The Economics of Education and Training 1995

Edited by

Fran Ferrier and C. Selby Smith
© Commonwealth of Australia 1995
ISSN 1324-7034
ISBN 0644 356626

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This project has been assisted by the Commonwealth Government through the National Research Advisory Council of the Australian National Training Authority.

Copies are available from

Monash University-ACER Centre for the Economics of Education and Training
Clayton Faculty of Education
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CLAYTON, Victoria 3168

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The Economics of Education and Training 1995

Introduction

This is the second collection of writings on the economics of education and training compiled by the Monash University-ACER Centre for the Economics of Education and Training (CEET). It includes work by Centre members and by other researchers in the field. CEET plans to produce further editions of this publication in the future.

Particular attention is paid in this edition to the economics of Vocational Education and Training (VET). There are two main reasons for this. First, CEET is receiving Centre funding in 1995 from the Research Advisory Council of the Australian National Training Authority to conduct a program of research on the economic impact of VET. Consequently, much of the Centre's work is focused on this area. Secondly, VET is currently undergoing a substantial reform process that makes it of particular interest to researchers in the economics of education.

Ten of the eighteen papers in this book are specifically concerned with VET and with issues relevant to the VET reform process. They include reports of recent research, as well as reviews and reflective papers. For instance, Damon Anderson presents initial results of his research into private providers in the training market. Peter Rushbrook and Mike Brown provide an interesting history of 'operative' workers, with some recent case studies of the impact on them of micro-economic reform and work-based training, and Andrew Smith reviews some models of enterprise training.

The remaining eight papers deal with other aspects of the economics of education. Three are concerned with overseas issues. Phil Lewis on the demand for education in Singapore, Phil Lewis and Danielle Shea on Malaysian demand for university education in Australia, and Ross Harrold on the internal costing of schools and the impact of funding arrangements in the U.S. Other papers are more specifically focused on Australia, for example Leo Maglen presents his latest study of rates of return to university degrees.

It is a pleasure to acknowledge the valuable assistance provided by Vivienne Roberts in preparing the papers for publication.

August 1995

F. Ferrier
C. Selby Smith
Monash University - ACER
Centre for the Economics of Education and Training

The Centre is a joint venture of Monash University and the Australian Council for Educational Research (ACER). It serves as a focus for the research, teaching and formulation of policy advice in the economics and finance of education and training. The Centre has four Co-Directors: Associate Professor Gerald Burke (Faculty of Education, Monash) Executive Director; Dr Phillip McKenzie (ACER); Dr Leo Maglen (Department of Economics, Monash); and Professor Chris Selby Smith (Department of Business Management, Monash). There are also three Research Fellows: Ms Fran Ferrier; Ms Aija Grauze; and Dr Chandra Shah. Mrs Val Newson manages the Centre’s office. Associate Professor Julian Teicher (National Key Centre for Industrial Relations) and Mr Damon Anderson are Associates of the Centre.

During 1993 and 1994 the Centre received a grant from the Australian National Training Authority (ANTA) to conduct a review of the literature on the economics of vocational education and training. In 1994, ANTA published two major documents arising from this work. *The Economics of Vocational Education and Training in Australia, A Review of Recent Literature*; and an annotated bibliography, *Past Imperfect: Future Imperative, a Guide to Recent Australian Literature on the Economics of Vocational Education and Training*.

Following completion of this work, the Centre successfully applied for funding as a VET Research Centre from the National Research Advisory Council of ANTA to support a program of research on the economic impact of VET. During 1995 and 1996, the Centre will be conducting research projects including:

- Globalisation of the Australian economy and its impact on occupational patterns;
- Pathways through education, training and work;
- Relationships among formal education, informal training, work organisation, management and outcomes in the health industry;
- Analysis of the 1993 ABS Survey of Training and Education Experience;
- Analysis of training arrangements in enterprise agreements;
- Review of data for VET research, and
- Provision of VET in the adult, community and further education sector.

In conjunction with the Centre of Policy Studies and the Centre for Population and Urban Research, the Centre is also conducting work on supply in the professions and skilled occupations, partly supported by an ARC grant.

The Centre conducts a monthly seminar series and publishes research working papers. A two day conference on economic aspects of VET will be held in Melbourne on Thursday 7 and Friday 8 December 1995. The Conference Proceedings will be published in 1996.

Further information about the Centre and any of its activities can be obtained from Fran Ferrier at CEET, Faculty of Education, Monash University, Clayton Victoria 3168 (Telephone: 61 3 9905 2808/2865; Facsimile: 61 3 9905 2779, Email: fran.ferrier@education.monash.edu.au)
1. Introduction: The Rise of Private Training Providers

Non-government providers of vocational education and training (VET) have been operating independently alongside technical and further education (TAFE) colleges for many years in a range of industry sectors including business services, retailing, personal services, and manufacturing. Until recently, however, private training providers have been largely hidden from public view and almost totally ignored or overlooked in government policy. Since its formal establishment following the Kangan Report (1974), the TAFE system has enjoyed a virtual monopoly over government-funded VET and almost exclusive control of publicly recognised vocational qualifications. In a highly segmented training market, private providers in industry and elsewhere were confined to marginal areas of training provision and denied formal recognition for their activities.

Since the late 1980s, recognition has been growing in Australia of the role performed by private providers in the delivery of vocational education and training and of their contribution to the process of national skills formation. Several major policy pronouncements and key reports have identified private providers as an alternative source of training and have recognised their potential for satisfying future growth in demand for skills and qualifications (e.g., Dawkins 1989, Deveson 1990a).

In late 1990, Commonwealth, State and Territory Ministers responsible for vocational education and training announced their decision to promote the development of an 'open training market' comprising a diverse range of high quality providers from the public and private sectors. This step signifies a fundamental shift in official attitudes towards the balance of public and private sector responsibility for financing and delivering VET and heralds a thoroughgoing transformation of the traditional roles and relationships of public and private VET providers. As the Finn Review stated, 'governments have consciously supported a significant role for private providers by endorsing the concept of an open training market...' (1991, pp.112-3)

Subsequently, the National Framework for the Recognition of Training (NFROT) was established to facilitate the formal recognition of private providers and to integrate them into the national VET system. The resulting expansion in the number and range of authorised private providers, together with the progressive introduction of market mechanisms for the allocation of public VET funds, promises to change the face of vocational education and training in Australia.

2. The Uncharted Terrain of Private Training Provision

In spite of their longstanding existence and growing prominence in contemporary public policy in Australia, little is known about private training providers or the sector as a whole. Other than in a few isolated cases, research on post-school VET provision in Australia has to date focussed almost exclusively on the public TAFE sector. As Noonan observed, despite recent widespread interest in the private training market, 'we know very little about the composition of that market, who the major providers are, the quality of provision and what
impediments exist to its more successful operation' (1992, p 3)

Although recent government reports dealing with training reform have vigorously promoted a greater role for and reliance on private providers (Deveson 1990a, HRSCEET 1991, Finn 1991, Carmichael 1992), none have actually examined the nature and extent of private training provision or evaluated the consequences of altering the existing balance between the public and private VET sectors. Humphrey (1992) for example, drew attention to the failure of the Finn Review (1991) to take account of workplace training and its potential contribution to achieving targets for increasing young people's participation in post-compulsory education and training. In effect, national training policy is being formulated without sufficient knowledge or understanding of a key sector of post-school VET provision.

One of the principal reasons for the lack of research on private VET provision has been the almost total absence of official statistics on the sector and its constituent parts. Neither the Australian Bureau of Statistics (ABS) nor any other government department has to date collected data on private training provision on a comprehensive or regular basis. In an examination of intersectoral education and training statistics in 1992, the Department of Employment, Education and Training (DEET) found that 'there is no reliable information at this stage about the number of private providers' (1992a, p 20). Numerous gaps were identified in the data base relating to registered private providers including student enrolments, educational attainment (course completion and graduation rates), participation (by age and sex), institutional statistics (number, size, location), employment (teaching and non-teaching staff), and finance (income and expenditure). DEET concluded that there is 'little or no information on accredited private and industry providers', information which it considers to be 'basic' to understanding the sector (1992a, p 30).

The lacuna of information about private VET provision is not unique to Australia. There is a dearth of primary-data and secondary research on this aspect of post-school provision in most OECD countries. Due to the growing significance of private providers in the overall provision of post-school education and training in its member countries, however, the OECD (1991) recently highlighted the need for researchers and policy-makers to investigate the phenomenon and to address its policy implications in a more systematic and coherent manner.

This chapter examines the current state of information and knowledge about this long neglected sector of post-school VET provision in Australia.

3. Defining Private Sector Training

'Private training provision' is a complex and problematic term to define. There is currently no single agreed definition in common usage. In general, the term is used to refer to the provision of post-school VET in the non-government sector by privately-financed individuals and institutions operating more or less independently of government control. Such a broad definition encompasses a bewildering array of training activities and providers. Technically, private training provision can embrace any and every privately produced and consumed training activity including on-the-job training provided by employers; short courses, single lectures and seminars delivered by training consultants and professional associations, post-purchase demonstrations provided by equipment suppliers and manufacturers, and VET...

1 For the purposes of this chapter, a rough distinction has been drawn between structured vocational training for gaining access to employment and/or further education and formal or informal training for personal development and recreation.
programs offered by private training institutions, such as business colleges. In terms of composition, the private training sector is more heterogenous than the public TAFE sector which is comprised primarily of institutional providers of off-the-job training.

4. A Taxonomy of Private Providers

As the breadth and diversity of the private VET sector is so great, it is difficult to identify features and patterns which are sufficiently common and consistent to constitute a satisfactory basis for both encapsulating the whole and distinguishing between the parts. In the absence of any other appropriate taxonomy of private providers, the categories identified under NFROT are the most readily available tool for classifying private providers commercial, industry, enterprise, and community providers. More recently, a fifth category has come into existence with the emergence of a significant number of independent and state secondary colleges seeking registration as private training providers.

The category of commercial providers includes individuals and organisations which provide training on a commercial, usually for-profit, basis. This category is comprised largely of privately-owned schools, colleges and other training institutions which are independent of government in terms of finance, governance and administration. In general, these institutions derive the bulk of their income from private sources by attracting individuals to undertake training on a fee-paying basis.

Industry providers are generally organisations which provide a range of tailored training activities on an industry-wide basis to personnel employed at various levels of the workforce from the shopfloor to management. Often this training is provided on a non-commercial basis to members or associates in the case of professional or trade associations, although an increasing number of industry providers are offering their services on a commercial basis.

Enterprise providers are essentially in-house providers of firm-specific training for employees. The training operation is typically an integral part of the host organisation and is geared to fulfil a human resource development function, often in conjunction with other operational responsibilities such as personnel management. In general, enterprise providers concentrate on the provision of in-house programs which are delivered in a variety of ways, including both integrated on-the-job training by supervisors and 'time-out' sessions conducted by the firm's internal training staff or external consultants. As with industry providers, enterprise trainers are increasingly offering their services to external fee-paying clients.

Welfare agencies, neighbourhood learning centres, adult and further education providers and Skillshare agencies are the main constituents of the community provider category. These bodies provide training for staff, welfare clients and individuals from the local community. By and large, community-based providers are non-profit in nature, non-institutional in character, locally managed and administered and largely subsidised by government.

The lack of consistency in provider definitions and categories employed in available data collections presents major problems for comparative analysis. For the purposes of this chapter, the term 'private provider' is used in a generic sense to refer to all five of the above NFROT categories unless otherwise stated. The term 'non-TAFE providers' is used on those occasions where data sets have been constructed without reference to NFROT categories and in such a way as to enable this distinction to be
Such a taxonomy is imperfect as there is considerable overlap between categories. For instance, increasing numbers of industry, enterprise and community providers are offering training services on a commercial basis. Nevertheless, in spite of the imprecise nature of the taxonomy and the lack of definitional clarity, these categories are conceptually distinct, can generally be identified in practice and, therefore, prove useful for the purposes of explanation and analysis.

5. Size and Extent of the Private Training Sector

The lack of a comprehensive database on the private VET sector has to date made it impossible to determine its actual size and composition with any accuracy or precision. Also, the lack of data has hampered the capacity of researchers to undertake any comparative analysis of the relative contribution of the private VET sector, vis a vis TAFE, to national skill formation. Nevertheless, existing data on participation rates and training revenue enables some qualified inferences to be made about the scale, internal organisation and relative significance of the private training sector.

Participation

According to a 'guesstimate' of the size of the private training sector in Queensland in 1989, registered private providers accounted for between 5 and 10 per cent of the VET market (DEVET, 1989). In Victoria, it was estimated that registered private providers would deliver up to five million student contact hours of training in 1992, equivalent to over 10 per cent of the total training delivered by the Victorian TAFE college system (DET 1992).

Participation in Education Australia (ABS 1991) indicated that 36,500, or 1.3 per cent, of people aged 15 to 24 years and enrolled in education were attending tertiary institutions 'other' than higher education institutions or TAFE colleges, as against 239,700 or 8.8 per cent of the same age cohort who were attending TAFE colleges. On the basis of this information, albeit limited, it would appear that in 1991 there was roughly one student under 25 years of age enrolled in non-government tertiary institutions for every eight TAFE students of comparable age.7

The Transition from Education to Work Survey (ABS, 1992) recorded that 162,500 persons aged 15 to 64 years were attending an educational institution 'other' than schools, higher education or TAFE colleges (as against 550,800 persons in the same age group attending TAFE) Assuming that the 'other' category was comprised predominately of non-government post-secondary educational institutions, these figures suggest that up to 23 per cent of all people who were aged between 15 and 64 years and participating in education were enrolled in the private sector.

7 Up until 1993, private training providers, such as business colleges and industry skill centres, were included by the ABS in the 'other' category of educational providers for which student enrolments were recorded. The 'other' category included all providers of secondary and post-secondary education and training other than government-funded schools, TAFE colleges and universities. As this category was not disaggregated prior to 1993, no indication can be gained of the type of institution or course in which people were enrolled, or of the types of awards to which their courses were leading, prior to that date.
According to the most recent ABS data contained in Training and Education Experience. Australia 1993 (ABS 6278.0, September 1994), 841,100 persons were enrolled in 1993 in post-secondary studies leading to qualifications up to and including diploma level courses. This number represents around 9 per cent of the 9.2 million persons who were in the labour force (or 'marginally attached to the labour force'). As reflected in Table 1, TAFE accounted for the largest share of enrolments in non-degree post-secondary qualifications with around 61 per cent of the total student population, while the non-TAFE sector (industry skill centres, business colleges and other) accounted for 26 per cent. Taken together, industry skill centres and business colleges accounted for just under 7 per cent of total enrolments and the 'other' category — which includes organisations such as professional associations, other commercial training organisations and non-profit training organisations — accounted for about 20 per cent.

Table 1: Persons Enrolled in Studies for Non-Degree Post-Secondary Qualifications, 1993 (number of enrolments '000)

<table>
<thead>
<tr>
<th>Qualification</th>
<th>University</th>
<th>TAFE College</th>
<th>Other</th>
<th>Industry Skills Centre</th>
<th>Business College</th>
<th>Secondary School</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diploma</td>
<td>538</td>
<td>1658</td>
<td>300</td>
<td>64</td>
<td>53</td>
<td>00</td>
<td>2613</td>
</tr>
<tr>
<td>Vocational Quals</td>
<td>170</td>
<td>2681</td>
<td>526</td>
<td>78</td>
<td>103</td>
<td>06</td>
<td>3564</td>
</tr>
<tr>
<td>Other</td>
<td>173</td>
<td>820</td>
<td>822</td>
<td>178</td>
<td>101</td>
<td>140</td>
<td>2234</td>
</tr>
<tr>
<td>Total</td>
<td>881</td>
<td>5159</td>
<td>1648</td>
<td>320</td>
<td>257</td>
<td>146</td>
<td>8411</td>
</tr>
</tbody>
</table>

Source: Allen Consulting Group 1994

If the focus is narrowed to participation in courses leading to diploma and vocational qualifications outside the university and school sectors, student enrolments in TAFE accounted for 79 per cent of the total population, while the non-TAFE sector accounted for about 21 per cent. Of the latter group, industry skill centres and business colleges accounted for over 5 per cent, while 'other' non-TAFE providers accounted for 15 per cent of the market for non-degree post-secondary qualifications offered outside secondary schools and universities. In terms of participation in courses leading to non-degree post-secondary qualifications, therefore, these figures suggest that the non-TAFE sector is around one quarter the size of the TAFE sector.

With respect to persons enrolled in post-secondary qualifications by area of study, Table 2 indicates that the major areas of course provision by TAFE colleges are business and administration, engineering, architecture and building, and society and culture in descending order. Courses in business and administration, health and miscellaneous fields figure prominently in the non-TAFE sector. Thirty-seven per cent of post-secondary courses offered by industry skills centres and business colleges are in the field of business and administration. The ABS estimates also show that, in 1993, TAFE was the major supplier of skilled and basic vocational qualifications, associate diplomas and short certificate courses, whereas the non-TAFE sector accounted for a considerable proportion of the output of short certificate courses. Between them, industry skill centres and business colleges accounted for around 17 per cent of certificates which were less than one semester in duration.
Table 2: Persons Enrolled in Studies for Post-Secondary Qualifications by Area of Study, 1993 (number of enrolments '000)

<table>
<thead>
<tr>
<th>Area of Study</th>
<th>TAFE College</th>
<th>Industry Skills Centre</th>
<th>Business College</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business and administration</td>
<td>120.7</td>
<td>51.0</td>
<td>8.1</td>
<td>20.3</td>
<td>154.2</td>
</tr>
<tr>
<td>Health</td>
<td>19.3</td>
<td>20.0</td>
<td>0.6</td>
<td>35.5</td>
<td>57.4</td>
</tr>
<tr>
<td>Education</td>
<td>6.5</td>
<td>-</td>
<td>-</td>
<td>4.1</td>
<td>10.2</td>
</tr>
<tr>
<td>Society and culture</td>
<td>37.3</td>
<td>0.1</td>
<td>0.6</td>
<td>17.8</td>
<td>55.8</td>
</tr>
<tr>
<td>Natural and physical sciences</td>
<td>28.3</td>
<td>18.2</td>
<td>2.0</td>
<td>3.4</td>
<td>35.5</td>
</tr>
<tr>
<td>Engineering</td>
<td>113.4</td>
<td>29.1</td>
<td>1.1</td>
<td>8.2</td>
<td>125.6</td>
</tr>
<tr>
<td>Architecture and building</td>
<td>48.6</td>
<td>12.2</td>
<td>1.1</td>
<td>2.6</td>
<td>53.5</td>
</tr>
<tr>
<td>Agriculture and related fields</td>
<td>17.3</td>
<td>-</td>
<td>-</td>
<td>0.6</td>
<td>17.9</td>
</tr>
<tr>
<td>Miscellaneous fields</td>
<td>61.6</td>
<td>16.9</td>
<td>2.1</td>
<td>37.9</td>
<td>108.5</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>453.0</strong></td>
<td><strong>20.0</strong></td>
<td><strong>15.6</strong></td>
<td><strong>130.4</strong></td>
<td><strong>618.6</strong></td>
</tr>
<tr>
<td>Certificate of less than one semester</td>
<td>58.3</td>
<td>13.7</td>
<td>10.1</td>
<td>47.6</td>
<td>27.4</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>511.3</strong></td>
<td><strong>33.7</strong></td>
<td><strong>25.7</strong></td>
<td><strong>178.0</strong></td>
<td><strong>646.0</strong></td>
</tr>
</tbody>
</table>

Source: Allen Consulting Group 1994

Training Revenue

Consultants to the Deveson Inquiry into the Training Costs of Award Restructuring (1990), estimated that expenditure on formal training by industry amounted to $1.3 billion in 1989. This figure is roughly equivalent to the approximate amount of $1.5 billion in recurrent government funding allocated to the TAFE system in 1989. An estimated 32 per cent of expenditure by industry was on 'external providers in the form of consultants and training organisations' (Deveson 1990b, p 7).

Although such estimates suggest that industry-funded training accounts for a substantial proportion of the total training effort in Australia, they fail to shed any light on the relative market shares of public and private providers. It is unclear, for example, what proportion of industry-funded training is provided by TAFE colleges as opposed to private providers as both are classified as 'external providers'. Nor do such bald estimates provide any measure of the quantity of training purchased by individuals (either employed or unemployed) on a private basis, as distinct from training purchased by employers.

More recently, the Allen Consulting Group (ACG, 1994) prepared estimates of the absolute size of the training market and its various sectors based on data from the Australian Committee for Vocational Education and Training Statistics (ACVETS) and the ABS. As reflected in Table 3, ACG estimated that the total size of the training market is between $6.5 billion and $8.6 billion per annum. In terms of training revenue, the non-TAFE training sector accounted for between $3.61 billion and $5.70 billion in 1992, whereas TAFE received $2.93 billion. Taking ACG's preferred minimum size estimate as the point of comparison, these figures suggest that, although TAFE is the largest single sector, the non-TAFE training sector as a whole is approximately 19 per cent larger than the TAFE sector in terms of training investment.
Table 3: Estimates of Size of Major Training Provider Groups

<table>
<thead>
<tr>
<th>Provider Group</th>
<th>Estimated Size (1992, $m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAFE (also includes State funded adult education organisations)</td>
<td>2934</td>
</tr>
<tr>
<td>Adult and community education centres</td>
<td>250-300</td>
</tr>
<tr>
<td>(ABS definition non-profit, non-government organisation probably under local control)</td>
<td></td>
</tr>
<tr>
<td>Industry skill centres</td>
<td>200-250</td>
</tr>
<tr>
<td>(ABS definition vocation oriented training centres providing accredited courses such as automotive skills centres)</td>
<td></td>
</tr>
<tr>
<td>Business colleges</td>
<td>60-150</td>
</tr>
<tr>
<td>(ABS definition private commercial and secretarial colleges)</td>
<td></td>
</tr>
<tr>
<td>Commercial training businesses</td>
<td>500-1000</td>
</tr>
<tr>
<td>(Definition by default as other commercial training organisations)</td>
<td></td>
</tr>
<tr>
<td>Non-profit training organisations</td>
<td>500-1000</td>
</tr>
<tr>
<td>(Definition by default as other non-profit training organisations)</td>
<td></td>
</tr>
<tr>
<td>Supplier, equipment manufacturer</td>
<td>1000-1700</td>
</tr>
<tr>
<td>(No explicit definition, taken as self-explanatory)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>1100</td>
</tr>
<tr>
<td>(Taken as enterprise internal training. Size figure is for enterprise internal training spending only and excludes employee salary cost while undertaking training)</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>6544-6634</td>
</tr>
</tbody>
</table>

Source: Allen Consulting Group, 1994

5. Composition of the Private Training Sector

The first attempt to map the contours of the private training sector in Australia and to construct a national profile of private providers was undertaken for a comparative study of public and private training institutions in 1992/93 commissioned by the National Centre for Vocational Education Research (NCVER) Ltd (Anderson, 1994). The study found that the total number of registered private providers in Australia had increased more than twofold from 309 in September 1992 to 782 in October 1993.

