (12.9 per cent) in 1991. By contrast, 86 were employed as labourers (14.4 per cent). It is generally assumed that those coming from this location would have been exposed to a western education delivered in English and therefore would have qualifications comparable with those from an English-speaking background.

CONCLUSION

The 1991 census data for civil engineers reveal that one in three, or more, of civil engineers with a non-English speaking background were not in the workforce, compared with one in seven for Australian-born and one in five for immigrants born in the UK and Ireland. Approximately one in three immigrants from non-English speaking backgrounds are in professional employment (management, administration, building professional, engineer or para-professional).

Thus, while Australia continues to benefit from a 'brain gain' of engineers, the economic benefit is heavily discounted by the nature of the employment they are able to secure. The effectiveness of immigration as a means of meeting a short-fall in the training of engineers must be questioned. Furthermore, the extent to which the poor employment prospects for immigrant engineers influences the entry of Australian residents into engineering training needs to be considered. There is little benefit from an immigration policy that undermines the costly investment in educational facilities for the training of engineers in Australia.

References

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5. R.J. Birrell, E. Henley, and T.F. Smith, *Migration Selection During the Recession*, Department of the Parliamentary Library, Parliament House, Canberra, 1992.