Commercial providers comprised the largest category of registered private providers in Australia. Nationally, they accounted for 42 per cent of all registered private providers. Community providers, who increased from around 16 per cent of all registered private providers in September 1992 to 33 per cent in October 1993, were the fastest growing sub-group. Industry providers accounted for 12 per cent and enterprise providers for 13 per cent of all registered private providers in October 1993. The study also revealed that the numbers and relative proportions of the various sub-groups of private providers differed significantly between States, reflecting regional variations in training demand and supply.
Employing the NFROT taxonomy, the Allen Consulting Group constructed a national profile of registered private providers in the latter half of 1994 (see Table 4). A comparison of the Anderson and ACG data shows that, although the total number of registered private providers had increased by 55 per cent between October 1993 and September 1994, the relative proportions of private provider sub-groups remained roughly the same. Commercial providers continued to be the predominant sub-group, followed by community providers, enterprise providers, industry providers and other providers in descending order.

Table 4: Registered Private Providers, June-September 1994
(Number of providers with percentage share of total)

<table>
<thead>
<tr>
<th>STATE</th>
<th>Commercial</th>
<th>Industry</th>
<th>Enterprise</th>
<th>Community</th>
<th>Other</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT</td>
<td>6 (30%)</td>
<td>6 (30%)</td>
<td>2 (10%)</td>
<td>1 (5%)</td>
<td>5 (25%)</td>
<td>20</td>
</tr>
<tr>
<td>NSW</td>
<td>80 (53%)</td>
<td>19 (13%)</td>
<td>36 (24%)</td>
<td>8 (5%)</td>
<td>7 (5%)</td>
<td>150</td>
</tr>
<tr>
<td>NT</td>
<td>7 (15%)</td>
<td>13 (28%)</td>
<td>2 (4%)</td>
<td>15 (33%)</td>
<td>9 (20%)</td>
<td>46</td>
</tr>
<tr>
<td>QLD</td>
<td>200 (50%)</td>
<td>55 (14%)</td>
<td>75 (19%)</td>
<td>58 (15%)</td>
<td>12 (3%)</td>
<td>400</td>
</tr>
<tr>
<td>SA</td>
<td>29 (33%)</td>
<td>13 (15%)</td>
<td>11 (13%)</td>
<td>34 (39%)</td>
<td>1 (1%)</td>
<td>88</td>
</tr>
<tr>
<td>TAS</td>
<td>29 (41%)</td>
<td>15 (21%)</td>
<td>10 (14%)</td>
<td>11 (16%)</td>
<td>5 (7%)</td>
<td>70</td>
</tr>
<tr>
<td>VIC</td>
<td>55 (19%)</td>
<td>52 (18%)</td>
<td>45 (16%)</td>
<td>120 (41%)</td>
<td>18 (6%)</td>
<td>290</td>
</tr>
<tr>
<td>WA</td>
<td>41 (28%)</td>
<td>19 (13%)</td>
<td>32 (22%)</td>
<td>42 (29%)</td>
<td>11 (8%)</td>
<td>145</td>
</tr>
<tr>
<td>TOTAL</td>
<td>447 (37%)</td>
<td>192 (16%)</td>
<td>213 (18%)</td>
<td>289 (24%)</td>
<td>68 (6%)</td>
<td>1209</td>
</tr>
</tbody>
</table>

Source: Allen Consulting Group, November 1994

Note: No definition of 'other' providers was supplied in the ACG report.

As none of the government recognition authorities collect information about unregistered private providers in their respective States or Territories, it is impossible to determine the relative size of the regulated, vis a vis the unregulated, private training sector. However, an ABS survey (1994) of 170 commercial training providers in December 1993 revealed only 39 per cent of providers were registered with a State Government training recognition authority. Moreover, the ABS survey found that only 25 per cent of commercial training providers were conducting accredited courses in 1993. Although the sample size for the ABS survey was relatively small, it nevertheless suggests that the unregulated segment of the private training market is substantially larger than the government regulated private sector and that registered private providers represent only the tip of the iceberg. However, given that the national rate of registration remained constant at around 55 per cent between September 1992 and September 1994, registered private providers have been increasing steadily as a proportion of the total private training sector in Australia. This would suggest that the establishment of NFROT has been a successful policy initiative to the extent that it was intended to integrate private providers into the national VET system.

In numerical terms, the introduction of NFROT has significantly altered the composition and intersectoral balance of the regulated training market in Australia. In 1993, there were 739 TAFE institutions in Australia providing training to almost 1.8 million students, compared to 1209 registered private providers delivering accredited training to a significant, but as yet indeterminate, student population in September 1994. Assuming that the current rate of registration is maintained, registered private providers are likely to outnumber TAFE
institutions by well over 21 by the end of 1995. This represents a massive proliferation of suppliers of recognised post-school qualifications in Australia over the three year period since the implementation of NFROT, before which time TAFE was effectively a monopoly supplier.

6. Key Characteristics of Private Providers

Aside from the private sector being a major blind spot in the national database on post-school VET provision, empirical data on the key characteristics of private providers in Australia has been extremely limited to date. Recent research, however, has begun to open up the field to closer scrutiny. The following section provides a brief overview of research findings to date about private training providers, as distinct from non-TAFE providers which by definition include adult and community education centres.

A national survey of 188 private training providers (69 per cent of whom were government registered) conducted by the Australian Council of Private Education and Training (ACPET, 1992) found that the major areas of course provision were general computing (12 per cent), office and clerical studies (11 per cent), general management (9 per cent), English language (9 per cent), advanced computing (8 per cent), general sales (6 per cent), marketing (6 per cent), and accounting, food and hospitality, travel and tourism, and general supervision, each accounting for 5 per cent of total course provision. The survey found that private providers are typically small organisations. Eighty per cent of private provider respondents had fewer than eleven equivalent full-time teaching staff and a substantial 61 per cent had five or fewer teaching staff. The two activities in which respondents reported having high involvement were conducting competency-based training courses for fee-paying individuals and export education for overseas students. The areas of lowest reported activity were joint ventures with industry, other private providers, TAFE colleges and Skillshare in descending order.

The 1993 ABS survey of 170 commercial training providers found that training courses were offered most frequently in management and administration (31 per cent), supervision (23 per cent), general computing skills (21 per cent), technical and para-professional courses (18 per cent) and sales and personal services courses (18 per cent). In terms of participant hours, the major areas of training provision were sales and personal service (21 per cent) and clerical/office skills (21 per cent). Nearly half the surveyed providers conducted training in more than one vocational field. Fifty six per cent of respondents indicated that their primary business was the provision of training on a commercial (i.e. fee-charging) basis, whereas the remaining 44 per cent indicated that training was a subsidiary activity. Fifty seven per cent of their courses were undertaken for specific employers, while 31 per cent were conducting courses under government labour market programs. Forty two per cent of respondents reported that total course delivery hours in 1993 amounted to less than 499 hours, while only 14 per cent delivered more than 5000 hours of training. Forty per cent reported training fewer than 100-course participants during 1993. With respect to sources of income, 59 per cent of respondents indicated that most of their revenue was derived from publicly available

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9 The definition of commercial providers employed by the ABS was broader than the NFROT definition in that it included any organisation that provided training on a commercial or fee for service basis, including those which would otherwise be classified as industry or enterprise providers under NFROT.

9
fee-for-service courses. Twenty seven per cent relied primarily on revenue from training for specific employers and 14 per cent derived most of their income from courses conducted under government labour market programs. Sixty six per cent of the commercial providers employed fewer than ten teaching staff.

Notable is the finding that only 44 per cent of provider respondents were operating in the training market prior to 1987, at which time the Commonwealth Government launched its program to reform the national training system. Forty seven per cent of respondents commenced business in the period between 1987 and 1992 when a series of significant policy reforms was introduced, including competitive tendering for government labour market program funds and the now-defunct Training Guarantee Levy. In terms of growth factors, respondents indicated that the lack of investment capital had the most negative impact on their level of training activity.

Conducted in 1992/93, Anderson’s study (1994) of registered commercial providers in Victoria and Queensland found that a majority offered training for a diverse range of occupations and industries, primarily in the services sector, whereas industry and enterprise providers tended to provide training for the more capital-intensive areas of manufacturing industry. Providers of business services training were the largest sub-group, accounting for at least 25 per cent of all registered commercial providers in Victoria and Queensland, followed by providers of training in personal services, especially hairdressing and beauty, who accounted for around 10 per cent. The remaining commercial providers were spread across a broad spectrum of vocational fields including management, tourism, hospitality, computing and aviation. The major factors inhibiting their entry into training for the manufacturing sector were reported to be the traditional domination of trade and technical training by TAFE and the high up-front costs associated with infrastructure development. Exactly half of all registered commercial providers in Victoria and Queensland in October 1993 were institutional providers of off-the-job training, commonly referred to as private or commercial training colleges. The remaining half consisted largely of individual training consultants and small private training organisations.

Beyond this broad picture, the commercial colleges were found to exhibit a range of features which distinguish them from their public sector counterparts, TAFE colleges (see Figure 1).

Figure 1: Distinctive Features of Commercial Training Colleges

* a narrow mission to sell training services to fee-paying clients
* an emphasis on promoting quality in the total training package
* a strong customer service orientation
* flexibility in course organisation and resource management
* specialisation in pre-packaged courses for individual clients
* narrowly vocational courses and concentration on job-specific skills
* a strong practical orientation and an emphasis on developing workplace competence
* shorter course duration and more intensive modes of delivery
* off-the-job training in simulated workplace environments
* an emphasis on professional preparation and workplace acculturation
* job placement services for 'adding value' to training outcomes
* a focus on gaining external recognition from industry and professional bodies
* extensive and sophisticated marketing and promotional strategies
* more direct links to employers and closer relations with industry and business
* financial reliance on fees from individuals

Source: Anderson, 1994
The study found that commercial colleges are tuition-dependent and specialise in the provision of short courses for fee-paying individuals. Although most of the courses were certificate level, increasing numbers of advanced certificate and, to a lesser degree, associate diploma courses were on offer. Tuition fees ranged from $2350 to $7800 per course in 1992/3 compared to equivalent TAFE courses which cost between $390 and $780. None of the commercial colleges studied had any significant involvement in the direct provision of training programs and services for industry or enterprise clients. In general, the commercial colleges concentrated on the provision of training in niche market areas where TAFE provision was non-existent or insufficient to satisfy consumer demand. The colleges were typically small in size, with respect to both student and staff numbers, and were concentrated in metropolitan areas of high demand. Principal client groups were unplaced school leavers, 'career switchers' seeking entry to a new field of employment and 'professional upgrades' pursuing further qualifications to improve their career prospects. In addition, overseas students undertaking language and vocational studies and long term unemployed people enrolling in government labour market programs were significant new client sources. On average, around 80 per cent of college revenue was derived from fee-paying individuals while public funds, primarily for government labour market programs, accounted for around 17 per cent.


In summary, what does the foregoing examination of primary data and secondary research reveal about the current state of information and knowledge about the private training sector and its constituent parts? Clearly, there is a dearth of official statistics about the size and composition of the private VET sector. No comprehensive database on registered and/or unregistered private providers of training yet exists in any State or at national level. Existing collections of data relating to private providers are scattered, limited in scope and lack consistency.

In spite of manifold shortcomings, existing data suggest that the private training sector makes a significant contribution to the quantum of training available to industry and the wider community. The contribution of private sector training has been variously estimated by government training authorities to be in the vicinity of 5 to 10 per cent of post-school vocational education and training. Estimates differ, however, according to the definitions and criteria employed. With respect to participation, the non-TAFE sector accounted for around one quarter of all student enrolments for non-degree post-secondary qualifications in 1993 and about one fifth of all student enrolments in non-university diploma and vocational courses. In relative terms, the contribution of the non-TAFE sector to the pool of post-secondary qualifications gained outside the university and secondary schools sector was just over one quarter the size of the TAFE sector's output. In financial terms, the non-TAFE sector was around one fifth larger than the TAFE sector in 1992. In numerical terms, there are almost twice as many non-TAFE suppliers of publicly recognised vocational qualifications as there are TAFE institutions. Although substantial improvement in the quantity and quality of statistical data is required before a more definitive assessment can be made, it is clear that private providers and the non-TAFE sector as a whole constitute an important segment of the national VET system in terms of finance and participation.

Recent research reflects the diverse range and rapid growth of registered private providers since the introduction of the National Framework for the Recognition of Training (NFROT) in 1992. As a group, private training providers are more heterogeneous than TAFE colleges, a sector known for its diversity. By and large, private providers specialise in training provision for the services sector, particularly business and personal services training. Private sector involvement in traditional trade and technical fields is limited due to the cost of
Infrastructure and the traditional domination of the TAFE sector. Typically, commercial training providers are small-scale, tuition-dependant and demand-driven. Most concentrate on niche market training and respond to areas of unmet demand in the public sector. Other than industry and enterprise providers, few have any significant involvement in the direct provision of training programs and services for industry and enterprises, relying primarily on individual fee-paying clients. Although deriving most of their revenue from private domestic sources, a substantial proportion rely on income from government labour market programs and export education. The research also suggests that much of the rapid growth in private provision in recent times has been underwritten by government policy reforms.

8. Conclusion

In view of the unprecedented significance assigned to private providers in the training reform agenda, the lack of primary data and secondary research on post-school VET provision in the private sector is a cause for concern. First, the dearth of data seriously inhibits the capacity of governments to develop comprehensive VET policy, to coordinate skills formation on a national basis and to improve the balance of participation and distribution of scarce resources between sectors. Without adequate data on the private training sector, it will prove difficult to monitor progress towards achieving national goals for vocational education and training agreed by Commonwealth and State Governments and targets set by the Finn Review (1991) and Carmichael Report (1992) for increased participation in post-school education and training.

Steps are being taken at an official level to fill the gaps in the national database on post-school provision. The Australian Bureau of Statistics (ABS) undertook a survey of 1000 private providers in 1994, the results of which are due to be released in late 1995. The Australian Committee on Vocational Education and Training Statistics (ACVETS) has devised a strategy for collecting data on accredited training from registered private providers on a consistent national basis. Both these collections will yield valuable data on private provision and improve our capacity to plan and coordinate VET provision across the public and private sectors in a more effective manner. However, as DEET (1992b) points out, unless future statistical collections employ data elements which are broadly consistent between sectors with respect to definitions and measures, it will prove difficult to measure efficiency and effectiveness on a cross-sectoral basis.

Secondly, governments need to develop and implement policies which are compatible with the rapid diversification of post-school provision. If government policies fail to take sufficient account of the internal heterogeneity of the private training sector and to differentiate between the various private sub-sectors, they may stifle flexibility and diversity. Although recent research has shed considerable light on the hitherto invisible private training sector, there is a need for more research on its internal structure, composition and functions, and its contribution to national skills formation. Without a more sophisticated understanding of the private sector and its relationship to the public sector, policy makers will remain ill-equipped to make strategic decisions regarding the intersectoral and intrasectoral mix and balance of finance and provision.

In conclusion, therefore, there is an urgent need for further data collection and investigation in this area of vital and growing policy significance. Unless, and until, the information and knowledge bases on private training provision are dramatically improved, governments will continue to frame post-compulsory education and training policy in a relative state of ignorance about a major segment of the national VET sector.
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Bringing in the Operative: Case Studies in Work-Based Training and Micro-Economic Reform

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Abstract

This paper examines the operative as an object of training in the vocational education and training system. Drawing from the historical development of economic and vocational education and training policy, and contemporary case-studies within the automotive and food industries, the paper demonstrates how the operative has been 'brought in' to the publicly recognised credentialling system after marginalisation as a category of unskilled work.

1. Introduction

The operative as an object of credentialled training is a recent phenomenon in Australian vocational education and training (VET). Over much of the century the operative was classified as a category of unskilled or semi-skilled manufacturing work and occupied a space outside the established credentialling pathways taken by tradespeople, middle-level technicians and professionals. Consequently, where operative training occurred it was generally through informal on-the-job training, referred to colloquially as 'sitting next to Nellie', through in-house training, or through non-certificated short courses at technical colleges or private providers.

As recently as 1989 an ABS survey, How Workers Get Their Training, estimated that of all occupational groups, operatives were the least likely to have received any form of training; only 2.24 per cent were likely to receive in-house training (managerial 11.94 per cent), 0.70 on-the-job training (managerial 5.69 per cent); and 0.91 per cent external training (managerial, 9.94 per cent) (Baker and Wooden 1992, p.35). In 1994, in spite of an extended period of reform in training, labour market, access and equity, and industrial reform, nearly seventy per cent of operatives were without formal post-school qualifications (Figure 3, ANTA, 1994, p.17).

On 16 September 1994 Commonwealth, State and Territory VET Ministers ratified Towards a Skilled Australia: A National Strategy for Vocational Education and Training (ANTA 1994). The document maps VET's strategic direction through to 1997 and is a central plank of the Australian National Training Authority (ANTA) Agreement between the federal and state governments to provide a nationally coordinated training response to industrial reform. The strategy will also be used to negotiate State and Territory Training Profiles, which establish public sector funding and training priorities, and to steer national industry training plans developed by Industry Training Advisory Boards (ITABs). Organised around the themes of responsiveness, quality, accessibility and efficiency, the strategy is the culmination of eight years of frenetic and radical reform to Australia's vocational education and training systems (ANTA, 1995, pp.4-5).

Research for this paper forms part of the Australian Research Council (ARC) funded Social Organisation of Educational Practice (SOEP) Project in the Faculty of Education at Monash University.
Figure 1: Percentage of Employed People (Per Occupation) Without Post-School Qualifications

Source: Labour Force Status and Educational Attainment (ABS Cat No 6235.0)

Included in the strategy is provision for the 'bringing in' of operative workers at Australian Standards Framework (ASF) levels 1-3, that describe workplace responsibilities and offer related, publicly recognised credentials from entry level to tradesperson (ANTA, 1994, pp 16-17).

In a report informing the strategy, the Allen Consulting Group (Fitzgerald 1994) recommended concentration on ASF levels 1-3 because 'most of the skills required in industry are operative, trade and technical skills rather than those delivered by the universities' (p 8).

The reforms outlined suggest a number of questions. How and when was the category of the 'operative' constructed? What factors led to the exclusion of operatives from formal training? Conversely, what factors have led to the almost indecent haste in privileging credentialled operative training? What work has already been done to establish operative vocational education and training at the industry and enterprise level? And, are there potential problems in reconciling access and equity objectives with the needs of industry?

This paper responds to these questions at two levels. First, it outlines briefly the development of the workplace category of the 'operative' and locates it within the construction of post-World War Two economic and vocational education and training policy. It suggests that the operative was excluded from credentialled learning after the formal training market was captured by craft unions and professional associations in the early twentieth century, a position reinforced by post-WWII micro-economic reform and the introduction to the workplace of the principles of scientific management. This protection of privilege remained during the period of economic prosperity known as the 'long boom'. Keynesian economic settlement and its tenets of full-employment, tariff protection, low inflation and skill replacement through migration, reinforced a status quo that was challenged only after an escalating series of economic crises dating from the mid-1970s. Consequent economic reform and a paradigm shift which embraced the free-market principles of neo-classical economics were combined, often uncomfortably, with traditional Laborist-interventionist concerns with social justice and equity to produce a
free-wheeling environment of international and domestic competitiveness underwritten by an ‘upskilled workforce’. Following human capital theory’s insistence that investment in skill, including operative skill, would lift productivity, vocational education and training systems were tied tightly to national economic policy ‘Add on’ equity and social justice policies ensured the National Training Reform Agenda (NTRA), as it became known, received wide acceptance from organised labour and the community. Employer acceptance was conditional on guarantees of increased productivity. Second, from this overview, the paper problematises contemporary micro-economic training reform policy by concentrating on its contemporary playing-out within the automotive and food industries. It is suggested that efforts to ‘bring in’ the operative to credentialed training, though initially successful, have to overcome significant, institutionally embedded training traditions before claiming enduring success.

2. Background

Until the late 1980s VET provision was only loosely tied to Australian economic policy formation. Though invoked regularly throughout the century as essential to national efficiency, it rarely featured on the national stage except in periods of defence or economic crisis when limited grants were distributed during and after the two world wars for wartime production and reconstruction training, and during the Depression for youth training. With technical education constitutionally a state matter and the Commonwealth government remaining relatively weak until after its assumption of income-tax collection powers in 1942, VET played a minor role in economic policy construction (Rushbrook 1995).

VET, however, assumed greater significance in the industrial relations arena. Following the establishment of the 1904 Conciliation and Arbitration Act and complementary states’ wages boards (Portus 1973, pp.4-10), unions and employers used the new wage-fixing bodies as forums for the negotiation of the distribution of profit and the definition of skill through the setting of award ‘margins’ (Tsokhas 1984, p.123). Through a simple logic, the industrial groups which established powerful working relationships with the wage determining authorities and institutionalised ‘legal’ definitions of skill were those most likely to maintain a wages edge over those groups denied access and consequently failing to privilege often equal but non-legitimised skills practices (O’Donnell 1984, pp.17-22). Skill, therefore, is rarely a straight-forward demonstration of superior mental or manual ability, it also involves, by implication, complex social, cultural, historical and political factors which are sedimented in work-based values and practices.

Operatives frequently fell into this latter group. Occupied by women, migrants and the economically disadvantaged, they were quickly marginalised from the predominantly Anglo-white-male metals-based craft unions which steered and benefited from frequent national wage cases. Employers gained also from the operative group which was disempowered and poorly paid and subsequently easier to manage (Pocock 1988, pp.5-6). Issues related to class, gender and ethnicity were, therefore, embedded in the very systems created to more equitably redistribute national wealth (Beilharz 1993, p.22). These anomalies were not addressed at a fundamental level until the 1990s.

VET providers further contributed to the marginalisation of the operative through public credentialed structures which supported the maintenance of award-based skill. Driven by traditions which sought private sector acceptance and legitimation of its courses, technical colleges openly courted industrial patronage. An early form of the award-technical college nexus was the development of apprenticeship regulatory authorities which linked on-the-job training with mandated day, night, and later, block release training at technical colleges (Rushbrook 1995, Ch 4).
The institutionalisation and consequent privileging of linkages between awards, skills margins, and publicly recognised credentials contributed to the formation of what Seddon labels 'liberal meritocratic education' (1993, pp.65-86), a de facto agreement between the professions and the skilled labour elites to protect skill and consequent labour market advantage through restricting access to formal education. This informed patterns of labour market participation for most of the century. Elsewhere, Seddon has written that for those outside the enclaves of professional 'education' and skilled trades 'training', liberal meritocracy 'did a disservice to those beyond the frames of the "intellectually able" (and culturally privileged) and the skilled male worker. Those who did not belong to the "education" and "training" hierarchies were "disadvantaged". However, she continues, the progressive institutionalisation of failure as an entry requirement to technical training dented the liberal meritocratic compromise (Seddon 1992, p.7), both problematising and undermining it and leading to tensions which later underscored Laborist arguments about VET access and equity.

At the end of WWII the operative was further distanced from formal skilling and education processes by the consequences of Keynesian macro-economic policy and the introduction to industry of scientific management as both a method of administration and a training technology. Full employment, tariff protection, increased public spending and skill replacement through migration were central public displays of Australia's rendition of the global 'New World Order' of Keynesian economics (Maddock 1987, pp 79-105). Within the new economic settlement a rapprochement between government, employers and unions provided guarantees to skilled workers — and in particular metals based craft unions — to full-time work and preference over newly arrived migrant workers. The guarantees were set into legislation with the passage of the Trademens Rights Regulation Act 1946, which through periodic review over following years regulated entry to the skilled trades of non-domestically indentured tradespersons, including migrants (Tregillis 1969, pp.6-8). In effect, the Act functioned as a skills' gatekeeper which privileged skill and consigned many eligible workers to the operative ranks. Years of post-war industrial turbulence also ensured the protection of skill (Hagan 1981)

Automation, mechanisation and the introduction of scientific management or 'Taylorism' further enlarged the operative ranks through the deskilling of trades and the separation of industrial functions related to product conception (management) and execution (production workers) (Braverman 1974). The fragmentation of work tasks and the introduction of Fordist assembly lines was regarded by many as 'an ideal towards which many Australian managers are striving' (O'Hara 1957, p.7) Management education for supervisors and foremen boomed as the institutionalisation of line-management assumed the status of an exact science (Dufty 1966, pp 177-196).

From the widespread use of Taylorism in large enterprises and the 'scientific' segmentation of the labour, a convention arose to label the four levels of workforce production arrived at as the Operative-Tradesman-Technician-Professional distinction. This stratification was soon reflected in a plethora of government educational reports and conferences, particularly in England. The 1956 and 1961 white papers on technical education, the 1959 Crowther report, and the mid-1960s Haslgrave report and Huddlesfield Conference, for example, all directed vocational education and training providers to cater for the requirements of the 'skilled' tradesmen-technician-professional levels, but neglected to provide for the operative which was defined as a category of unskilled and therefore non-credentialled work. Consequently, while formal operative training remained non-existent the technical colleges of Britain and Australia capitalised on burgeoning markets in trade, middle-level or technician, certificate, diploma and degree courses, which became their stock-in-trade (Argyles 1964, pp 83-102, Hermann et al 1976, pp.225-279).
But while operative training did not figure in technical college training it was seen to play a role within individual enterprises. O'Hara (1962) remarked that jobs which once required 'the full attention of a skilled tradesman have now been broken down into their component operations, each of which can be carried out by a worker who possesses only the specialised skill and knowledge to perform his part of the process'. Such workers, including process operators, assemblers, packers and metalpress operators, comprised, he claimed, the major portion of the manufacturing labour market, and their training was regarded as vital for industrial productivity and efficiency (p.30). The training, however, was non-credentialled and generally involved the behavioural reinforcement of repetitive manual tasks; mental activity was only considered when it contributed to motivation through 'knowing one's place in the sun' (p.37). A 1966 survey of five hundred manufacturing enterprises estimated that of the large firms participating 52 per cent of operatives received technical training (8 per cent executives), 5 per cent received administrative training (34 per cent executives), 7 per cent received training on company procedures (11 per cent executives), and 1 per cent received training in general education (5 per cent executives). Only 16 per cent received some form of external training. Training in medium to smaller enterprises was proportionally less in all categories (Taylor, 1966, pp 27-38).

By the mid-1970s 64.8 per cent of workers in the category 'Tradesmen, production process workers and labourers' (60.2 per cent men, 94.6 per cent women) did not possess a publicly recognised work-based credential (Kangan 1975, p.312). Because the category of 'operative' was rarely disaggregated from that of 'tradesperson', and given the greater legal and industrial protection of craft skill, the percentage of operatives without post-school qualification would be much higher than those suggested. Given also the high number of non-credentialled operatives in 1994 it seems also that a further decade of technical and further education reform under the banner of the Kangan report (1975) failed to address its publicised themes of access, equity and recurrent and lifelong learning, at least for those who fell outside trade preparatory, trade and middle level certificate programs. The introduction of labour market programs following the Cochrane report (1974) seemed also to concentrate on entry to existing skillling programs rather than opening up training opportunities for less advantaged levels of the division of labour (for example, the Commonwealth Rebate for Apprenticeship Full-time Training [CRAFT] scheme).

In 1974 the 'long boom' ended. Rising inflation and unemployment (and in particular youth unemployment), a 25 per cent cut in tariffs by the Whitlam Labor government, and a series of global economic crises ensured the progressive erosion of the Keynesian settlement. Combined with Australia's increasing exposure to the global economy, radical reassessments were required of the manner in which the nation did business. Increasing instability in commodity prices forced a reassessment of 'riding on the sheep's back' as a means of generating export income, secondary and service industries and their production of 'value-added' or 'elaborately transformed' manufactures assumed pre-eminence as national economic salvation (Maddock 1987). No longer, therefore, could the 'Fortress Australia' attitude of industry and labour protection prevail. Though the Fraser government tinkered with economic reform through monetarism, it was not until after the election of the Hawke Labor government in 1983 that fundamental change was initiated (Kelly 1992, p.386), and along with it the redefinition of the relations between access and equity, vocational education and training and workplace productivity. Liberal meritocracy, skills protection, awards and privileged vocational education and training were all placed under the micro-economic reform microscope.

3. The Operative and the National Training Reform Agenda

Under the guise of exposure to the international economy and the rallying cries of 'world best practice' and the 'level playing field', labour market and vocational education and training reforms were tied to policies which called for the de-regulation of national and international markets, the fruits of which, the initiatives proclaimed, promised increased national and
individual prosperity (Dawkins 1988). Invoking human capital theory, public and private investment in worker skilling at all levels was regarded as an essential component of increased productivity (EPAC 1986).

Macro-economic reform provided an opportunity for the elevation of TAFE to the national spotlight, though at the price of major change. In Victoria, for example, the government's economic strategy described current industry training arrangements as 'developed to meet the training requirements of an earlier era'. Reflecting its past constituencies, TAFE was accused of being oriented primarily toward occupations in the manufacturing and construction industries, with little provision for the service or high technology industries, of concentrating on narrowly defined trade or technical skills, rather than broad-based, flexible and transferable skills for all workforce participants; and, significantly, of failing to provide for intermediate skills training 'it severely restricts the flexibility and mobility of the semi and unskilled workforce by constraining access to more advanced levels of skills training and by limiting individual career paths' (Victoria: the Next Decade 1987, p.92) From November 1987 structural changes to TAFE, adult education and industry training addressed the perceived weaknesses of the state's vocational education and training provision.

An early national response to the new economic paradigm came from the Kirby report (1985) While failing to recognise skill entry levels below that of tradesperson, it nevertheless widened the definition of the apprentice to include those young people entering industries other than those served by the traditional craft-award-TAFE nexus and established 'traineeships' which included publicly certified outcomes (Kirby 1985, pp.109-120). It called also for adult entry to the skilled trades, training assistance for the disadvantaged and 'recognition of the skills inherent in traditionally female occupations' (Kirby 1985, Overview, p.5).

But the prime mover of subsequent reform was the report of the overseas fact-finding mission of the Australian Council of Trade Unions/Trade Development Council (Australia Reconstructed 1987) Recognising Kirby's work and the 'active' labour market policies of many European nations, it called for an integration of labour market policy with industry policy, the promotion of skill formation, tripartite development of labour market policy and programs, and the end of labour market segmentation which disadvantaged those who lacked access to rewarding careers (p.122) It was from this point that the operative was progressively 'brought in' to the formal training arena.

In a rare coalescence of government, union and employer resolve, the National Training Reform Agenda (NTRA) grew out of the aftermath of Australia Reconstructed. Though sharing divergent agendas relating to national economic reform and electoral survival, profit and full employment respectively, each of the parties worked toward the radical restructuring of existing industrial and labour market relationships Buoyed by the 1983 Accord which tempered union wage claims and the August 1988 Structural Efficiency Principle (SEP) which sought to restructure traditional workplace practices, including union demarcation, and to provide consistent, coherent work structures based on training and skills acquired, the bureaucratically-managed reforms grew at an ever increasing pace (State Training Board 1988, p.67; Beevers 1993, pp 98-100)

Among a raft of reforms to vocational education and training, including Competency Based Training (CBT), Recognition of Prior Learning (RPL), flexible program delivery, and credit transfer, perhaps the most significant for the entry of operatives to formal training is the establishment of the National Training Board in 1990 (NTB Network, 1991), and its creation of the eight-level Australian Standards Framework (ASF). Within the NTB's National Competency Standards: Policy and Guidelines (1992), the first three levels of the ASF provide descriptors of the responsibilities and competencies required of operatives, with levels 4-6 covering highly skilled craftspeople and middle level technicians, and levels 7-8 covering professionals. Though
written in language which contains Taylorist echoes and currently under revision, the descriptors
nevertheless provide a clear map for credentialled operative progress to higher skill levels, as
well as credentialled recognition of the lower levels. The guidelines, however, explicitly exclude
the ASF levels from links with occupational classifications, which were deemed to 'remain the
prerogative of the industrial parties' (pp 16-18). At the time of writing this issue still remains
a point of negotiation between unions and employers (ANTA 1994, p.10)

Though the operative is now incorporated into the public training and equity policy domains,
there remains a gap between the rhetoric and the reality of the workplace Fitzgerald (1994,
p.36) tellingly writes of 'the apparent lack of strong business commitment to the reforms as
such'. He also writes of the business sector's concern with the NTRA's attempts to link
competency standards and training with industrial relations matters (p.37). How then, are these
traditions and reforms being played out at the workplace?

4. Operative Level Training in Context

The NTRA has sparked much debate for those involved in the VET field, and in particular
within those areas contextually defined as 'education' and 'training' and their inter-relationships.
While the major debates surrounding NTRA reforms are turning to the evaluation of
effectiveness, an area where reform success has been claimed is operative training. A closer
examination of the systems used to implement operative reform, however, is required to assess
whether or not the claims to success are merely smoke and mirrors or the beginning of enduring
structures.

To do this the NTRA should be seen as part of a broader agenda that is attempting to bring
about workplace change. In 1987 the federal government established the Department of
Employment, Education and Training (DEET) and institutionalised the need to manage
micro-economic reform through the ministerial coordination of workplace restructuring,
employment, labour market reform, and general and vocational education and training. John
Dawkins was the minister of choice to head the new 'mega' department and moved to the
position shortly after managing the production of Australia Reconstructed while serving as
Minister of Trade

DEET, with the Department of Industrial Relations under Peter Morris and later Senator Peter
Cook, and the Hawke/Keating leadership vigorously pursued the new reform agenda. The SEP,
in particular, provided a first link between the workplace, training and publicly-recognised
credentials. SEP wage increases were dependent on the industrial parties demonstrating
improvements in productivity. To achieve results in this new era of industry-organised labour
rapprochement, unions, sometimes reluctantly, agreed to undergo a complex process of
award restructuring under which traditional industrial classifications were rationalised and modernised
Changes focused on broadening occupational categories, or 'broadbanding', and reducing the
number of unions. The rhetoric included employee 'multiskilling' and a demand for employers
to upgrade work-based technology and management practices. At the same time, efforts were
also made to create employee career paths through defining work responsibilities at a number
of credentialled levels. Leading reform were the metals-based industries.

The interface between award restructuring, the SEP and the NTRA produced two important
outcomes which have the potential to provide long term advantage to the operative first, the
industrial aspects associated with the moves to document operative
tasks/functions/responsibilities at a number of levels within specific occupations; and second,
the subsequent moves to 'bring in' the operative to the publicly recognised credentialling system.
The strategy is a representation of the two fragile agendas of contemporary industrial reform:
for employers — productivity, efficiency and profit; and for workers — career and increased wages.

In April 1989 Dawkins released *Improving Australia's Training System* which mapped industrial and training reform priorities. Among these were calls for increased national investment in training and improvements in its quality, flexibility, consistency and coordination (Curtain 1994). The report was followed by two conferences convened and attended by federal, state and territory ministers who held responsibility for vocational education, employment and training, known collectively as MOVEET or the Ministers of Vocational Education and Training. The group was a further reminder of the federal government's commitment to address evident national training inconsistencies, and also of its difficulty in attempting to manage a sector which remained constitutionally a state responsibility.

Meanwhile, an older educational forum, the Australian Education Council (AEC) commissioned a tripartite report chaired by Brian Finn which reported its findings in *Young People's Participation in Post-Compulsory Education and Training* (1991). A key recommendation of the group related to the construction of 'key competencies' or learning outcomes relating to the immediate and future skills and knowledge a person would need to enter the world of paid work. A further group, chaired by Eric Mayer, was established to refine the concept (1992).

In yet another place, the National Board of Employment, Education and Training's Employment Skills Formation Council (ESFC) began its work into investigating and developing a systematic approach to education and training for operative and entry level employees. The group was chaired by ESFC chair and ACTU Assistant Secretary Laurie Carmichael, regarded as one of the architects of work-based reform. Its report, the Australian Vocational Certificate Training System (*The Carmichael Report* 1992), provided a common platform for work-based learning and the Finn and Mayer outcomes.

In July 1992 MOVEET identified the essential elements of the NTRA through advocacy of six goals:

1. Develop a national vocational education and training system in which publicy funded private and industry providers can operate effectively, efficiently and collaboratively and which meets the needs of industry and individuals.

2. Improve the quality of the outcomes of vocational education and training.

3. Improve vocational education and training opportunities and outcomes for individuals.

4. Improve the ability of the vocational education and training system to respond to the current and future needs of industry.

5. Improve access to and outcomes from vocational education and training for disadvantaged groups.

6. Improve public awareness of the value of vocational education and training as an investment for both industry and individuals (Attachment A in Lundberg 1994).

While much talk focuses on the NTRA it is important to note that no such agenda formally exists. In fact, some commentators now talk about national training reform agendas, acknowledging the various stakeholders and powerbrokers at work within the system constructing multiple training outcomes. For example, Lundberg argues that the NTRA comprises a nationally consistent Competency Based Training system, national recognition of competencies,
however defined (for example, Recognition of Prior Learning), an open training market, fair
participation in VET, and an integrated training system. Curtain, however, refers to seven
NTRA outcomes: the development of competency standards by industry and the associated
curriculum development to reflect competency outcomes, the development of the Australian
Standards Framework for VET credentials, the establishment of the National Training Board
(NTB) in 1990, agreement on a National Framework for the Recognition of Training (NFROT),
the generation of reports on issues related to training and its implications for industrial
relations, the need for curricula which emphasise general and core competencies, the
establishment of Carmichael inspired Australian Vocational Certificates and pathways in the
transition from school to work, and the establishment of the Australian National Training
Authority (ANTA) (Lundberg 1994, Curtain 1994)

Within this complex interpretation of the NTRA, the role of the NTB and its establishment of
the ASF are central to the legitimation of open training. The NTB’s well publicised charter
to assist and endorse competency standards constitutes a central imperative for reform, it
underpins the major aspects of industrial relations and training innovation, and links them with
the VET sector, including TAFE, adult education, work-based training and education, and
private provision. To ensure cross-industry consistency, the NTB has set in place guidelines for
curriculum content and development. Essential to this process is its proclamation that the
concept of competency must focus on what is expected of an employee in the workplace rather
than on the learning process itself, and must also embody the ability to transfer and apply
skills and knowledge to new situations and environments. In other words, training should emphasise
measurable outputs rather than learning inputs (NTB 1992, p 29)

The NTB emphasises that it has intentionally framed a broad concept of competency. For
example, it emphasises that competency standards must encompass task skills, task management
skills, contingency management skills, and job/role environment skills. Like much of the NTRA,
the standards are derivative, in this case from Mansfield and Mathews in the UK (1985). In
addition, reflecting the NTRA, the standards should also relate to realistic workplace practices,
and be understandable to trainers, supervisors and potential employers.

The format for standards comprises a Unit of Competency which is made up from elements of
competencies, performance criteria, range and variable statements, and evidence guides. The
ASF is used as a ‘benchmark’ guide to ensure competency compatibility across industries.

Of the eight ASF levels, levels 1 and 2 are considered entry level. It is at these two levels that
most operatives and production workers are designated. Level 3 is considered to be equivalent
to a base trade level. Employees who in the past completed an apprenticeship, are considered
typical of this level. However, as trade apprenticeship, with exceptions such as hairdressing,
have mainly been associated with male workers, the term ‘equivalent to base trade’ has assumed
significance as an equity mechanism.

One of the major gender equity reform mechanisms associated with the workplace is to
implement processes that will allow women workers to be recognised as doing equivalent work
to males, thus challenging sedimented skill-definition processes established earlier in the century.

Level 4 of the ASF is again often expressed in terms of the male-familiar terms ‘technician’ or
‘advanced trade’ classification, particularly as used within the metals and engineering industries.
Similarly, Levels 5 and 6 are considered to be equivalent to paraprofessionals. These typically
include VET graduates in fields such as food technology, child care workers, accountants and
office supervisors. ASF levels 7 and 8 are reserved for the professions, typically those who
graduate with a university-based degree.
Given the essentially gendered and Taylorist descriptions of the ASF levels, the ramifications for occupational categories are highly problematic. One example is the highly gendered occupation of nursing; another is the operative or production workers who often are the subject of multiple oppression and prejudice; because of inequalities related to social and economic class, gender, ethnicity and age, both groups experience reduced labour market opportunities.

The Carmichael report was the result of a committee looking to systematise training and credentialling for occupations at ASF levels 1-4, though most of their work related to levels 1-3. The AVC's offer an umbrella framework that attempts, for the first time, to recognise and formalise operative skill formation. It adopts as its most immediate priorities the development of national competency standards related to the ASF, the training of teachers and trainers to deliver and assess using CBT, and the preparation of industry training plans.

5. Operative Training

Employees working as operatives and production workers are typically aligned to ASF levels 1 and 2, but in some cases they are also considered to be level 3. The NTB descriptors for each of these levels are as follows.

**Level 1**

Work is likely to be under direct supervision with regular checking, but may take the form of less direct guidance and some autonomy where working in teams is required.

Competency at this level involves the application of knowledge and skills to a limited range of tasks and roles. There is a specified range of contexts where the choice of actions required is clear.

Competencies are normally used within established routines, methods and procedures that are predictable, and within which judgement against criteria is also involved.

**Level 2**

Work is likely to be under routine supervision and intermittent checking, but may take the form of general guidance and considerable autonomy where working in teams is required.

Responsibility for some roles and coordination within a team may be required.

Competency at this level involves the application of knowledge and skills to a range of tasks and roles. There is a defined range of contexts where the choice of actions required is usually clear, with limited complexity and choice.

Competencies are normally used within established routines, methods and procedures, in some cases involving discretion and judgement about possible actions.

**Level 3**

Work is likely to be under limited supervision with checking related to overall progress, but may take the form of broad guidance and autonomy where working in teams is required.

Responsibility for the work of others may be involved, and team coordination may be required.
Competency at this level involves the application of knowledge with depth in some areas and a broad range of skills. There is a range of tasks and roles in a variety of contexts, with some complexity in the extent and choice of action required. Competencies are normally used within routines, methods and procedures where some discretion and judgement is required in selection of equipment, work organisation, services, actions and achieving outcomes within time constraints (NTB 1992, pp 17-18).

Prominent among the Carmichael initiatives has been the development and implementation of accredited operative training, notably the Engineering Production Certificate (EPC), the Vehicle Industry Certificate (VIC), and the National Certificate of Food Processing (NCFP). In many ways the structure of these courses represent a form of Carmichaelism as the course designs and structures are representative of the ESFC scheme. Stephens and Bertone set the scene for the collective certificates' achievements:

> At the Ford Motor Company, unions and management were successful in pioneering the first structured TAFE accredited certificate for production workers, the Vehicle Industry Certificate, which is linked to the award. Similarly, the Engineering Production Certificate has been developed in the Metals and Engineering industry and the food manufacturing industry has introduced the National Certificate of Food Processing for production workers (Jenny Stephens and Santina Bertone 1995, pp 17-18)

The following outlines the basic elements of each program.

6. **The Vehicle Industry Certificate**

The VIC was developed in 1990 for the 60 per cent of the industry who are employed doing assembly and production work. These workers have traditionally been designated as non-trade operators and production workers. Sefton, Waterhouse and Deakin (1994) explain that the original syllabus was divided fairly arbitrarily into levels 1, 2 and 3 and that this translated directly into modules of training materials developed by TAFE (p.24). According to the authors:

The VIC was accredited in Victoria in 1990. This TAFE certificate course was unique at the time. It was the first course developed by industry to meet its own training needs and accredited by TAFE, thus acknowledging the portability of skills and knowledge of employees across the manufacturing industry. It recognised the training needs that lay outside the traditional skills curriculum. Although the skills and knowledge learning outcomes were separated, it represented a giant leap forward in attempting to meet the requirements of the shop floor workers who had been denied any form of training recognition.

One of its strengths has been its flexibility whereby people from a wide range of work areas have been able to develop the skills they require for their work within the framework of an accredited TAFE certificate course (p 17).

The VIC consists of a nominal 400 training hours. However, as all accredited training is competency based, this is written as 'equivalent' to the achievement of learning outcomes which are equal to 400 points (the provider, nevertheless, is funded for 400 student contact hours). The VIC is divided into 200 knowledge units and 200 skill units. Some skills units are also assessed from workplace performance. Trainers facilitate this process through a system of job rotation. Sefton believes that on completion of the VIC, participants exit at between ASF levels 2 and 3.
Sefton, Waterhouse and Deakin provided six case studies of integrated and contextualised training based on the VIC in their groundbreaking report *Breathing Life into Training*. The studies revealed a holistic and creative approach to curriculum development and training, much of which developed from the ashes of the critique of the instrumental module-driven delivery of the VIC.

7. **The Engineering Production Certificate**

Much discussion has been instigated through the development and implementation of the reform agendas. Some of this has been critical of the prominence of the male dominated metals and engineering industries. For many people this industry is seen as too influential and formative of the structures being developed. It was the first to undertake major restructuring activities which in part arose from a sectoral downturn. The industrial parties came up with a classification structure from C14 at entry level to C10 at base trade 'equivalent'; C7 is rated as equivalent to technician/advanced trade 'equivalent', while C1 equates with factory managers and professional engineers. Under the metals structure, C14-C11 are benchmarked as equivalent to ASF levels 1-2.

The EPC was developed in 1990 and consists of three levels, each of which equates with ASF levels 1-3. The re-organisation and full modularisation of the existing trade courses developed during 1989-1990 provided substantial groundwork for the development of the EPC. The trade training associated with apprenticeship and the reaching of tradesperson status is achieved after successfully completing 24 modules which each have a nominal duration of 40 hours (thus, ASF level $3 = 24 \text{ modules} = 960 \text{ nominal hours}$). This is an agreed benchmark throughout the industry. Conversely, level 3 of the EPC is equivalent to the completion of 24 modules of the same nominal duration. Level 1 in the EPC becomes one third of this at the completion of 8 modules. The Engineering Skills Training Board (ESTB) reports that by the end of 1991, just five months into the trialling of the level 1 nationally, some 100 modules had been developed for the EPC (ESTB 1994, p 6). With 75 per cent of workers in the metals and engineering industry, the EPC provides a first opportunity for operative level employees to enter the C14-C1 work-based learning process (Stephens and Bertone 1995).

8. **National Certificate of Food Processing**

After the release of *Australia Reconstructed* there were a number of other similar fact-finding missions. The metals and engineering industry sent a mission to the United Kingdom, Sweden and West Germany in September 1988 and compiled *Towards a New Metals and Engineering Award* which was released in December 1988 by Minister Morris. Likewise, the food industry, following a tripartite visit to Switzerland, Italy and West Germany, released *Ingredients for Change* in December 1989. Among its recommendations were that:

A new classification of food processing tradesperson be created with equivalent status to that of existing food trade classifications; that existing classifications be restructured and provide for both vertical and horizontal career paths which will be accredited by a 'passport' certificate; that immediate steps be taken to develop a curriculum for a recognised trade of food processing tradesperson; and to improve the 'training ethos' (p 27).

The food industry is the largest sector of Australia’s manufacturing industry (VFITB 1992, p 45), employing approximately 16 per cent of total manufacturing industry employees. Significantly, as reported by Stephens and Bertone, 'the VFITB in 1992 stated, the lack of structured training for workers at operator level was the single major problem in the food industry (1995, p 39)'.
Competency standards for the general food products sector were endorsed by the NTB in 1993. The National Certificate was accredited soon after. The broad structure of the competency standards developed by the industrial parties is outlined in Table 1.

**Table 1: Structure of Document**

<table>
<thead>
<tr>
<th>ASF</th>
<th>General Foods Manufacturing Industry Level</th>
<th>Broad Structure of Competency Levels</th>
<th>Level of Supervision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>• Induction/orientation</td>
<td>Direct supervision</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>• Manual handling operations</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Operate simple automated processes</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Clean equipment</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>• Prepare and monitor more than one packing line or an entire production line</td>
<td>Minimal supervision</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Apply advanced technical skills</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Fumigate stocks and property</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Test product (in-process)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>• Co-ordinate a production sub-system or packaging system/line</td>
<td>Limited supervision</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Control movement of raw materials, consumables and finished stock</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>• Plan and monitor complex production processes</td>
<td>Minimal supervision/ supervises others</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Oversee the performance of the production/packaging system</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Co-ordinate routine preventative maintenance(1)</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>• Prepare and monitor more than one packing line or an entire production line</td>
<td>Minimal supervision</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Apply advanced technical skills</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Fumigate stocks and property</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Test product (in-process)</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>7</td>
<td>• Operate a section of a packing line</td>
<td>Routine supervision</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Operate a production sub-system</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Perform cleaning and minor routine maintenance (2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Operate forklift vehicle/equipment</td>
<td></td>
</tr>
</tbody>
</table>

Note (1): This is described in more detail at the commencement of each level of competency.

Note (2): This function will depend on site agreement as to responsibility of production operator.

The model for competency based training Portrays the development of outcome standards as a first step (Wheeler 1993, p. 40). The standards become the basis for the training response.
which initially means the design and development of a course usually organised as modules. In this case also the National Certificate was designed to include three levels, each corresponding to ASF levels 1-3. The course design allocates a range of points for each level with one point equivalent to a nominal student contact hour. Successful completion of a competency based module that has a nominal duration of 40 hours equals forty points and a 20 hour module equals 20 points.

Eligibility for the award of a Certificate of Food Processing is the attainment of 900 course points within the provisions in the structure. The points structure in Table 2 is designed to obtain an overall consistency in the framework while at the same time allowing for differences between industry sectors: as identified when the competency standards are translated into training modules. All generic (core) modules are compulsory; the minimum points a person is required to accumulate at any level is 200, and the maximum allowable in any one level is 500 points.

Table 2: Certificate of Food Processing Award

<table>
<thead>
<tr>
<th>Competency Level</th>
<th>Course Points (1) (Range for ASF Level)</th>
<th>Points Structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASF3</td>
<td>200 - 500</td>
<td>Generic (core)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Generic (optional)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Up to 150 pts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Max. 15% of studies at the ASF level may be enterprise specific</td>
</tr>
<tr>
<td>ASF2</td>
<td>200 - 500</td>
<td>120 pts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Max. 15% of studies at the ASF level may be enterprise specific</td>
</tr>
<tr>
<td>ASF1</td>
<td>200 - 500</td>
<td>150 pts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Max. 15% of studies at the ASF level may be enterprise specific</td>
</tr>
</tbody>
</table>

Notes: (1) The modules are designed on a competency based model identifying the learning outcomes and performance criteria. The inclusion of a points system in the structure is for planning purposes and to assist achieve consistency in the value of options within the course. The allocation for a module is based on the estimate of a reasonable time to undertake the course by formal instruction — allowing one module point for each hour of formal face-to-face instruction.

(2) The enterprise specific allocation may be varied within an ASF level with the provision that a maximum of 140 points is allowable for the total course.

Course developers have detailed learning outcomes for each of the modules and the levels at which each is offered. Set out in a curriculum/accreditation document, the modules provide an exact specification for the credential, in this case they are arranged into streams to provide for the industry's diverse occupational structures. Table 3 outlines this variation of the operative skilling process.
Table 3: Certificate in Food Processing (General Foods)

<table>
<thead>
<tr>
<th>ASF</th>
<th>Generic (Core)(1)</th>
<th>Generic (Optional)(2)</th>
<th>Specialised(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Industrial Communication D (40)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Occupational Health and Safety C (20)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Quality Assurance C (40)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hygiene and Sanitation C (20)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Industrial Communication B (20)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Industrial Communication C (20)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Occupational Health and Safety B (20)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Quality Assurance B (20)</td>
<td></td>
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<tr>
<td></td>
<td>Hygiene/Sanitation A (20)</td>
<td></td>
<td></td>
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<td></td>
<td>Industrial Communication A (40)</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Occupational Health and Safety A (40)</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Quality Assurance A (30)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: (1) The Generic (Core) modules have been accredited as interim, pending the outcome of the NFITC Core Competencies Project.

(2) The Generic (Optional) modules are the programs developed to date. It is expected that the range will be extended when further competency standards information is available. Some revision may be required: results of the NFITC Core Competencies Approved modules may be used from other accredited courses. The modules selected are those agreed to by the enterprise and learner as being relevant to the organisation and the individual's skill formation.

(3) In General Foods specialised modules have been designed so that they can be customised to the particular sector.

(4) The Enterprise Specific Modules have been included for illustrative purposes—they are included for illustrative purposes only. The actual inclusion will depend on whether enterprises use this option. The maximum value allowable for enterprise specific modules is 140 points.
Under enterprise agreements, the industrial parties within each company can negotiate a course structure based on modules which they choose as most appropriate to their specific needs. An example of an enterprise response appears in Table 4 below. Interesting points to note from this Table are: the benchmarking, this includes the Food Operators classification structure to the ASF levels and the inclusion of the Metal Trades award classifications (acting as an easily recognisable and national yardstick); the selection of modules which align to the needs of the enterprise and their allocation to a specific level, also note the inclusion of modules from beyond the national Certificate in Food Processing, in this instance drawn from the EPC.

9. Conclusion

This outline of the journey of operative training towards publicly recognised certification is one of essential optimism. Out of a post-war Taylorist gloom a disempowered category of worker, variously ignored by labour aristocrats and exploited by unscrupulous employers, developed a voice which through persistent advocacy enabled the bridging of an institutionalised credentialling chasm. From the late 1980s, in particular, industrial reform, the NTRA and the consequent work of organised labour, employers, bureaucrats and educationists share responsibility for 'bringing in' the operative to the newly established national certification system. Inclusive equity provisions, the hallmark of a socially democratic national government, ensure the fair application of eligibility criteria to all employees.

Such optimism, however, must be tempered with caution. Micro-economic reform and the training reform agenda have not yet revealed how operative reform has been played out as lived experience in the workplace, the disadvantages generated by class, gender and ethnicity are not solved simply through well-intentioned statements on training and equity. In addition, credentials are no sure-fire guarantee of satisfying or sustained employment, nor are they enduring bargaining tools for future employment, recent evidence, for example, suggests that formal credentials are losing their bargaining power relative to income and employment security (Marginson 1995). Finally, there are the fundamental differences of the reform agendas' tripartite parties, each one of which has the potential to curtail operative reform. Organised labour seeks a maximisation of employee conditions and accord derived wage justice, employers seek profit maximisation in the name of efficiency and effectiveness, often at the cost of individuals' workplace longevity, and governments seek electoral survival through employment and income maintenance, and through employer prosperity. While an existing but fragile balance between the parties continues in the name of national survival and international competitiveness, the position of the operative is likely to improve; but given the invocation of retrograde labour market traditions, political caprice or shifts in the international tide, the work of the past few years could be rapidly undone.
Table 4: Food Processing Certificate: Career Structure for Food Operatives

<table>
<thead>
<tr>
<th>Food Processing Operators</th>
<th>Enterprise Specific Modules Including EPC</th>
<th>Pts</th>
<th>General (Optional)</th>
<th>Pts</th>
<th>General (Core)</th>
<th>Pts</th>
<th>Metal Trades Award</th>
<th>ASF</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Computing - Advanced</td>
<td>20</td>
<td>Quality Assurance C</td>
<td>20</td>
<td>C9</td>
<td>4</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Intro to Food Tech - Biology</td>
<td>20</td>
<td>Industrial Comms C</td>
<td>40</td>
<td>C10</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Intro to Food Tech - Chemistry</td>
<td>20</td>
<td>OH &amp; S C</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>OH &amp; S First Aid - Level 3</td>
<td>40</td>
<td>Hygiene and Sanitation D</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Production Training EPC08</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Calculations C</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Workplace Assessor</td>
<td>40</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Cartoning EPC</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Automated Process EPC72</td>
<td>40</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>Packing C</td>
<td>40</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Forklift Training - Refresher</td>
<td>20</td>
<td>Hygiene and Sanitation C</td>
<td>20</td>
<td>C11</td>
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<td></td>
<td></td>
<td></td>
<td>Production Training EPC05</td>
<td>40</td>
<td>Hygiene and Sanitation B</td>
<td>20</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Form, Fill and Seal EPC</td>
<td>40</td>
<td>Industrial Comms B</td>
<td>40</td>
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<tr>
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<td>Forklift Training B - Licence EPO89</td>
<td>40</td>
<td>Quality Assurance B</td>
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<td>Packaging B</td>
<td>40</td>
<td>OH &amp; S B</td>
<td>20</td>
<td></td>
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<td></td>
<td></td>
<td>Materials Handling B</td>
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<td></td>
<td>Cleaning and Sanitation B</td>
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<td></td>
<td></td>
<td>Computing - Intro EPC50</td>
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<td></td>
<td></td>
<td></td>
<td>Confined Space Training</td>
<td>30</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>First Aid - Level 2</td>
<td>20</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Calculations B</td>
<td>20</td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Material Handling C</td>
<td>40</td>
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<td></td>
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<tr>
<td></td>
<td></td>
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<td>Forklift Training A - Pallet</td>
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<td></td>
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<td>C13</td>
<td>1</td>
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<td>Calculations A</td>
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<td>C14</td>
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<td></td>
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<td>Packaging A</td>
<td>40</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Industrial Communication A</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>Quality Assurance A</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>OH &amp; S A</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Induction</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**Notes:**
- ASF: Award Structure Framework
References

* Note: the authors have retained the word ‘operative’ as the accepted policy and industry term used to describe those men and women who undertake production, machine and process work. It would be our preference, however, to replace ‘operative’ with ‘operator’ as this deliberately renames the category and removes it from a skills hierarchy which is rarely problematised


National Training Board (1991), *Network*, No 1, National Training Board Inc, June


*Victoria The Next Decade*, (1987), Victorian Government Printer, Melbourne


34
Some Aspects of the Economic Evaluation of Vocational Education and Training

Gerald Burke

Monash University-ACER Centre for the Economics of Education and Training

1. Introduction

Evaluation of an activity can take a range of forms. House (1980) provides a taxonomy of eight approaches which range from cost-benefit analysis to self study, interviews and observations. The appropriate form of evaluation may vary with the purposes of the evaluation and the available data:

- evaluations can be summative, to judge the outcome and report to funding bodies on success or failure,
- evaluations can be formative and have a role in changing a program during its ongoing implementation

Cost-benefit analysis involves estimating the costs of a program in money terms and comparing them with the benefits also in money terms. It tends to be most useful in summative evaluations and usually does not offer much insight into the process by which the inputs are turned into outputs. That is, it can help in identifying successful programs, but to find why they are successful will usually need other methods of investigation. Hence case studies involving interviews and observation may also be necessary (e.g. Smith 1993).

This paper provides a brief overview of some of the issues involved in economic evaluations. It does not attempt to be comprehensive. First it reviews current data on the total costs/expenditure on education and training and raises the possible dangers of focusing evaluation on education and training rather than on skills and knowledge. Secondly it provides a resume of the major problems in measuring benefits by the addition to earnings associated with education and training. Thirdly it considers some aspects of the task of estimating costs.

2. Expenditure on Education and Training

Government outlay on education in 1992-93 was estimated at $21 billion or 5.3 per cent of GDP. Of this $21 billion, more than half is spent on primary and secondary schooling but over $2 billion was spent on TAFE, over $4 billion on higher education and nearly $1.8 billion on student assistance. Recent data on private expenditure on education are not available, but it is likely to be around 0.5 per cent of GDP.

Government expenditure on labour market programs, of which a substantial part is for training, now approximates 0.5 per cent of GDP. Employer expenditure on formal training, on the basis of the 1993 ABS survey Employer Training Expenditure Australia, is estimated at...
$1.1 billion for a three month period or nearly $4.5 billion per annum — over 1 per cent of GDP. Of this expenditure on training nearly half (46 per cent) represents expenditure on the wages and salaries of those undertaking training and just over half represents the cost of trainers and other expenditure. Employer expenditure on trainers and other training expenditure is of roughly the same magnitude as government expenditure on TAFE.

Some further detail on employers' expenditure is given in Table 1. On average nearly 3 per cent of payroll is spent on training. This represents $192 per employee for the three months July to September 1993 or over $750 per year per employee. Expenditure per employee who received training would be much higher. The ABS expenditure survey did not provide an estimate of the numbers being trained, but its 1989 survey of How Workers Get their Training showed about 35 per cent of persons who had a job in the previous 12 months had received in-house training. In-house training absorbed nearly 70 per cent of all training expenditure in 1993, so a rough estimate of expenditure per employee receiving in-house training would be $1500.

Table 1: Employer Expenditure on Formal Training(I) (Australia, July-September 1993)

<table>
<thead>
<tr>
<th>Size of Employer</th>
<th>Number of Employees</th>
<th>1-19</th>
<th>20-99</th>
<th>100 or more</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Expenditure ($m)</td>
<td>112.3</td>
<td>177.8</td>
<td>818.8</td>
<td>1108.9</td>
<td></td>
</tr>
<tr>
<td>% of Gross Wages</td>
<td>17%</td>
<td>2.7%</td>
<td>3.2%</td>
<td>2.9%</td>
<td></td>
</tr>
<tr>
<td>in-house</td>
<td>0.9%</td>
<td>1.5%</td>
<td>2.4%</td>
<td>2.0%</td>
<td></td>
</tr>
<tr>
<td>external</td>
<td>0.8%</td>
<td>1.2%</td>
<td>0.8%</td>
<td>0.9%</td>
<td></td>
</tr>
<tr>
<td>% of Employers Reporting Expenditure</td>
<td>18%</td>
<td>80%</td>
<td>98%</td>
<td>25%</td>
<td></td>
</tr>
<tr>
<td>Expenditure per Employee ($)</td>
<td>86</td>
<td>180</td>
<td>236</td>
<td>192</td>
<td></td>
</tr>
<tr>
<td>Private Sector ($)</td>
<td>85</td>
<td>180</td>
<td>208</td>
<td>163</td>
<td></td>
</tr>
<tr>
<td>Public Sector ($)</td>
<td>(2)</td>
<td>178</td>
<td>267</td>
<td>263</td>
<td></td>
</tr>
<tr>
<td>Number of employees — million</td>
<td>1.31</td>
<td>0.99</td>
<td>3.47</td>
<td>5.77</td>
<td></td>
</tr>
<tr>
<td>Hours per Employee</td>
<td>4.1</td>
<td>5.3</td>
<td>6.2</td>
<td>5.6</td>
<td></td>
</tr>
<tr>
<td>For Employers who report expenditure</td>
<td>13</td>
<td>6</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

Source: ABS, Employer Training Expenditure, Australia July-September 1993 (Cat No. 6353.0)

Notes: (1) **Formal Training.** All training activities which have a structured plan and format designed to develop employment related skills and competencies are defined as formal training. It consists of periods of instruction, or a combination of instruction and monitored practical work. The instruction can take the form of workshops, lectures, tutorials, training seminars, audio-visual presentations, demonstration sessions or self-paced training packages.

(2) Sample size too small to report estimate.

These aggregate estimates of expenditure at best provide an indication of the dimension of training. They are useful in indicating the level and broad types of training undertaken by firms of different size in various industries. Even in this regard they provide only partial estimates for the whole labour force. Table 2 shows the labour force in August 1993. Total
employment in August 1993 as estimated in the monthly population survey was nearly 77 million, whereas employees (estimated numbers who received pay for any part of the last pay period ending on or before 20 August 1993) were shown at 5.8 million in Table 1. The main reasons for the difference between the number of employees and the total labour force is the number of self employed persons which totalled 0.9 million, employers 0.4 million and the fact that wage and salary earners (which includes some persons on leave without pay) exceeds the number of employees. Expenditure on the members of the labour force not classified as employees would not be covered by the survey of employers.

In passing it may be noted that 60 per cent of employees are shown in Table 1 as employed in firms with 100 or more employees. For the private sector only about 45 per cent of employees are with employers with more than 100 employees. And small and medium businesses include many employers and all the self employed who are not included in Table 1.

| Table 2: Employed Persons by Status of Worker, August 1993 (000s) |
|---------------------|---------------------|---------------------|---------------------|---------------------|
|                     | 1 Employers (a)     | 2 Self Employed     | 3 Wage and Salary Earners | Cols 1+2+3 | Total (a) |
| Males               | 246                 | 593                 | 3563                 | 4403         | 4432      |
| Females             | 117                 | 276                 | 2820                 | 3214         | 3253      |
| Total               | 363                 | 870                 | 6383                 | 7616         | 7685      |

Source: ABS, The Labour Force August 1993 (Cat No 62030)

Note: (a) Total includes unpaid helpers

A very important source of learning is explicitly not considered in the Training Expenditure Survey. As the Australian Bureau of Statistics notes: "Informal training is excluded from the scope of this survey. That is, any unstructured on-the-job training, being shown how to do things as the need arises, learning by doing a job" (ABS Cat No 6353.0 p.34).

The 1989 survey of How Workers Get their Training showed that 73 per cent of wage and salary earners had received on-the-job training. The fact that we can measure expenditure on education and on structured training should not lead to the neglect of, say, work organisation that promotes on-the-job training. The importance of on-the-job training is stressed in a recent OECD report:

Learning-by-doing, while the most prevalent kind of work learning is also the most invisible and the least documented. What matters is this indication of an average man or woman's formidable capacity for self-directed learning which could be better exploited to promote more work-related learning. Trial and error, figuring things out, has always been a major mode of skill formation. But firms can nurture it deliberately by reorganising work. Decentralisation and networking make it necessary to enrich jobs with a greater range of tasks and responsibilities, including deliberate upskilling tactics like task rotation. The net effect of such changes is to greatly increase the drive toward and scope for work-led skill formation — and for more
training led skill formation. ..... It is important to remember that to manage skill supply is to manage the entire human resource function, and not just training (OECD 1993, pp.30-31).

The Finn report in 1991 in its first chapter stated "the concepts of working and learning will converge. Ongoing learning will become a part of productive work" (Finn 1991 p 6). If this is taken seriously then evaluations of skill formation must take account of informal learning. A number of aspects of skill formation in enterprises are discussed in Burke et al., 1994, Section 3.

Some degree of emphasis on evaluating formal training can be defended, however Sloan (1994 p 103) notes that another OECD study argues for the importance of formal company training on the grounds that on-the-job training tends to involve experience with existing technology and that formal training programs are indicators of how seriously firms are preparing workers for changes in production techniques. The importance of training to adapt to new technology and respond to economic change is emphasised by Fitzgerald (1994). Chapman and Stemp (1992) examine the relevance of training to the diffusion of technology.

3. Problems with Benefits in Cost-Benefit Analysis

In the case of vocational education and training it may appear straightforward that cost-benefit analysis is appropriate. This approach involves estimating the costs and benefits to an individual, an enterprise or to society as a whole. Maglen in a number of papers has reviewed the assessment of returns to education (e.g. Maglen 1993 and Maglen et al 1994). He notes that much of the work relates to investment by individuals or by society as a whole. Little work from the perspective of the firm has been reported in the academic literature.

The major approach is to measure benefits by the additional income over a lifetime associated with the additional education and training. This is meaningful from the perspective of the individual and the society. The reason for taking extra earnings as a measure of benefit to society is the belief that higher paid persons are more productive than lower paid persons. This measure is less relevant to an enterprise. For an enterprise the concern is with the increase in value of output attributable to training, with the time horizon limited by the likelihood of workers leaving the enterprise.

To date such data have not been used to any great degree in planning by VET authorities. Queensland’s Vocational Education, Training and Employment Commission has indicated that it uses cost-benefit analysis in its consideration of capital works proposals. It states that:

The basic assumption of the methodology is that the difference in net earnings between graduates and non-graduates of a particular course reflects the true value of those graduates to the economy. In other words relative earnings reflect relative productivity of workers (Planning for Tomorrow, 1994, p 25)

While I advocate the collection and analysis of such data it is important to remind ourselves of a number of issues and limitations in such an approach to the measurement of benefits. I will not discuss these issues and limitations at any length here, but a brief outline of some of the major considerations is set out below. Most of the comments relate to the individual and the society, but there are some aspects also relevant to enterprises.
**Current Data, Future Earnings and Jobs**

Even for educational qualifications for which ABS data are available there is the issue of whether current data on earnings by age are a good guide to future earnings in a rapidly changing economy exposed to international competition. In any case they are rarely readily available in sufficient detail for planners. The ABS collects data on income by qualification, but so far there is little information on earnings specifically related to industry training. The 1993 Survey of Training and Education sought information on pay and a wide range of data relating to qualifications, education and training in the last 12 months. ABS survey data on income by qualification is collected every few years and has been used in rate of return studies, but usually these estimates apply only to broad levels such as degree or trade level qualifications. There are other potential sources of data and Bruce Chapman at the ANTA Research Advisory Council seminar in April drew particular attention to the Australian Longitudinal Study.

For planning it is necessary to make forecasts of the demand and supply of skilled labour. It is clear that all VET authorities try to monitor supply and demand. They draw on economic and demographic forecasts and information from Industry Training Advisory Bodies. The problems with these forms of forecasts have been discussed over the years (Psacharopoulos et al 1993). However, they have the virtue of providing some information on the numbers that might be needed, which cost-benefit analysis does not.

The only comprehensive national study of both supply and demand for labour is *Australia's Workforce in the Year 2001* (DEET 1991). The error margin in forecasts such as those of *Workforce 2001* are very considerable due to the sheer unpredictability of many of the key variables such as the rate of separation of workers from the field for which they have trained.

The argument is not that age-earnings-qualifications data should be sought to replace such 'manpower' forecasts. However, it may be valuable to use such earnings data in conjunction with forecasts of supply and demand, unemployment and current starting salaries in preparing advice on the direction of change of education and training.

**Job-Competition and Screening**

One of the objections to the use of earnings associated with education and training as a measure of benefits to society is that the additional earnings may be the result not so much of the content of the education and training but because education and training are used for screening workers for entry to the more productive jobs. One version of this idea as presented by Thurow (1983) is that productivity is inherent in the job — not in the worker. For example it is difficult even for a university graduate to increase the hourly output of a taxi driver. No matter what your skills, the productivity in the job is limited by the technology and the road laws. However, in an architect's office or in a management position in industry it may be possible to undertake innovations that substantially increase the output of the firm. Thurow's theory — in extreme form — is that the crucial thing is to gain entry to the job in which you can be highly productive. The earnings associated with extra education may reflect the access to the more productive job, not the content of the education. However, it is worth noting that Thurow in *Head to Head* (1992) is a strong advocate for expanded training in the US.

From the viewpoint of the individual's investment it does not matter whether the extra earnings are due to the content of education or to its use in screening. What matters are the extra earnings, not the reason for the extra earnings. For the enterprise and society it may
matter. Screening, so that the most appropriate persons are appointed to jobs, is of value, but enterprises and society also expect education and training to improve skills, knowledge and attitudes.

Social Background and Ability

Leaving aside the problems of screening, there are a range of other reasons why additional earnings may not indicate benefits to society. Persons with the most education and training often come from high socio-economic backgrounds, have high measured ability or school achievement levels. Studies in the USA have attempted to isolate the separate effect of education by using multiple regression analysis. These studies suggest that about 80 per cent of the extra earnings associated with extra education can be attributed to it and 20 per cent to other factors like family background and ability.

Competitive Labour Markets?

Another reason for worry about the usefulness of extra earnings as a measure of benefits to society is that about a quarter of all employment is in the public sector and in that sector there is no monetary measure of productivity and not always an incentive to employ the cheapest worker for a particular job. It is indeed difficult to measure productivity in services in the private sector, but, for a firm as a whole, relatively low productivity will tend to show up in low profits.

There are other obvious signs that the market for labour may not operate according to the rules of a competitive product market. One employer may dominate a labour market or trade unions and the industrial system may affect employment and wage rates. Even in the absence of unions, there may be customary procedures in internal labour markets, particularly procedures concerning increments for seniority which may affect earnings. There could be good economic reasons for this. Morale and motivation in the workplace is important and some wage structures may help promote this, even though they do not equate wages with individual productivity. In particular, a structure that encourages older workers to train younger ones seems desirable. If the older workers are not secure in pay and status they may be reluctant to pass on their skills. This may be of little consequence in the checkout lines at a supermarket, but it may be important in more skilled occupations. Thurow argues that, in fact, pay is likely to be linked to the productivity of a group of workers, but not necessarily to that of individual members of the group.

Externalities

There are some major productivity benefits to society that are not reflected in additional earnings. These are what economists call externalities and an example would be the effect of well trained managers on the productivity of their staff. A lift in the general level of training of the workforce may encourage investment in new technology and result in productivity growth beyond that directly due to the training of the worker trained (see Fitzgerald 1994).

Equity

Monetary measures of benefits may not be sufficient if our concern is the literacy levels of disadvantaged groups. We may be interested in ensuring improvements in literacy even if the pay-off in terms of extra productivity is small. We may be concerned to improve their everyday participation in society and their chances of employment, even if this 'does not improve the overall level of employment and production in society. Similarly it would not be necessary to prove the economic benefits of the Finn targets of a high level of participation.
by young people in education and training to justify the costs involved.

**Summing Up**

Age-earnings-qualifications data on the earnings associated with education and training have not, in fact, been used to any great extent in educational planning. There are good reasons for caution in interpreting such data as indicating benefits to society. But taken in conjunction with other economic data on the supply and demand for labour they may prove useful.

4. **Costing**

Even where it is difficult to estimate monetary benefits it is still appropriate to ask what are the monetary costs involved in any activity, along with non-monetary costs and benefits. The term 'cost-effectiveness' can be used to cover such an approach, which could include standard forms of evaluation of education and training, along with a standard form of measurement of costs. The most obvious problem with this approach is that a number of different benefits may be measured, but there is no clear way to add them together to compare them with the costs. In the health evaluation field a common measure of utility has been developed, known as a QALY, which is a measure of the effect of a health care intervention on the quality and length of life. There is no similar measure for education and training, though a range of indicators are being developed. The estimation of QALYs has been a matter of heated debate, but Drummond (1992) considers it is still the most powerful approach to economic evaluation yet developed by practitioners of cost-benefit analysis in the health field.

The costing side of the analysis is not as straightforward as it might seem. As mentioned, aggregate estimates of expenditure, at best, provide an indication of the dimensions of education and training. It is rare that aggregate data collected from surveys or government budgets will provide information on the direct costs attributable to a particular level or type of education and training. Vocational education and training authorities are moving to develop models that identify more clearly the costs of particular programs. A vocational education and training should eventually provide data that will be useful in the estimation of the costs of vocational education and training. But even for TAFE this is some time off.

In the short term, and even in the long term, there is no substitute for actually costing the resources attributable to a particular program. The suggested approach is what Levin (1983) calls the 'ingredients approach'. This approach involves identifying all the ingredients involved in a program such as personnel, buildings, material, equipment, power, water, etc. It then requires the estimation of costs, with the greatest effort expended in costing the largest items. The costing needs to be undertaken with consideration of who bears the costs: employers, governments or individuals.

This approach allows us to move beyond the black-box of cost-benefit analysis which, as stated at the start of the paper, tends to be most useful in summative evaluations and usually does not offer much insight into the processes involved. The ingredients approach not only provides costing data in monetary terms. The method involves collecting information on the sort of resources used, such as teachers' time, space use and equipment use. It therefore provides data which can also be used in considering why particular programs are successful. It can be linked with other forms of evaluation (e.g. case studies) to lead to recommendations for program change.
Data on the total costs of education and training are useful in identifying the broad dimensions of vocational education and training. However, it is important not to focus only on what has been measured and neglect other important areas such as non-formal training.

Data on costs of education and training can be compared with the apparent benefits. In economic evaluations, the major indicator of benefit is the addition to earnings associated with the education or training. It is timely to review the problems of both data and concept with this approach, without denying the usefulness of such data when used in conjunction with other information on the demand and supply of labour.

Since aggregate data on expenditure rarely yields information on costs of particular education and training programs, it is necessary to supplement the aggregate data with direct costing of specific programs. The approach suggested here is the 'ingredients approach', which not only provides a straightforward method for costing, but also yields details on the actual resources used in a program. It provides data that can also be used in understanding the processes by which a program achieves its results.

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1. Introduction

As part of a student project at university some 25 years ago, I undertook a review of the then available cost-benefit studies in education. My motive was largely to discover what rates of return might attend the furtherance of my own educational studies and in which direction I should go, career-wise. Like the generations that had gone before me, and those that have followed since, I learned that one might expect a 20% return on the investment; that it was virtually impossible to discriminate between professional career paths, and that, apart from the trades, there existed no information on returns to investment in vocational education and training (VET), or technical education, as it was referred to in those days. Methodologically, the approaches used were based primarily upon comparing the expected future incomes of people with and without a higher, or a trade-based, education and expressing these as a return on the investment made. Debate was centred on the measurement and attribution of the private and the public benefits conferred by education and the need for more sophisticated analysis.

A few years later, I was involved in some studies of rural adjustment and was intrigued to find that many farmers accepted substantially lower financial incomes than their urban counterparts, yet clung to the land tenaciously. In some cases, their financial income was virtually zero. Further investigation yielded evidence of a substantial 'psychic' income — based largely upon the feeling of well-being that derives from being your own boss, having a freer lifestyle than those people living in cities and towns, enjoying the open air work-style, etc. Yet, this income most certainly had not appeared in any of the formal cost-benefit educational studies I examined, nor for that matter, is it in those I have seen since.

A decade or so later, I again entered the field of the economics of education with the task of trying to establish whether there was an optimal economic size for TAFE colleges. While economics had indicated a theoretical perspective on the matter, and statistics provided suitable analytical techniques, no such studies had been conducted in Australia, though there were then over 300 colleges in existence, ranging over many sizes with some 800,000 enrolments annually across more than 1,000 courses.

By the late 1980's, governments had become more conscious of the cost of borrowing capital and of the need for greater consideration of the options for the creation or procurement of new capital facilities. We thus developed cost-effectiveness study techniques that allowed us to compare options for capital projects. However, because economic techniques had proved inadequate, we found it was impossible to utilise cost-benefit techniques. The problem of measuring future returns and/or incomes had not progressed much beyond its state of some two decades before.

The views expressed in this paper are those of the author and not necessarily those of the NSW Board of Vocational Education and Training.
Currently, this problem is growing even more complex. With the policy to stimulate private training activity through tendering out funds for programs, the need to appraise an ever widening range of capital-based projects, the drive to be more cost-efficient in developing and delivering curricula, the ongoing challenge to allocate resources efficiently on a local, state-wide and national basis, and the fundamental challenge to place the 'VET dollar' where the returns are highest — both from an equity and an industry perspective — comes a new and greater challenge to economists of education. This challenge is exemplified in some of the questions facing current educational planners in the VET sector:

- Are the returns on literacy and numeracy courses greater or less than mainstream courses?
- What is the value of the community service obligations that governments impose upon public VET providers?
- Is workplace training more or less cost-effective than formal attendance at colleges?
- When is it more cost-efficient to use distance learning modes and when is it not?
- What adjustments are necessary in the costs of private and public providers of vocational education and training to ensure a 'level playing field' in the competition for funds?
- Of the myriad of entry-level VET programs available (including those offered by schools) which are the most cost-effective?
- At what level of return on investment should we acknowledge that equity programs do not justify their cost? (I ask this because recently it was quoted to me in personal correspondence that the cost for one mentally handicapped student on an annual basis in a full-time VET program was $90,000. Based on a cost of $5,000 per head per year for full-time Associate Diploma students, around 18 could have attended for the same outlay)
- What impact does vocational education and training have upon productivity?
- Finally, are devolved structures more or less efficient than centralised ones?

Admittedly, these are complex problems, but we have had at least 25 years to address them. How have we fared in addressing them so far?

2. The Economists' Response

Any perusal of the recent literature will soon convince one that what is available is of very limited use to VET planners and administrators. In particular, consider the conclusions by Maglen (1992)

At the micro-level there is some evidence that education improves productivity at the most basic levels, in the simplest tasks ... not a lot of this can be easily generalised to high-level occupations in the manufacturing and service industries in developed countries such as Australia; and

macro-evidence in the form of the performance of the Australian economy over the period of sustained economic expansion ... is particularly disappointing ... nor is there any clear evidence that the countries that have had the most success in instigating and
adopting technological innovations are the ones that have devoted more resources to education overall; and

indirect evidence — via the link between extra education and higher earnings — has been the crutch upon which much of the research and most of the policy advice rendered by economists over the years has relied. Unfortunately, it has proved to be a very weak one; the link between education and earnings can tell us little about the productivity enhancing capacity of extra education.

The conclusions of Maglen are echoed by McDonald (1994):

The last few years have seen the development of expertise in standards development, curriculum, staff development and, to a lesser extent, assessment; but we have not developed expertise in costing.

McDonald goes on to detail a number of questions which, he feels, are not worth trying to answer. This is largely because economists have been addressing them for decades and have succeeded only in generating the meagre outcomes that Maglen outlines above. Some of McDonald’s arguments rest upon the inadequacies of measures and measurement tools, others on the methodological issues involved in defining ‘returns’, and yet others on the theoretical differences that arise between the ‘human capital’ model and the ‘educational screening’ model.

The message from both of these writers is clearly that current methodologies do not appear to be taking us very far. They conclude by indicating the need to switch the focus of future investigation. Before looking at what some of those future directions might be, however, it is worth considering the current levels of activity in the Australian VET sector to give us some idea of the size of the investment concerned.

3. Investment in Vocational Education and Training

Australian figures for annual expenditure on vocational education and training across both the public and private sectors have been estimated at approximately $5 billion, taking into account the cost of time lost or replacement staff that firms incur when workers undertake training. In the public sector, the replacement cost of capital infrastructure is some $64 billion and the intellectual value of the thousands of training programs on offer, including learning resource materials, is conservatively estimated to exceed $1 billion. Add to this the value of the investment in trained teaching and support staff — a further $1 billion — and a ‘ball park’ figure for the system amounts to $8.9 billion. Figures are not available for the private sector, but acknowledging that its investment is considerably less than the public sector, an estimate approaching $12 billion would not be unrealistic for the total level of investment in VET in Australia.

What does this mean? Essentially, Australia currently invests around $12 billion a year in resources for vocational education and training (this excludes the university sector and schools) and expends some $5 billion annually on VET activities. Yet, economists cannot deliver any worthwhile evidence that such an investment generates a positive outcome for the nation. Are the one million or so students who enrol in publicly-funded VET programs every year being misled? Is the Australian taxpayer, who has consistently supported increasing expenditures on education, being duped? Are all those teachers and instructors — people who can see and measure the increment in students’ skills and knowledge over the passage of a course — engaged in an exercise of collective self-deception? Or is it time that those persons practising in the field of the economics of education got down to seriously asking themselves where they are going wrong?
4. Where To Next?

If economists are to change direction, what should the new direction be? Bearing in mind that we do not wish to 'throw the baby out with the bath water', there seem to be a number of avenues that could very well yield more useful information than is currently the case.

First, there can be little doubt that a focus on the micro rather than the macro could prove useful. As an example, economists persist with using tradespersons' salaries as a basis for estimating returns on investment in VET. Evidence available for at least the last 12-15 years has indicated that, five years after they have completed their trade courses, around 50% have left the trade for which they studied. The number drops further the longer the period from graduation. So what happens to them? Anecdotal evidence is that they become self-employed, move into sales, supervision and/or management positions, and most importantly, leave 'blue collar' work behind. Logic suggests that they also improve their incomes and gain 'psychic' income from their new social status. Investigations based on case studies of career paths and occupational mobility, then, would perhaps be one direction for economic investigation.

Second, and again focusing on the micro approach, some useful studies of individuals and their organisations in relation to training and output would seem to be called for. Training is increasingly becoming a 'bargaining chip' in industrial agreements and there abounds a large quantum of, again, anecdotal evidence that links training and productivity in a positive manner. A more systematic and enterprise-based approach would certainly be welcome in this field.

Third, economists could concentrate on firms and inter-firm comparisons rather than rely persistently on the return to the individual. It is useful to reflect that most of Australia's top performing companies, such as Lend Lease, McDonald's and BHP, have a very strong commitment to training. Indeed, BHP has self-accrediting status for its VET programs in NSW. Is this because training gives these companies a competitive edge?

Fourth, economists must strike on a number of technical fronts. Measurement techniques are still neither sophisticated nor accurate enough to allow us to compare the costs and benefits of different types of VET programs. Until we start applying measures to, say, literacy versus trade, versus traineeship, versus Associate Diploma, versus general education programs, we will never develop the refined analytical tools needed to make efficient resource allocation decisions. On the cost side of things, unless we significantly improve our costing systems, we will never be able to accurately relate costs to benefits. The new financial framework that is currently under development in the Australian VET sector should assist considerably in this latter endeavour.

Finally, we must recognise that new developments take place within an ideological framework — the human capital theory versus the educational screening model is but one example — and that no matter how rational the economic argument might be, decisions will rarely be made on economic grounds alone. Equity programs, labour market programs, access arguments, and the debate about generic skill development versus instruction for enterprise-specific practices and equipment, are all examples of areas where ideological and non-economic values have worked to modify the approach that might be taken on economic grounds alone. In some situations, of course, ideological positions have all but eliminated the economic one. A challenge for economists is to temper purely economic approaches with qualitative data so that the final picture is one which blends a variety of non-economic perspectives with robust economic analysis.
5. Conclusion

Developments in the economics of vocational education and training over the last 25 years have most certainly not provided a set of useful analytical tools for the modern VET administrator. What has happened largely is a continuation of the application of methodologies and measures that were as problematic 25 years ago as they are today. With the growing complexity of modern systems of vocational education and training comes a new range of challenges which are requiring us to do more with less, make more rational use of our existing resources, and critically analyse the cost-efficiency and effectiveness of our strategies. If economists are going to play a part in the future of vocational education and training in Australia, they need to rid themselves of the encumbrances of the past, and turn their attention to new approaches rather than replicating the old.

Two things are certain. First, the current government climate has never been more amenable to economic analysis. Second, in the field of vocational education and training, economists have not been up to the task of performing that analysis. The challenge for economists practising in the field of the economics of education, then, is to take up the gauntlet and make a more useful contribution to the nation’s educational future than they have done in the past. Let us hope that we do not have to wait another 25 years for some developments!

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Two Steps Forward and One Step Back?
Equity and Vocational Education and Training Reform

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Introduction

A process of reform of vocational education and training (VET) in Australia has now been underway for several years. From the very beginning, increasing equity has consistently been expressed as an important objective of this process. This paper aims to answer three linked questions: what is the basis for this commitment to equity, how strong is it, and to what extent is it evident in practice? Section one briefly examines some aspects of the basis for government support for greater equity in VET, stressing the linking of equity with economic efficiency through the connections between education and the labour market. Section two reviews research which highlights how equity has fared as VET reforms have been implemented. Section three attempts to draw some conclusions and offer some answers to the questions posed.

1 Equity, Efficiency and Economic Success

'Equity' and 'efficiency' have sometimes been characterised as opposing, or mutually exclusive, forces. In this view, the goals of one, minimising the internal costs of producing a particular output, are at odds with the goals of the other, achieving fairness.

In recent years, however, new ways of thinking about equity and the way it interacts with efficiency have become evident. Equity has been transformed into both a means necessary for the achievement of economic success and a justification for the quest for economic success itself.

In discussions of contemporary world economic conditions two phenomena dominate: globalisation of industry and of markets; and accelerating technological change (see for instance, Maglen 1994; Burke et al 1994). Economic success is seen as dependent on the attainment of efficiency and economic competitiveness. Equity enters into these discussions at two points. First, development and utilisation of human resources are cast as keys to economic competitiveness, but it is recognised that human potential can only be realised if the problems of the disadvantaged are addressed. Second, economic success is seen as necessary to create the conditions in which a fairer and more equitable society can flourish.

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1 Or "If you write about something a lot you don't actually have to do anything about it". This comment comes from Sir Humphrey Appelby, expressing horror at his new Minister's plan to implement a policy of 'open government', in the very first episode of the television show 'Yes Minister'.

2 Equity takes a different form in non-mainstream economic literature. For instance, Nelson (1993) suggests that criticism of the redefining of economics as 'rational choice theory' has entailed a search for a more inclusive definition of economics that encompasses the study of human welfare and the material and non-material services necessary to achieve it.
Such views of the links between equity and economic success are evident in a recent OECD report, *Women and Structural Change, New Perspectives* (1994), which seeks to challenge 'the traditional assumption that equity and efficiency are mutually exclusive outcomes that have to be traded off against each other'. The report argues that the smooth functioning of OECD societies and their supporting economies depend on recognising women's economic role and enabling their potential to be tapped, describing women as a key resource that is currently underutilised, both quantitatively and qualitatively. Equity and efficiency are linked as 'twin goals'.

The application of these views to policy formulation in education and training in Australia has led to the adoption of an approach aptly described by Henry and Taylor (1994) as a mix of utilitarian and utopian assumptions, combining an explicitly instrumental human capital approach to education and labour market reform, with wider concerns. As part of a broader government plan to achieve economic success, reform of VET is thus described as having both economic and equity objectives, separately and linked.

The federal government's position is evident in policy documents such as *Working Nation* (1994), the white paper on employment and growth.

> If we are to develop the strength to compete in the world and maintain and increase our standard of living we must make the most of all our resources. Greatest of all these are the talents and energies of the Australian people. When we waste them we are weakened. When we employ them, we are made stronger (p.1).

According to this policy paper Australia is a nation defined by fairness and equity in social life, made possible through economic strength and cohesion. The government's goal is the development of a sophisticated and efficient economy underpinning an equitable and cohesive society.

In 1992, Prime Minister Keating clearly linked equity and economic efficiency in describing the aims of VET reform as the provision of an educated, skilled and flexible workforce to enable Australian industry to be competitive in domestic and international markets, and the improvement of the knowledge, skills and quality of life for Australians, having regard to the particular needs of disadvantaged groups.

A statement of the national goals for vocational education and training, prepared by Commonwealth, State and Territory Ministers (VEETAC 1992), contains similar views. It describes a system of education and training that would provide the skilled and capable workforce necessary to increase Australia's competitive edge in the world marketplace and includes one specific equity goal to improve access to and outcomes from vocational education and training for disadvantaged groups.

A more recent statement about VET by the Prime Minister (Keating 1995), also links equity and efficiency, but with a slightly different emphasis. Keating declares vocational education and training to be about two national issues — equity and efficiency, but in this case, declares equity to be the primary issue. He goes further, casting VET as an equity measure in itself through its role in increasing opportunities for employment, and for a higher lifetime income.

> Expanding vocational education to the degree that we are expanding it, is very likely to assist those among our young people who are relatively disadvantaged. And it is certainly the case that once individuals acquire post-school qualifications, their lifetime incomes and opportunities are significantly increased .....

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However he remains conscious of the contribution this will make to national economic success

In the case of vocational education and training, we have to recognise — as a nation — that we are not just increasing the life chances of the disadvantaged, but guaranteeing our economic competitiveness (Keating 1995, p 11)

The relationship between VET and improved opportunities for the disadvantaged and for a higher lifetime income, to which Keating refers, centres on demonstrated links between the level of education and the incidence of unemployment, with unemployment declining as the level of education increases. Assumed in his statement is that employment opportunities will be available for those who successfully participate in vocational education and training.

The links Keating observes between education, training, employment and economic success are the basis for much of DEET's 1993 Draft Equity Strategy, which listed key features for enhancing access to vocational education and training for all young people, and stressed the need to take equity issues into account in the development and implementation of the AVC training system (Henry and Taylor 1994) They are also applied by the Australian National Training Authority (ANTA) in its Access and Equity Planning Model (1995) to support greater attention to the needs of the disadvantaged in VET. The model re-iterates the needs of industry for a skilled labour force, and the role of the VET system in meeting these needs, but it also draws attention to the needs of individuals for skills that will enable them to follow career choices and improve their opportunities for employment (p.2)

The planning model identifies that.

- post-school qualifications enhance an individual's prospects of gaining employment, but some target (disadvantaged) groups have significantly lower rates of post-school qualifications,

- labour force data show that unemployment rates are higher for people from target (disadvantaged) groups, and

- participation in workplace training and in TAFE is lower among some target (disadvantaged) groups.

ANTA requires all stakeholders in the national VET system to 'address the access and equity needs of individuals from target groups, just as they are required to address the needs of industries and enterprises' (p 4).

Implicit in ANTA's model are at least three assumptions: that improving access to vocational education and training for disadvantaged groups will enable them to gain post-school qualifications, that gaining skills will increase the likelihood of success in the labour market, and that this will contribute to the skill pool that industry needs to be economically successful.

2. Equity in Practice

In the extensive range of documents dealing with the conception, planning and implementation of the new national VET system, several groups have been recognised as disadvantaged — particularly those seeking access to training in non-traditional fields, people from non-English speaking backgrounds, Aboriginal and Torres Strait Islander peoples; people with disabilities, people in rural and remote areas, the unemployed — particularly the long-term unemployed, people with low levels of English language literacy and numeracy; homeless youth, and low income groups.

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Recognition of disadvantage focuses on the low levels, or the restricted nature, of the participation of these groups in vocational education and training. Several studies of some of the factors that affect participation, and their implications, have already been undertaken and others are continuing (see for instance, Mageean (1990) on migrant women in rural areas, Pocock (1988) on women in the TAFE system, Barnett (1994) on the impact of fees in TAFE). These studies demonstrate that increasing the participation of the disadvantaged in VET has implications for access, curricula and course delivery.

The task of countering disadvantage is made more difficult, particularly if it is to be done in a way that will promote labour market success, by the reality that many disadvantaged people fit into more than one category of disadvantage. That is, labels that neatly classify the disadvantaged into particular groups, such as ‘women’, ‘migrants’ and ‘the long-term unemployed’, disguise a more complex picture. Given this, strategies which attempt to deal with only one aspect of disadvantage are not likely to be a complete success.

Prior to the initiation of the present reform process, both the TAFE sector and the Adult and Community Education (ACE) sectors already had better records than higher education in catering for special needs. So far, the present process of VET reform has included the development of several new initiatives which have equity implications. In particular, recognition of prior learning (RPL) and competency-based learning and assessment (CBA) offer opportunities for those without formal qualifications or who have not attended formal training courses, to have their skills recognised and accredited. Moreover, expansion of VET itself has equity implications, by increasing the number of opportunities for participation, provided that other barriers to participation are simultaneously reduced.

ANTA’s Access and Equity Planning Model outlines operating strategies for the VET system that are designed to improve its performance in dealing with disadvantaged groups. These include:

- identifying priorities for each group and the types and levels of training required,
- implementing support services,
- allocating public funds for programs that demonstrate an ability to meet the needs of the disadvantaged,
- marketing programs in accessible formats and languages;
- consulting with representatives of disadvantaged groups; and

For instance, the education and training needs of migrant women with limited English living in remote rural areas may be quite different from those of urbanised migrant women, although as women, and migrants, both may suffer some similar difficulties.

Barnett (1993) describes two types of barriers to women’s participation in TAFE: structural; and attitudinal. Structural barriers include things such as income support, child care, timetabling, fees and charges, location of courses and lack of information. Attitudinal barriers would include perceptions of the value of women’s skills. Because of the difficulties of changing attitudes, most equity initiatives deal with structural barriers.
recognising and responding to cultural diversity.

However, no matter how good such strategies are in increasing the participation of the disadvantaged in VET, their ability to contribute to labour market success and ultimately to national economic success, as envisioned by Prime Minister Keating, is limited by other factors that affect workforce participation and the ability to make life choices.

Labour market disadvantage is experienced not only by those unable to gain employment, but also by those who cannot obtain appropriate or adequate work. Thus it encompasses both those who are unemployed for longer than average periods and workers such as those in part-time jobs who would prefer to work full-time, those in 'dead-end' jobs with no career path and those unable to gain jobs which fit their level of skill. Three main sets of causes are involved: a lack of job skills, especially the particular job skills required in the newly re-structured, technology-based workplaces, the non-recognition of skills, such as those gained informally, overseas or in non-institutional settings, and a diversity of social, political and economic factors that inhibit workforce participation and life choices, including the structure of the workforce itself.

Workers with family responsibilities, for instance, may find that the jobs available are incompatible with these responsibilities, new migrants may have job skills but lack the cultural literacy that enables them to gain information about employment opportunities, women may not be able to gain jobs that are considered to be 'men's jobs' even when they have the skills to do these jobs; and inadequate public transport may prevent workers from taking up employment opportunities in another district.

The Australian labour market has been defined as comprising two parts. A 'primary' labour market which is "central to the firm's operations, and is a high wage and high status labour market offering job security, access to an internal career structure, and training" (Schofield 1989, p 23), and a 'secondary' labour market which is "a low wage, high turnover labour market, offering insecure part-time or casual employment and little scope for advancement" (Schofield 1990, p.23) Many people from disadvantaged groups are still found in the 'secondary', 'poor-relation' labour market.

Because many factors contribute to labour market disadvantage, reform of vocational education and training, by itself, is an inadequate remedy. A broader strategy incorporating a range of social, economic and political reforms that address the full diversity of problems is necessary. For instance, the OECD supports an integrated policy strategy. "the solution lies in applying an integrated approach to institutional change aimed at addressing the contradictions and tensions generated at the interface between the household, the community and employment structures" (OECD 1994, p.18).

Nevertheless, initiatives which aim to increase participation by the disadvantaged in VET remain an important element in the implementation of a broad strategy. Thus it is disappointing that some early research on aspects of VET reform suggests that the commitment to the achievement of equity is rhetorical rather than substantial; that equity initiatives have had only low levels of success, and that it is possible that equity may be adversely affected by some of the reforms.

For instance, an initial analysis by the ACER5 of results from the 1993 ABS Survey of Education and Training indicates that while the incidence of training and levels of participation in training

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5 This work is being undertaken by Phillip McKenzie and Mike Long, who presented their initial results at a seminar conducted for the Centre for the Economics of Education and Training in May 1995
have risen since 1989, inequities persist:

- workers born in non-English speaking countries still have substantially lower rates of participation in all forms of training than workers born in Australia,
- workers with post-school qualifications participate in training to a greater extent than those without post-school qualifications;
- participation in training increases with the size of the workplace,
- public sector workers participate in training more than those in the private sector, and
- part-time and casual workers participate in fewer training courses and spend on average fewer hours in training than other workers.

Looking only at full-time workers in the private sector, who had been employed with their main employer for 12 months or more, they found:

- lower levels of participation in training in lower status occupations such as labourer, operator, or tradesperson,
- workers born in non-English speaking countries have lower rates of participation in training, and participate in fewer courses, although those who do participate spend more hours in training than Australian-born workers; and
- women workers spend fewer hours in training than men, although their training participation rates are similar.

Wallace's analysis of training statistics (Wallace 1995) also demonstrates that, while some success appears to have been achieved in improving participation in training by women, inequities persist. At a superficial level the statistics indicate that women now enjoy about the same, or slightly better, access to training than do men. However, a deeper analysis reveals that women are more likely to be in shorter courses that are unstructured, unaccredited and do not provide pathways to further courses. In addition, women workers who are employed part-time, or who are from a non-English speaking background, receive low levels of training.

Henry and Taylor (1994) draw attention to the marginalisation of equity within the whole organisational process of the AVC pilot scheme. They note that the AVC Pilots National Evaluation Strategy (March 1993) referred to the need to identify the extent to which groups not typically involved in entry-level training in the past are now participating, ie whether equity targets have been achieved. However, the processes of marginalisation and the emergence of potential loop-holes were evident from the outset. For example, the Explanatory Notes were distributed as Addenda to the Pilot Project Guidelines about five months after the initial guidelines were issued in 1992 and they include the significant point that ‘access and equity criteria should not be applied absolutely to individual projects’, but were to be applied across the suite of projects within each state ‘in order to identify gaps and best practice’ (1994, p.30).

Their study (1994) of some Australian Vocational Certificate pilot schemes implemented in Queensland suggests the existence of a gap between expressions of support for equity, and what happened in practice. They describe the pre-reform VET system as male-dominated, having a front-end approach, that preserved the privileged labour market position of credential holders.
However, they assert that only one of the pilot schemes they examined challenged fundamental education arrangements, claiming that the others were 'narrowly conceived and pragmatic in approach', or merely old 'dead-end' approaches, dressed up in new language (primarily in order to obtain funding). While the brief for one scheme specifically acknowledged the need to include disadvantaged students, they believed that no such students were actually involved. Another, concerned with students who were not academically inclined, was selective in its intake and 'more explicit notions of equity were absent except at the most cursory level' (1994, p 31).

Among the major policy issues that they see arising from their study are the question of finding a way to prevent 'the new agenda from becoming another channelling device whose benefits are co-opted by the already advantaged', and the lack of attention paid to the monitoring of equity.

Connole and Butler are currently researching 'the ways in which gender equity is being incorporated in policy frameworks, consultation and decision-making processes in the National Vocational Education and Training System'. The focus of the research includes 'acknowledgment of women's skills, factors affecting women's access to and participation in training, and equitable provision for industries and occupations in which women predominate'.

In a recent paper arising from this research work, Lawrence, Butler and Simons (1995) report on the results of consultations with focus groups of women working in traditionally female occupations. The authors note that most of these women recognise the potential of reforms to improve their position, but are very sceptical about whether this will eventuate. They report significant variations in access to training according to employment sector and status. Higher level workers had received much more training, lower level workers (many of them from non-English speaking backgrounds) had received less training and it was more likely to be informal and unstructured. For instance,

Between 85% and 100% of clerical and administrative staff and women working as vocational educators and managers had participated in staff development or training programs. In contrast, none of the hospital cleaners (who were of predominantly non-English speaking background) had received specific training on the requirements and standards for their work in spite of stringent standards of hospital sanitation, ward procedures, and occupational health and safety which they were expected to be aware of and adhere to (Lawrence, Butler and Simons 1995, p 10).

The authors cite examples showing how women's skills continue to be undervalued and how employers use weak excuses to deny women access to training. They also report that their findings highlight previous research indicating that the competency-based approach to skills and training might be imposing new pressures and potentially discriminatory practices on NESB women, by an over-emphasis on English-language skills.

A major conclusion of their work is that women cannot be treated as a generic group with a single and distinct set of needs and interests for their vocational education and training needs are affected by many factors, including their occupation, the location, structure and politics of their workplace, enterprise and industry, their English language skills, their vulnerability to discriminatory practices, and the value accorded to 'women's work' (1995, p 13).

In other papers arising from this work Connole and Butler (1994; 1995) describe some positive aspects for gender equity of the training reform agenda, but also some disquieting negative...

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6 These quotes are from a letter to the author from Kate Lawrence, Research Officer to the Project, in which she outlines its main objectives and features.
features. Their work is based on policy analysis, skills analyses, competency standards development, analyses of training needs, and interviews and focus group discussions with women workers from a wide range of industries.

Among the positive aspects of the reforms they report that:

- the process has opened up issues on training, creating a climate in which workers may expect training, career paths and involvement in best practice/continuous improvement in what were previously static industries and workplaces. Women workers have been included;
- traditional gendered notions of skilled workers developed in trades through apprenticeship arrangements have been challenged. Traineeships have increased women’s involvement in entry level training and given credit for competencies in some industries and occupations which were previously defined as unskilled;
- the mapping of skills and competencies in the workforce has allowed previously unexamined areas of women’s work to have their skills named and organised into levels, creating career paths, a basis for training and a framework for industrial bargaining. It has also helped identify structured gender disparities in the workforce and barriers to equity;
- attention has been focused on the unsatisfactory nature of training in many feminised industries;
- RPL has provided an opportunity to name and claim skills and competency status in the workplace and in training schemes through recognising and valuing of experiential learning; and
- funding has been granted for gender equity initiatives, particularly through the national plan of action for women in TAFE.

However, these are offset to some degree by negative features:

- the competency framework functions as a ‘relation of surveillance with workers defined as their competencies’ (1994, p.9);
- most emphasis and funding is being directed to entry level (ASF levels 1-3) training, decreasing emphasis on the development of competencies for middle levels (ASF 4-6) or paraprofessional workers, which should cover the work of a large number of women in feminised occupations and industries;
- the emphasis on defining skills for entry level work is establishing a new barrier for women wishing to enter or re-enter the workforce;
- the skills of women workers in feminised service industries and occupations are not being recognised, so that previous discrimination is becoming entrenched;
- monitoring for gender bias within the development of competency standards has not been subject to public report; and
- so far no research has been conducted analysing the relevance and effects of competency based training on women as workers or learners.
A theme recurring throughout much of the recent literature examining equity in VET is that progress achieved thus far is potentially endangered by developments that have not taken equity into consideration. Connole and Butler (1995) make this point in suggesting that progress could be damaged by the emphasis on the provision of VET by industry and private providers who have not demonstrated any interest or expertise in equity, or women's training.

Barnett’s (1993) study of the implications of the open training market for women’s participation in TAFE expresses concerns that in the drive to achieve efficiency in the training market equity considerations may be sacrificed, because they can be regarded as incurring additional resource input.

One of the central concerns to be addressed in a move towards an open training market is the need to maintain access and equity as a linchpin rather than an unnecessary cost (Barnett 1993, p. v).

Barnett questions whether the development of an open training market will entrench inequality or enhance equity.

...the barriers characterising our vocational education system must be addressed if an open training market evolves, in order to prevent women’s position in vocational education from deteriorating further. Given the problems faced in the currently publicly funded and controlled environment, it will be even more difficult to achieve this in a diversified, open training environment (Barnett 1993, p. v).

The misgivings she expresses appear to be confirmed by the way in which equity is conceived in a detailed recent report by the Allen Consulting Group (Allen 1995) that discusses the dimensions, form and objectives of the emerging ‘national training market’. Contrary to the conception of equity as an integral part of the reform process and essentially linked to the achievement of economic success (as expressed in policy documents), this report on the whole characterises equity as an ‘add-on’ that is a matter only for government consideration and support. In so doing, it consigns equity to the margins of the VET reform process. The report pays scant attention to the equity implications of each aspect of the training market that it considers.

3. Conclusions

In most of the documents relating to the creation, planning and implementation of VET reform a strong commitment is expressed to the need to achieve greater equity. The basis for this commitment is both utopian and utilitarian. Equity is conceived as an integral element in a strategy to achieve economic success through the development of human resources — to be achieved in part through enhanced education and training. Economic success is in turn seen as essential to the creation of a fairer and more equitable society.

Early research on the progress of equity in the VET reform process indicates however that there is a gap between the expressed commitment to equity, and what is happening in practice. Moreover, a fear is being expressed that some elements of the reform process may work against further progress being made, or may even wipe out existing gains.

This is disturbing. By itself, reform of vocational education and training cannot remedy disadvantage which has multiple causes, such as labour market disadvantage caused by discrimination, social and cultural biases and the structure of the workforce itself. However, if equity considerations are integral to this reform process it can become an important element in a broader remedial strategy. If, on the other hand, equity initiatives are merely added to an
equity-hostile, or even equity-neutral VET reform process, the risk of perpetuating, replicating or creating disadvantage is increased. Ultimately, this would lead to the failure of the utilitarian or utopian visions that now drive much of the VET reform process.

However, it is still too early to come to any firm conclusions about whether the commitment to equity in the VET reform process is substantial, or merely rhetorical. Much further evidence needs to be gathered.

References


Barnett, Kate (1993), *Swings and Roundabouts: The Open Training Market and Women’s Participation in TAFE*, a discussion paper, National Centre for Vocational Education Research, Leabrook, S.A.


Keating, Paul (1995), Speech to the ANTA National Conference, Brisbane, February


Mageean, Pauline (1990), *The Vocational and Further Education Needs of Adult Immigrants in Rural Australia*, TAFE National Centre for Research and Development, Adelaide.


The Search for Improved Vocational Education and Training Data

John Foyster
National Centre for Vocational Education Research, Adelaide

1. Background

In a comprehensive recent review Burke et al (1994) have identified strengths and weaknesses in data collected on vocational education and training in Australia in supporting research related to the internal efficiency of VET. In their summary Burke and others suggest, in reference to a new statistical standard for data collection, that "there are prospects of better data through the implementation of AVETMISS" (Burke et al 1994, p 67)

But just how much better might the data be? Better than what? How justified is the optimism? These are all questions which leap to mind. The purpose of this paper is to explore these questions citing examples of data formerly or currently available, and contrasting these with what is likely to become available in the future. At the time of writing AVETMISS, the new statistical standard, is still being implemented, so that no final conclusions can be drawn as yet

2. What Information?

(i) In the good old days

A decade ago any investigation of the costs and efficiencies of vocational education might have started with data from the annual Selected TAFE Statistics (Commonwealth Tertiary Education Commission), which, although it dealt mainly with student activity, also contained broadly useful information on costs. For some areas, the detail is quite specific but in other areas it may be quite inadequate.

To illustrate the situation concretely, let us consider a very general (and hypothetical) example and explore how the published information available might shed light on the question being asked. The example we shall take is an investigator wanting to learn why it appears that TAFE costs in South Australia in 1986 were very high. The following describes what the investigator might learn from the available published data. The salaries of full-time teaching staff in South Australia were relatively high compared with those in the rest of the country. As Table 1 shows, a very large proportion of teaching staff had salaries in the upper range — in South Australia 62.91% of full-time teachers had salaries of $29,000 or more, whereas nationally fewer than half that proportion received salaries of that size (A quirk of reporting disguises the fact that almost all of those SA teachers were receiving salaries of $31,000 or more)

<table>
<thead>
<tr>
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<th>NSW</th>
<th>VIC</th>
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<th>TAS</th>
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<th>AUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to $20,000</td>
<td>3 00%</td>
<td>8 59%</td>
<td>1 49%</td>
<td>8 41%</td>
<td>18 75%</td>
<td>4 83%</td>
<td>3 06%</td>
<td>0 21%</td>
<td>6 36%</td>
</tr>
<tr>
<td>Middle Range</td>
<td>62 97%</td>
<td>77 70%</td>
<td>86 92%</td>
<td>28 68%</td>
<td>47 54%</td>
<td>57 14%</td>
<td>48 03%</td>
<td>26 83%</td>
<td>63 99%</td>
</tr>
<tr>
<td>$29,000 and above</td>
<td>34 03%</td>
<td>13 71%</td>
<td>11 59%</td>
<td>62 91%</td>
<td>33 72%</td>
<td>38 03%</td>
<td>48 91%</td>
<td>72 96%</td>
<td>30 05%</td>
</tr>
</tbody>
</table>

Source: Selected TAFE Statistics 1985, Table 20, p 68
As Table 18 of *Selected TAFE Statistics 1985* shows that the average annual teaching hours of those full-time teachers in South Australia were also higher than the national average (593 hours versus 551 hours nationally) the investigator might adopt the view that higher annual earnings were associated with higher average annual teaching hours. Such a view is logical, but longer hours and higher salaries are not always linked. The same Table shows that full-time teachers in the ACT, who appear to be the highest paid, also taught the fewest average annual hours — 470, far below the national average.

If the investigator wished to pursue the matter further, there might be an investigation of a link between inputs (teaching hours and money) and outputs in the form of student contact hours. First, as a proxy for ‘class size’, it is possible to obtain average figures for each stream of study by dividing student contact hours by teaching hours, as in Table 2 below. Table 2 suggests that average ‘class size’ in South Australia is relatively small. Perhaps this was the reason costs appeared high in South Australia in 1985.

### Table 2: 1985 ASCH Teaching Hours = Class Size

<table>
<thead>
<tr>
<th>Stream</th>
<th>NSW</th>
<th>VIC</th>
<th>QLD</th>
<th>SA</th>
<th>WA</th>
<th>TAS</th>
<th>NT</th>
<th>ACT</th>
<th>AUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional</td>
<td>14.53</td>
<td>11.88</td>
<td>5.63</td>
<td>0.00</td>
<td>9.73</td>
<td>0.00</td>
<td>0.00</td>
<td>12.06</td>
<td>11.93</td>
</tr>
<tr>
<td>Trades</td>
<td>12.19</td>
<td>11.13</td>
<td>13.28</td>
<td>9.28</td>
<td>8.98</td>
<td>7.28</td>
<td>7.54</td>
<td>8.44</td>
<td>11.30</td>
</tr>
<tr>
<td>Other Skilled</td>
<td>21.22</td>
<td>15.34</td>
<td>13.16</td>
<td>11.00</td>
<td>11.27</td>
<td>21.76</td>
<td>9.29</td>
<td>16.43</td>
<td>16.20</td>
</tr>
<tr>
<td>Preparatory</td>
<td>16.67</td>
<td>15.37</td>
<td>12.76</td>
<td>16.61</td>
<td>14.42</td>
<td>13.05</td>
<td>9.18</td>
<td>16.94</td>
<td>15.42</td>
</tr>
<tr>
<td>Adult Education</td>
<td>80.98</td>
<td>11.11</td>
<td>14.71</td>
<td>8.93</td>
<td>14.47</td>
<td>10.33</td>
<td>5.52</td>
<td>7.23</td>
<td>15.52</td>
</tr>
<tr>
<td>Average-all Streams</td>
<td>17.62</td>
<td>13.85</td>
<td>14.10</td>
<td>10.62</td>
<td>14.01</td>
<td>12.38</td>
<td>9.05</td>
<td>13.27</td>
<td>14.75</td>
</tr>
</tbody>
</table>

**Source:** *Selected TAFE Statistics 1985*, Table 13, p 55 and Table 18, p 66

**Note:** The figure for the Adult Education stream for NSW should be ignored because teaching hours for the Board of Adult Education are not included, and the average figure treated with caution for the same reason.

Then, combining information on teaching staff salaries (Table 23 in the same publication) with the information on teaching hours and student contact hours two further tables may be produced (see Tables 3 and 4 below). These tables use as a proxy for actual costs the total cost of teaching staff salaries. As we shall see below, other cost figures will be larger and more appropriate; this figure is used only by way of illustration.

### Table 3: 1984 Teaching Salary per Student Contact Hour ($)

<table>
<thead>
<tr>
<th>Stream</th>
<th>NSW</th>
<th>VIC</th>
<th>QLD</th>
<th>SA</th>
<th>WA</th>
<th>TAS</th>
<th>NT</th>
<th>ACT</th>
<th>AUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>3.04</td>
<td>2.56</td>
<td>3.07</td>
<td>4.16</td>
<td>3.59</td>
<td>3.54</td>
<td>5.54</td>
<td>4.08</td>
<td>3.12</td>
</tr>
</tbody>
</table>

**Source:** *Selected TAFE Statistics 1985*, Table 13, p 55, and Table 23, p 73
Table 4: 1985 Teaching Salary per Teaching Hour ($)

<table>
<thead>
<tr>
<th></th>
<th>NSW</th>
<th>VIC</th>
<th>QLD</th>
<th>SA</th>
<th>WA</th>
<th>TAS</th>
<th>NT</th>
<th>ACT</th>
<th>AUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>53.54</td>
<td>35.41</td>
<td>43.34</td>
<td>44.12</td>
<td>50.36</td>
<td>44.52</td>
<td>50.16</td>
<td>54.09</td>
<td>46.01</td>
</tr>
</tbody>
</table>

Source:  
Selected TAFE Statistics 1985, Table 18, p 66 and Table 23, p 73

Note:  
The figure for NSW should be ignored because teaching hours for the Board of Adult Education are not included

These two tables support the view that in 1985 the cost of delivering a student contact hour in South Australia was high, but it should also be noted that the dollar cost of a teaching hour in South Australia was amongst the lower values across the country. Note also that the combination of low teaching hour costs and high student hour costs is associated with small class size. In other words, if TAFE costs in South Australia in 1985 seemed high, small class size had some explanatory power.

Of course, these ways of calculating delivery costs are very rough and ready, and take no account of differing infrastructures and other important factors. But a comparison across the States and Territories, and across years (since the data were available for previous years) would give the investigator some idea of what was going on and some hints as to fruitful directions for further exploration.

Further information on staffing was available in the 1985 publication, but it is not used here for comparative purposes. Other matters could be explored, but the above sets up a framework for comparison with currently-available data.

(ii) The situation today

A decade later, an investigator pursuing the same line of inquiry would find less information relevant to the inquiry in the equivalent publication. The latest edition, now titled Selected Vocational Education and Training Statistics, covers 1993 student activity, but financial data in it are available only for the previous year, 1992.

In the 1993 report far greater detail is available about student activity. For example, information about annual student contact hours is now available for each cell in a large (12 by 17) field of study/stream of study matrix which provides great detail about the content of the course and its level. This is an improvement on the much more highly-aggregated form used in 1985.

By contrast, staff teaching hours are now only reported in aggregated form, with no categorisation by field of study or stream of study. Thus, the published information would allow some calculation of proxy values of average ‘class size’ only across the whole student group rather than for sub-groups as in 1985.

Financial information is no longer available at a level which would allow the direct preparation of any of the cost tables provided above for 1985 (although it will later be shown that some comparisons of costs can be made). For 1992, financial information is reported from a Coopers and Lybrand collection, which does not allow any linking with student activity. Instead, the emphasis is upon reporting to accounting standards. Thus, for example, no information is
provided on salaries paid to teaching staff (there is in fact a one-line report on total salaries, but this is in a note which also deals with superannuation, finance charges, and so on) The 1993 publication is the first for which financial data are reported in this format.

In the previous year's publication, which included estimated 1992 financial data, it is possible to extract some information similar to that reported above for 1985 Thus 1992 data is used here, and the comparisons will be between 1985 data and 1992 data.

**Table 5: 1992 Data for Selected Variables**

<table>
<thead>
<tr>
<th>'Class Size'</th>
<th>NSW</th>
<th>VIC</th>
<th>QLD</th>
<th>SA</th>
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<th>TAS</th>
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</thead>
<tbody>
<tr>
<td>1723</td>
<td>14</td>
<td>16</td>
<td>18</td>
<td>87</td>
<td>12</td>
<td>05</td>
<td>13</td>
<td>82</td>
<td>11</td>
</tr>
<tr>
<td>$ per Contact Hour</td>
<td>4.42</td>
<td>3.11</td>
<td>3.77</td>
<td>6.29</td>
<td>4.63</td>
<td>4.19</td>
<td>6.68</td>
<td>5.25</td>
<td>4.17</td>
</tr>
<tr>
<td>$ per Teaching Hour</td>
<td>76.24</td>
<td>44.07</td>
<td>71.25</td>
<td>75.78</td>
<td>63.90</td>
<td>49.17</td>
<td>78.81</td>
<td>78.00</td>
<td>65.23</td>
</tr>
</tbody>
</table>

**Source:** Selected TAFE Statistics 1992, Tables T3 and T4, p.13, and Table AUS - 17, p 35

Consistently across the two years, the dollar cost of an hour is calculated using only the cost of teacher salaries, a significant under-estimate. In general, the pattern followed here is similar to that of 1985. Three changes might be noted particularly First, 'class sizes' have increased on average, though there is some variation between the States and Territories. Secondly, the cost of an annual student contact hour has also increased, though once again there is substantial variation. Thirdly, the cost of a teaching hour has risen very substantially in most States and Territories, but to a marked extent this is less so in Victoria.

If we combine the information to produce comparative tables from the different periods the variations become clearer. The changes in costs in Victoria and Tasmania seem relatively small in Table 6 as changes are compared over the seven-year period. A general upward trend in class-size is also not apparent for Tasmania This suggests the possibility that there have been variations in interpretations or reporting practices over the period Any investigation would have to pursue such possibilities more thoroughly than this initial analysis.

**Table 6: Comparative Data 1985, 1992**

<table>
<thead>
<tr>
<th></th>
<th>NSW</th>
<th>VIC</th>
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</thead>
<tbody>
<tr>
<td>'Class Size'</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1985</td>
<td>1762</td>
<td>13</td>
<td>85</td>
<td>14</td>
<td>10</td>
<td>18</td>
<td>62</td>
<td>14</td>
<td>12</td>
</tr>
<tr>
<td>1992</td>
<td>1723</td>
<td>14</td>
<td>16</td>
<td>18</td>
<td>87</td>
<td>12</td>
<td>05</td>
<td>13</td>
<td>82</td>
</tr>
<tr>
<td>$ per Contact Hour</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1985</td>
<td>3.04</td>
<td>2.56</td>
<td>3.07</td>
<td>4.16</td>
<td>3.59</td>
<td>3.54</td>
<td>5.54</td>
<td>4.08</td>
<td>3.12</td>
</tr>
<tr>
<td>$ per Teaching Hour</td>
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<td></td>
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<tr>
<td>1985</td>
<td>53.54</td>
<td>35.41</td>
<td>43.34</td>
<td>44.12</td>
<td>50.36</td>
<td>44</td>
<td>52</td>
<td>50.16</td>
<td>54.09</td>
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<tr>
<td>1992</td>
<td>76.24</td>
<td>44.07</td>
<td>71.25</td>
<td>75.78</td>
<td>63.90</td>
<td>49.17</td>
<td>78.81</td>
<td>78.00</td>
<td>65.23</td>
</tr>
</tbody>
</table>

**Sources:** Selected TAFE Statistics 1985, and Selected TAFE Statistics 1992

A closer examination of the published data indicates that **internally** there appear to be problems with the accuracy of reporting. Sections of the data which might be expected to match up give
results which appear nonsensical. We have, after all, taken data produced in different administrative areas and combined them as though their interrelationship had been thoroughly validated. This can be shown to be unsafe by considering particular comparisons.

For example, the 1992 publication reports (Table AUS-17) that in 1992 $33,961,000 was spent nationally on the salaries of library staff, and that the full-time equivalent library staff numbers were 822.81 (Table AUS-16), an average salary cost per FTE staff member of just over $41,000. On the face of it this appears possible, but the same table shows that in 1992 in South Australia a total of $56,000 was spent on the salaries of 54.2 FTE library staff, a figure so different that it shakes confidence in the national figure. This anomaly appears when we combine information from a staffing table (Table AUS-16) with information from a financial expenditure table (Table AUS-17).

It appears that combining information from different tables cannot be done without reservation, since consistent definitions of the "same" entity may not have been used in the preparation of each table. As such problems came to light, it became apparent that major reform was required.

The development of AVETMISS began in 1991, commencing with work on developing a new statistical standard.

3. The Road to Reform

Because so many parties have been involved, and because of the size and complexity of the vocational education and training sector, the achievement of reform seems to have been a slow process. It is important to acknowledge that the sector itself has been evolving during the period of reform, keeping up with this moving target has added to the difficulties of implementing reform.

Beginning in 1992, the NATMISS (NATIONAL Management Information Statistical System) project, a cooperative effort of the States largely funded by DEET/ANTA, sought to establish the information needs of the stakeholders through joint development supported by extensive consultation. The first phase in the use of the new AVETMISS (AUSTRALIAN Vocational Education and Training Statistical Standard) system commenced with data collection to the new standard in 1994.

AVETMISS describes standards for the collection, collation, and dissemination of data relating to the VET sector in four volumes published from November 1993. The standard itself is broken into two linked components (the Business module and the Resources module) and is being implemented in a staged way across an increasingly-complex VET sector. Business module data is planned to be collected in the "TAFE" area to the AVETMISS standard for the first time for 1994 data (collected in 1995), in the "ACE" sector for 1995 data, and in the "Private Provider" sector for 1996 data.

This broadening is in itself a substantial departure from the situation in 1985, when the publication was bluntly titled Selected TAFE Statistics, although even then the publication covered much more of the VET sector than "TAFE".

The Business module covers students (or "clients") and their programs of study. The Resources module covers three components: staff, physical resources, and finance.

1 Similarly, the 1985 publication gives the salary cost for the 34.9 FTE library staff in South Australia as $54,000.
Obviously the AVETMISS standard is intended to achieve many goals, which might nevertheless be reduced to more data, and more accurate data. Where more data are to be gathered, the principal reason for expanding the collection has been an expressed need by users. The AVETMISS data collection should provide more information in a more accessible form to more users.

The remainder of this paper deals with two further questions. First, will AVETMISS lead to the availability of data to meet the needs of researchers in the economics of training? Second, why has it taken so long to bring about reform when problems have been apparent for some time? In answering these questions it should be noted that the NATMISS project and the AVETMISS standard are not the first attempts at reform. The selection of 1985 for the introductory examples in this paper was no coincidence, as a new system of data collection was introduced commencing with the 1986 collection.

The 1986 reforms Prior to 1986, the publication Selected TAFE Statistics, was based upon paper returns from the various reporting authorities. These paper returns were collated into tables of a standard structure to allow comparability across Australia. From 1986 a computer-based collection began at the national level. This collection was based upon individual transactions occurring in the sector. For example, every time a student enrolled in a course an enrolment record was added to an enrolment file held by a reporting authority. At the end of the year the file for all enrolments was returned to the central authority (CTEC) which would generate a publication. Other files would record different kinds of transactions, so that by combining the information from the different files a general model of events in the sector could be constructed.

The new system was not fully implemented in the first year. In order to get the scheme rolling, only some of the planned files were collected. There were four files, which related to student enrolments, course details; institution details; and details of bulk enrolments (for which information about individual students was not gathered). Files planned, but not collected in 1986, included those relating to physical resources, staffing, and finance. In fact, the four files collected in 1986 remained the standard for collection until 1994.

What was the effect of the 1986 reforms on information available to those researching the ‘TAFE’ sector? The volume of information about student activities increased somewhat, although not to the extent proposed by the file definitions. In other words, what was gathered was rather less than would be implied from a reading of those file definitions. The information about finances (which remained a paper collection) was about the same, while the information about staffing (which also remained a paper collection) was substantially reduced.

The 1986 reforms were centrally driven; they were intended to meet central needs. This may have limited the support they were given. Overall, the achievements of the 1986 reforms were somewhat less than intended, although the improvement over the paper collection was marked and generally regarded favourably. Although the fine details of the intended reforms and the reasons for their failure are no longer recoverable, the experience should sound a warning about the potential for sub-optimum results from reform efforts.

The NATMISS reforms: The 1986 reforms did not bring about all the changes desired. They could only show the way towards more extensive reforms. Current reforms are a cooperative effort designed to serve a much broader range of information needs.

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2 This last reduction might have been in anticipation of an eventual increase when a computer-based collection was introduced.
The NATMISS reforms began in parallel with another development — the outsourcing of data collation. After the abolition of CTEC, responsibility for publication of the annual statistics was taken over by DEET, but by 1990 there was a belief that the statistics were not improving at the desired pace. The committee which oversaw the management of the statistics (JCTAFES, the Joint Committee on TAFE Statistics) was replaced by the Committee on TAFE and Training Statistics (COTTS), which had responsibility for management of the NATMISS project. The publication task was contracted out to the National Centre for Vocational Education Research Ltd (then the TAFE National Centre for Research and Development). By the end of 1993 new definitions were in place for the production of information within the Business module, and the collection of much more detailed data on the VET sector had become a reality.

But progress was not entirely smooth. Some data elements in the files within the Business module had to be treated as optional elements, which meant that reports on such variables could not be complete. This variability was a consequence of the limited capacity of reporting authorities to meet the demanding AVETMISS standard. Second, progress with the Resources module has not kept pace with progress with the Business module. Although it was intended from the beginning of the NATMISS project that there be a lag between the two, additional delays in the development of the Resources module meant that COTTS/ACVETS initiated some intermediate reforms as way-stations to the new AVETMISS standard for the Resources module.

A major reform came about through the introduction of the "Blue Book" exercise — the construction by a Task Force of a comprehensive and consistent collection of financial statistics. Although this new collection did not report current data in a way which allowed easy comparison with the 1985 data, a before and after comparison of 1992 data is persuasive of the value of the direction being pursued by ACVETS. Below, two of the tables used above in making 1985/1992 comparisons are augmented by expanded figures using the "Blue Book" methodology.

The estimate of costs used earlier has been replaced by an estimate which is somewhat higher, in order to be able to make comparisons between the old and new methodologies.

(a) Calculation 1 [Old] calculates the cost of an hour (whether contact hour or teaching hour) by dividing the total reported cost of VET activity by the number of hours, using the old (pre-Blue Book) methodology. Since some of the costs of VET activity can be attributed to activities other than the delivery of VET, this figure represents an upper bound, using the old methodology.

(b) Calculation 2 [Old(sals)] calculates the cost of an hour by dividing the reported cost of the salary expenditure component of VET activity by the number of hours, using the old methodology. Since some costs other than salary costs will be incurred in delivering VET activity, this figure represents a lower bound, using the old methodology.

(c) Calculation 3 [Blue] calculates the cost of an hour by dividing the total reported cost of VET activity by the number of hours using the new (Blue Book) methodology. Since some of the costs of VET activity can be attributed to activities other than the delivery of VET, this figure represents an upper bound, using the new methodology.

(d) Calculation 4 [Blue(sals*)] calculates the cost of an hour by dividing the reported cost

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3 Coopers and Lybrand were engaged as consultants to co-ordinate the collection.

of the salary expenditure component (including superannuation costs) of VET activity by the number of hours, using the new methodology. Since some costs other than salary costs will be incurred in delivering VET activity, this figure represents a lower bound, using the new methodology.

### Table 7: 1992 Comparative Methods: Cost of a Teaching Hour

<table>
<thead>
<tr>
<th>Bound</th>
<th>Method</th>
<th>NSW</th>
<th>VIC</th>
<th>QLD</th>
<th>SA</th>
<th>WA</th>
<th>TAS</th>
<th>NT</th>
<th>ACT</th>
<th>AUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Upper Old</td>
<td>145</td>
<td>88</td>
<td>155</td>
<td>175</td>
<td>132</td>
<td>81</td>
<td>166</td>
<td>169</td>
<td>131</td>
</tr>
<tr>
<td>2</td>
<td>Lower Old(sals)</td>
<td>111</td>
<td>68</td>
<td>105</td>
<td>115</td>
<td>95</td>
<td>67</td>
<td>124</td>
<td>123</td>
<td>97</td>
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<tr>
<td>3</td>
<td>Upper Blue</td>
<td>151</td>
<td>143</td>
<td>154</td>
<td>172</td>
<td>128</td>
<td>149</td>
<td>282</td>
<td>195</td>
<td>152</td>
</tr>
<tr>
<td>4</td>
<td>Lower Blue(sals*)</td>
<td>102</td>
<td>99</td>
<td>101</td>
<td>112</td>
<td>98</td>
<td>100</td>
<td>159</td>
<td>143</td>
<td>103</td>
</tr>
</tbody>
</table>

**Sources:** *Selected Vocational Education and Training Statistics 1993, and Selected TAFE Statistics 1992.*

**Note:** Superannuation cost have been included to bring apparently parallel figures closer together.

### Table 8: Comparative Costs of a Contact Hour

<table>
<thead>
<tr>
<th>Bound</th>
<th>Method</th>
<th>NSW</th>
<th>VIC</th>
<th>QLD</th>
<th>SA</th>
<th>WA</th>
<th>TAS</th>
<th>NT</th>
<th>ACT</th>
<th>AUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Upper Old</td>
<td>8</td>
<td>6.22</td>
<td>8.26</td>
<td>14.59</td>
<td>9.60</td>
<td>6.92</td>
<td>14.15</td>
<td>11.39</td>
<td>8.4</td>
</tr>
<tr>
<td>2</td>
<td>Lower Old(sals)</td>
<td>6.45</td>
<td>4.85</td>
<td>5.59</td>
<td>9.57</td>
<td>6.94</td>
<td>5.72</td>
<td>10.59</td>
<td>8.27</td>
<td>6.2</td>
</tr>
<tr>
<td>3</td>
<td>Upper Blue</td>
<td>8.79</td>
<td>10.15</td>
<td>8.21</td>
<td>14.33</td>
<td>9.28</td>
<td>12.75</td>
<td>23.94</td>
<td>13.15</td>
<td>9.7</td>
</tr>
<tr>
<td>4</td>
<td>Lower Blue(sals*)</td>
<td>5.94</td>
<td>7.03</td>
<td>5.36</td>
<td>9.34</td>
<td>7.10</td>
<td>8.55</td>
<td>13.51</td>
<td>9.68</td>
<td>6.6</td>
</tr>
</tbody>
</table>

**Sources:** *Selected Vocational Education and Training Statistics 1993, and Selected TAFE Statistics 1992.*

This very rough way of calculating costs, which deliberately ignores all the difficulties of dealing with complex activity, has a simple advantage in that its outputs are generally comparable. The calculated figures do represent upper and lower bounds, and these pairs of bounds suggest distinctions between the efficiencies of the various State and Territory systems. But the two methodologies yield different inter-state comparisons. For some States and Territories (e.g. Queensland) these upper and lower bounds are very similar, regardless of the methodology, for others there are substantial differences between results obtained using the two methodologies.

Common sense suggests a choice of one methodology over the other. For example, using the old methodology the unit cost of providing VET is higher in South Australia than in the Northern Territory, while the new methodology produces the opposite result. Since it is recognised that dispersed populations are more difficult and expensive to serve, the second result appears likely to be more valid. Further, using the old methodology, the unit cost of providing VET is very different in New South Wales and Victoria, while use of the new methodology suggests that the costs in these two States are, in fact, similar. Again the second
result appears more likely to be credible

Thus, although one cannot claim that one methodology or the other accurately represents the truth, a preference can be argued for. Although the AVETMISS standard is not yet fully in place, the first fruits of the work of COTT/ACVETS are apparent in that the new interim reporting system for finances appears to provide more satisfactory results. However, this is only an interim step towards improved reporting on the efficiency of the VET sector. What else is planned to be collected and reported? And will these plans allow the closer study of internal efficiency? In terms of what has been described above already there is room for substantial improvement beyond the present system. The relatively great distance between the upper and lower bound estimates would have to be reduced before significant analytical use was made of such data; several steps, already commenced, are intended to lead to such improvements.

(a) The use of 'salaries' (broadly defined) in the calculation of lower bounds, and of 'total expenditure' in the calculation of upper bounds, is clearly too loose. In the AVETMISS Resources module it is proposed to provide a 'direct delivery cost' which could be used as the appropriate dollar amount in such calculations. This follows from the observation that putting a teacher in a room costs more than the teacher's salary — consumable materials being only the most obvious single additional item. It will be necessary to negotiate carefully appropriate methodologies for the attribution of those other items which contribute to the direct cost of delivering VET. But the question of which items should be included in direct delivery costs remains unresolved.

(b) The task of defining direct delivery cost is relevant to another need. Universal collections of the kind for which the AVETMISS standard is being defined will not yield information on the cost of individual courses. However AVETMISS is being designed to yield more than highly-aggregated (e.g. over all courses) cost reports. It is planned to provide information about VET activity at a relatively low level of aggregation, defined by a classification of subjects into discipline groups. Previously the lowest-level training program entity reported nationally for the VET sector was the course. AVETMISS will report at the module/subject level, and the classification of modules is intended to be the key linking the various sub-systems of AVETMISS (recall the problem of the counting of librarians in South Australia — a common key would have eliminated this problem). Modules are to be classified by discipline group (a classification similar to that used for the Higher Education sector). Many reporting structures are to be organised at the discipline group level, and in particular it is hoped that direct delivery costs can be calculated and reported at that level. However, practical difficulties are expected in reporting at this level of detail. While it will yield cost details at a greater level of resolution, it also entails defining which items are to be included in direct delivery costs. Thus, it has been decided that items will be included if they can be attributed at the level of discipline group. This will lead to the exclusion of some consumable items which cannot be attributed at the required level. Accordingly it is to be expected that cost estimates will be slight under-estimates, but they should be negotiated so as to be consistent under-estimates.

(c) Other improvements will also enhance the accuracy of cost calculations. The new methodology for reporting in the finances sector already suggests refinements in reporting which were not previously available. For example, the reporting of student fees and charges using the Blue Book methodology reveals that the per capita level of student fees and charges in South Australia is high relative to the rest of Australia. (Perhaps any statements about the cost of the VET sector in South Australia should be adjusted in the light of such data.) Like other data items, fees and charges will be reported at the discipline group level, allowing much closer study.
4. Concluding Comments

The full benefits of AVETMISS will not appear immediately. Some stages of the reform process are inherently difficult. In the VET sector the national standard requires reporting on a calendar year basis, rather than a financial year basis, making any transition to a new system somewhat laboured. New classification systems, and new interpretations, require considerable bedding down. Furthermore, States and Territories are at various stages of transition to systems of accrual accounting (complete changeover is not due until the end of 1996), slowing progress towards improvement in the finance area. The very large volumes of data that will become available will take time to analyse and report. However the work of the NATMISS project is already bearing fruit, even though its first large component, the Business module of AVETMISS, has only just been put in place. Already, better understanding of the VET sector at a higher level of detail has become possible. Thus, the optimism of Burke and others is warranted.

References


National Centre for Vocational Education Research Ltd for the Australian Committee on Vocational Education and Training Statistics (1994), Selected Vocational Education and Training Statistics 1993, Adelaide
Pricing Options in NSW TAFE

Leo Maglen and Chris Selby Smith
Faculty of Business and Economics, Monash University; and Monash-ACER Centre for the Economics of Education and Training

1. Introduction

In October 1994 the NSW TAFE Commission requested a review of which of its "programs should be publicly subsidised and which programs should be fully 'user pays'". The review analysed the economic issues involved, examined the respective responsibilities of the various stakeholders and identified strategies to achieve greater efficiency and equity.

2. Conceptual Issues

There are five major groups of stakeholders in vocational education and training (VET) in Australia: (i) governments, both national and state, as the major funders of VET, and those who are driving the training reform agenda; (ii) the TAFE sector, as major providers of VET in Australia; (iii) private VET providers, who are beginning to play a much larger role in the burgeoning training market in Australia; (iv) employers, in both the public and private sectors, who are the users of trained personnel, providers of on-the-job training, and, increasingly, active participants in the design and implementation of off-the-job training, and (v) the students and trainees themselves.

Three basic sets of considerations are addressed in this section. The first relates to the distinction between general and specific training, which is relevant to the distribution of training costs between trainees and training firms. It was first articulated by one of the pioneers of the economics of education, Gary Becker, in 1964. General training is training that imparts skills that are employable not only in the firm conducting the training but also in other firms using similar types of labour. Specific training, on the other hand, raises the productivity of trainees within the training firm, but the skills it imparts cannot be applied anywhere else. A lot of training, of course, has both general and specific elements. Becker contended that in a perfectly competitive labour market a firm would conduct general training but not finance it, since it would not be in a position to earn an acceptable return on its investment. The trainee, on the other hand, would be in that position, and so would agree to bear the full cost of the training. The situation would be the reverse in the case of specific training— the training firm could earn an acceptable return on its investment and therefore would be in a position to fully finance the training undertaken.

In a world of uncertainty and less than perfect labour mobility the difference in the cost sharing and wage patterns between generally and specifically trained workers may not be as marked as

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This is drawn from a report commissioned by the NSW TAFE Commission in October 1994. For an extended discussion see L.R. Maglen and C. Selby Smith, Pricing Options in NSW TAFE, Working Paper No. 1, Monash-ACER Centre for the Economics of Education, C/- Faculty of Education, Monash University, Melbourne, 1995.

the original Becker model predicts. Nevertheless the broad propositions that arise out of the distinction are still useful. First, workers have an incentive to at least contribute towards the costs of their training to the extent that the skills they acquire are generally marketable. Such would be the case in most pre-employment, pre-vocational, apprenticeship and traineeship programs. Secondly, firms will be reluctant to pay for any sort of training on which they do not consider they will be able to earn an adequate return. Thirdly, firms will even be reluctant to provide general training if they cannot pass on the costs to, or at least share them with, the workers to be trained, (or another interested party). It is obvious that labour mobility is a crucial consideration in determining who will bear the costs of training.

Both efficiency and equity considerations are involved in determining the role that governments should play in the provision and funding of VET. In practice what we observe is that, both in Australia and overseas, governments across the whole spectrum of political viewpoints take an active, indeed dominant role in both the provision and financing of VET. Even when there is strong commitment to establish a viable and healthy training market there is no serious suggestion that governments should completely get out of the business of providing vocational education and training. Acceptance of a continued role for public provision does not imply, however, that the services being provided should be free of charge (or at only nominal cost to the users) or, indeed, should automatically qualify for any level of public subsidy. Justification of public funding of training — either to supplement funding by firms and trainees, or to substitute for either or both of these other sources — is generally offered on the grounds that (a) unsubsidised training markets inevitably lead to serious underinvestment in training by both firms and individuals, and/or (b) unsubsidised training markets typically restrict access to training to an unacceptable extent, and would be inherently inequitable.

There are efficiency arguments that training generates significant externalities that a privately financed market would fail to take into account. These externalities could be associated with education in general or more specifically related to VET. A priori reasoning suggests the latter are likely to be more significant than the former. It has also been argued that training markets would operate under an abnormally high level of market imperfections (such as the existence of legislated minimum wages; poaching, lack of knowledge of the true value of training, by individuals or firms; capital market imperfections affecting trainees or firms, and higher levels of risk-aversion among workers and firms than for society as a whole. In addition, it has been argued that the provision of training involves significant economies of scale. Firms may not provide enough training (irrespective of whether it is general or specific) because they lack the specialised physical facilities, the specialised managerial, supervisory and instructional expertise, the financial resources or the capacity to cover for employees off the production line while they

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undertake training. These deficiencies tend to be greater in smaller firms, but may be less of a problem in larger ones.

From an equity perspective it is frequently argued that VET has an important role to fulfil in meeting the educational and/or training needs of the disadvantaged and unemployed, and providing an alternative to general academic education. The role can contribute to performing the vital economic function of providing as efficiently and effectively as possible, the skills needed to improve the productivity, adaptability and employability of workers, to enhance the competitiveness and profitability of firms, and hence raise the performance of the whole economy. To the extent that this role is a legitimate function for TAFE it should be costed and funded separately from its economic mission. Making TAFE's community service obligations explicit, and funding them separately, minimises the consequences of any incompatibility that may arise between the two sets of objectives, and reduces the inconsistencies and confusions that can become apparent in the pricing of training courses.

Since the NSW TAFE Commission looks and acts like a public utility, and enjoys a near, if not a natural, monopoly over many of the services it provides, reference is made to theories of public utility pricing. Pricing according to the marginal costs of production is the criterion used by unsubsidised profit maximising private firms under competitive conditions. Ceteris paribus, this will result in a socially optimal allocation of resources. Total surplus is maximised when price is set equal to marginal cost; deadweight loss measures the cost to society of a decision not to set prices equal to marginal cost. Although the practical problems of estimating marginal cost can often be substantial, the economic principles are clear-cut. Causal responsibility is the essential criterion of what belongs in marginal cost, and what does not. All purchasers of any commodity should be made to bear such additional costs (only such, but also all such) as are imposed on the economy by the provision of one additional unit. Note, however, that the rule of setting price equal to marginal cost does not necessarily produce optimal results if it is applied only partially. This result, that total surplus is maximised when price is set equal to marginal cost, continues to hold when allowance is made for non-zero cross-elasticities of demand between services and for marginal costs that vary with the level of output. For a utility (such as TAFE NSW) that produces more than one product, the allocation of overheads which defines fixed cost is necessarily arbitrary: obviously this can affect the measured marginal costs.

A pricing scheme that maximises surplus can cause the firm to incur a loss. In general, whenever average costs are declining with increasing output — and this would be a typical situation in TAFE NSW — marginal cost is less than average cost and organisations which pursue a marginal cost pricing policy will fail to break even. Efficient public utility pricing may then require that prices be set so as to maximise total surplus subject to the constraint that the firm at least covers costs from its sales revenue. The literature argues that if constant marginal costs and independent demands can be assumed, prices be increased to cover the fixed costs more in markets with low price elasticities of demand than in markets with relatively high price elasticities. This strategy alters markets as little as possible from the equilibrium providing the highest possible value of total surplus, i.e. price-equal-marginal cost. The Inverse Elasticity Rule (or Ramsey pricing) argues that for any pair of markets served by a regulated firm, the percentage deviations from marginal cost, weighted by the price elasticities of demand, should be equal for both markets to the markup. Although Ramsey pricing can be extended to the case where demands are not independent and where marginal costs are not constant, the analysis becomes more complicated. Instead of the simple own elasticity terms, the markups are weighted by "super-elasticity" terms, which depend not only on the cross-elasticities, but also on

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6 These aspects are discussed in more detail in L R. Maglen and C Selby Smith, Pricing Options in NSW TAFE, Working Paper No 1, ibid, pp 8-15

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the prices and quantities themselves. However, the fundamental reasoning remains that where a small change in price would alter consumption comparatively little (compared to the situation where price is equated to marginal cost) receive high markups (and conversely). The change from including the cross-elasticities is that when a rise in price exerts a large distorting effect in other markets then a low markup is in order, even if the price elasticity of demand in the original market is quite low.

Consideration is also given to three other matters. First, a model that presumes the industry sells all its production to final consumers is not descriptively accurate for many public utilities. In such cases it is important to consider not only the direct but also the indirect effects of price changes for the utility's services. Different customers can be affected through downstream market equilibrium relationships. In the particular case under consideration here movements in the fringe boundary between TAFE NSW and alternative suppliers may be an important outcome of competition, including pricing strategies.

Second, a practical problem concerns the allocation of costs to particular services, where substantial amounts of cost represent facilities which are used in common by several or all services (e.g., the library for a TAFE college, or departmental administration for courses provided by that department) and which cannot be allocated in a clear cost-related way to any single service. It is standard practice to break the cost of the firm down to the attributable cost of each service and common costs, unattributable to a particular service (i.e., fixed costs). Much of regulatory practice, however, requires that each service be assigned a portion of the common cost and that the revenues of that service equal the cost figure given by the sum of its attributable cost and its share of the common costs. In Ramsey pricing the common costs are covered: each service makes a contribution to covering common costs (depending on its price elasticity of demand), so that the firm breaks even overall. Under fully distributed costs — where the common costs can be distributed in a number of ways — common costs are allocated to services and prices are set so that each service just covers its fully distributed costs.

Third, there is the game theoretic approach, which seeks to define cross-subsidies, to compute prices which do not cross-subsidise (i.e., are 'subsidy free') and to provide tests for whether or not given prices are subsidy free. The crucial question is whether there exist sets of prices for membership of the coalition which keep members from defecting from the grand coalition (N) to form other, smaller coalitions. Each possible subcoalition has its own stand-alone cost and cannot be charged more than that, while the monopolist serving the N players must break even. The analysis can be broadened to include price structures which permit prices to be varied not only between markets, but also between consumers in the same markets. However, we assume that this is not a matter of current interest to TAFE NSW, at least at this time, and therefore have not pursued it further. Note, however, that relative to a uniform price regime where price exceeds marginal cost, an appropriately designed non-uniform price schedule can make all consumers and the firm better off.

In relation to implications for TAFE pricing policy the analysis suggests five points. First, it is important to take account of the relationship between marginal costs and benefits when determining the quantities to be provided. Knowledge of incremental costs and benefits from expanding or contracting TAFE activities is the sine qua non of efficient production. Second, fixed costs and how they are funded are likely to be significant, particularly in situations where higher levels of output can be produced at progressively lower levels of cost. Third, the analysis.

draws attention to the elasticity of demand for different TAFE products i.e. the extent to which
demand alters as the price is varied. Fourth, both efficiency and equity objectives need to be
borne in mind (and they need not be in conflict). Finally, it can be important (and is likely to
be in the specific case of TAFE NSW) to consider the extent of provision of different TAFE
courses in terms of their effects on skill-mix and on other economic activities, firms and regions.

3. The Present Position in New South Wales

In this section some relevant aspects of the present situation in NSW are noted. First, during
1989 the NSW Premier and Treasurer published a Cabinet-endorsed document outlining the
principles for classifying State Government organisations. It also specified the controls
considered appropriate for each category of organisation. TAFE NSW — being heavily
subsidised and monopolistic (see Appendix A, p 36) — was classified in the inner Budget sector,
with maximum controls on both inputs and outputs. There appears to be a clear implication that
the more TAFE NSW activities, or some activities such as TAFE PLUS, operate on lower levels
of subsidy and on a more competitive basis with alternative suppliers (e.g. private providers or
other state TAFE providers) the lower the level of input and output controls to which they will
be subject. Ceteris paribus, they are then likely to be more flexible in meeting market needs for
education and training, less bureaucratic and more autonomous. Economic theory strongly
suggests that under such conditions higher levels of efficiency in the use of scarce resources are
likely to be achievable.

Second, the NSW TAFE Commission provides its courses and programs through Institutes
covering defined geographical regions within NSW. Each Institute is provided by the
Commission with a budget related to its educational profile. It is for the Institutes to work out
their educational offerings and to market them in their region (consistent with the Commission's
overall educational profile, which is increasingly guided by state and national VET strategic
planning and funding bodies). Major policy decisions such as the pricing of mainstream
programs and the employment conditions of TAFE NSW teachers are ultimately determined by
the Minister. Other policy decisions are determined by the Managing Director with the advice
of the Policy Executive which primarily consists of the eleven Institute Directors. There is some
competition between Institutes, but little competition within Institutes. The Institutes are
expected to keep in touch with their local regions, to develop courses and training programs
which meet local community, business and industry needs. The Institutes are also intended to
link TAFE NSW with other educational bodies and ensure that TAFE courses and qualifications
are in line with what is happening in the schools, universities and industries of the region.

Training Divisions are the direct links TAFE NSW has with industry. Although each of the
thirteen training divisions covers a broad industry and training area for the State as a whole, it
is located within a particular Institute. Each training division is represented by a number of
industry specialists and principal officers who work in specific skills and training areas. The
training divisions consult with relevant industry boards, councils and community consultative
committees to determine new and emerging education and training needs. Industry specialists
are frequently members of the (tripartite) Industry Training Advisory Boards (ITABs) which
advise governments on training matters and priorities. Training divisions approve courses run
by Institutes through their college locations — the only way a college can have a course

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8 For a more extended discussion see L. R. Maglen and C. Selby Smith, Pricing Options in

9 NSW Government, Classification and Control of State Organisations, NSW Government,
Sydney, June 1989.
accredited is through the relevant training division. They develop courses and training programs which suit particular industries, jobs or specialist areas. They also have a responsibility to ensure that quality standards are met across the State in relation to the area of their particular expertise. They act as advocates for particular skills and industries within the TAFE system and within the existing parameters affecting demand (including the heavily subsidised level of prices and charges).

Third, the programs and services of the NSW TAFE Commission are funded predominantly by the NSW State Government, although the Commonwealth Government funds more than half the capital works program and some of the Commission's recurrent expenses, mainly through programs for the unemployed and other disadvantaged groups. Total expenditure was $989 million in 1992-93. Recurrent expenditure totalled $852 million, of which 71.4 percent was from the State Government ($614 million for staff salaries and related payments and $238 million for maintenance and working expenses). Of total recurrent funds $176 million came from Commonwealth grants. Expenditure on capital works totalled $137 million ($79 million from the Commonwealth). In 1992-93 revenue from commercial activity of the Commission, including customised and enterprise-specific training programs for industry increased significantly to more than $19 million. Additional sources of revenue included almost $30 million from the student administration fee. Commonwealth-funded fee-for-service programs expenditure amounted to over $64 million, while programs provided on a fee-for-service basis to other State government agencies such as the Building Services Corporation and the Departments of School Education, Corrective Services and Health amounted to more than $14 million. During 1992-93 TAFE NSW also enrolled about a thousand full-time international students from 35 countries (over a quarter from Hong Kong and nearly half from Hong Kong and Indonesia). Gross income to TAFE NSW was $85.5 million.

The NSW TAFE Commission operates a different pricing policy for each of its three main types of program. The great majority of students in TAFE NSW are in the traditional mainstream courses. In these programs, which are open to all and where students are selected on academic merit, costs of provision are very heavily subsidised. There is no differentiation in the level of charges to reflect variations in provision costs, except that the general charge of $75 per student per semester ($140 per annum) per course at certificate or advanced certificate level is $225 per semester (or $450 per annum) at associate diploma or diploma level. Until 1988 there had been no charge at all. Students are eligible for income support from the Australian Government. Charges are set centrally for the TAFE system as a whole, and individual Institutes, colleges or campuses are not permitted to vary them in the light of particular local circumstances.

The NSW TAFE Commission provides a range of labour market training programs designed to improve the further training and employment prospects of the unemployed. Enrolments in labour market training programs in 1992 included more than 10,000 in Jobtrain, more than 6,000 in Get Skilled and more than 3,000 in a total of 273 ATS traineeship courses. We were informed that the Commonwealth tends to reimburse TAFE NSW for the incremental costs of providing national labour market programs. However, it appears that marginal costs would be difficult to calculate. In any case the Commonwealth appears to make no contribution to overheads and thus appears to violate both the Ramsey and fully distributed cost pricing rules.

TAFE PLUS is the commercial arm of TAFE NSW and was launched in February 1992. It competes in the market place as a fee-for-service operation focusing on skills-based vocational training and provision of particular services developed for specific customers (i.e., enterprises). TAFE PLUS provides short courses, custom designed courses to satisfy specific requirements, consultancy services, and supplies training materials, qualified and experienced trainers, and TAFE facilities. TAFE PLUS services are offered state-wide, make use of TAFE NSW's extensive range of resources, are recognised throughout Australia and meet the requirements of
the Training Guarantee Act. A wide range of courses are provided. While TAFE PLUS activities have been growing rapidly, they are still only a small proportion of total TAFE Commission activities. TAFE PLUS charges much higher fees than mainstream courses (or labour market programs), although it is not clear whether full costs are covered, whether incremental costs are always covered and whether the substantial variations in the fees charged for different courses conform to a common pattern of profit over costs of provision (or subsidy). Student assistance is generally not available to those enrolled in TAFE PLUS courses. On the other hand, costs and charges are likely to be tax deductible to participating trainees and their employers.

Fourth, it is important to recognise that whatever the outcome any set of procedures for the pricing and administration of a program is designed to achieve, the response it actually provokes will be largely determined by the incentives for each of the stakeholders that are built into those procedures. The incentive patterns could influence the actions of individual trainees and TAFE staff; enterprises and private providers; Training Divisions, Colleges and Institutes; or the NSW TAFE Commission itself. For example, if extra work yields benefits to colleges or the wider TAFE system but not to individual staff, then their willingness to develop and sustain additional programs is likely to be reduced. Some of the possible incentive patterns which were identified under the current pricing arrangements in TAFE NSW may be mitigating against the effective development of TAFE PLUS.10

4. Options for the Financing of Training

When considering the range of funding options that are open to governments it is important to keep firmly in mind the distinction between the provision of training and the funding of training. Figure 1 summarises the combinations of public (i.e. government) and private provision and funding that are feasible with respect to training; it locates the two ends of the spectrum. The public provision/public funding combination represents training that is wholly provided through public training establishments and financed out of general government revenue. This more or less characterises the current position with respect to mainstream TAFE courses. The private provision/private funding combination represents training that is wholly provided and funded privately, either by private training establishments selling training programs at full cost-recovery prices, or by enterprises running self-contained in-house training programs for their employees.

Figure 1 also identifies a range of options that are open for policy makers to consider, and arranges them according to the directions in which they lead.11 There are basically four broad directions which governments can take. First they can retain the status quo, but expand, diversify and/or stabilise the public revenue base for training; that is, select options 1 or 2. Second, they can continue as the major training providers, but seek a greater degree of cost-sharing; that is, select options 3, 4 or 5. Third, they can use public funds to encourage greater private provision of training; that is, select options 6, 7, 8 or 9. Finally, they can seek to encourage both greater private provision and greater private funding of training. Note that these options are not mutually exclusive and combinations are quite common.

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11 Further discussion of the alternative provision and funding options is contained in L.R. Maglen and C. Selby Smith, Pricing Options in NSW TAFE, Working Paper No 1, ibid, pp.32-33.
In the specific context of TAFE NSW three longer-term options were identified. Under the first option the NSW TAFE Commission could decide to continue with present financing arrangements. This involves a mixture of mainstream TAFE courses, labour market programs, TAFE PLUS and VET provision in industry.

Mainstream courses are provided currently on the basis of virtually complete subsidisation of the financial costs of provision. It seems highly unlikely that this level of subsidisation is matched by the proportion of spillover rather than private benefits in the total benefits from VET. There are strong incentives for trainees and employers to accommodate to the mainstream courses that are available. There is no clear resource allocation rationale for the pattern of courses provided. No attempt is made to balance the costs and benefits of different courses, at the margin, or with respect to the courses provided in different locations, firms, industries, etc. To the extent that community service obligations are pursued they are diffuse, and often embodied in general policies across-the-board (e.g. low fees for students in all courses), rather than tightly targeted on specific access or equity objectives.
TAFE PLUS courses are clearly meeting an education and training need, and they have grown substantially from $1 million in 1990/91 to $23.8 million in 1993/94 (although this growth is from a small base and the amounts are small compared to the $0.9 billion budget of the Commission and the $100 million or more from other income streams). TAFE PLUS courses provide the opportunity for local TAFE NSW Institutes (colleges and campuses) to respond flexibly to emerging needs, although it is not clear how much of the potential advantages are actually being gained at the local level. However, their inconsistencies and incompatibilities with TAFE mainstream courses are becoming increasingly apparent. These include the very wide variation in charges for similar activities classified in the two different streams, and the differential treatment of different industries, skill-mixes or localities. It is obviously in the interest of firms to see that potential TAFE PLUS courses are provided as TAFE mainstream courses, even if this means that a course has to be modified somewhat (so that it may not be exactly what they want).

Labour market programs provided by TAFE NSW are clearly serving a worthwhile purpose, but it is not apparent that receipts are fully covering the costs of provision, including an appropriate contribution to overheads or fixed costs.

In relation to provision of VET in industry the present arrangements provide a strong incentive to transfer it into the publicly-funded sector, whenever possible, so long as not too many compromises are made in the training provided. The Training Divisions of TAFE NSW, among their other functions, are actually charged with the responsibility of assisting firms, unions and industry bodies to achieve this outcome. In the longer-term, this probably tends to reduce knowledge of education and training in industry, and so lessens the willingness of industry to support training. The present arrangements also imply a restriction on the expansion of VET due to limitations on public funding, especially at the state level, given the vertical imbalance of fiscal resources and responsibilities in Australia. Such a pattern of incentives runs directly counter to the recommendations of the Hilmer Report and the objective of achieving a level playing field training market for VET.

A second option has been identified within TAFE NSW by the Working Group to the Curriculum Strategy Group which reported in September 1994. The Working Group proposed that, for each initial training course on the National Training Board Register and accredited for mainstream delivery by TAFE NSW, the State Manager of the sponsoring training division may select a group of generic modules, which will be identified as being "Commercial fee exempt" (CFE). CFE status is attached to the module: it applies whatever the course in which a student enrolls. The Working Group proposed that CFE modules be delivered by Institutes for the same charge as for mainstream delivery, together with the additional actual marginal cost to TAFE of the delivery mode employed (provided that the delivery is part of a contractually agreed training plan). Although proposed for a trial period of two years, it was not advanced as a transitional approach to a more cost-reflective pricing structure throughout TAFE NSW. Rather, the proposal represents a retreat towards the more traditional, high-subsidy public funding/public provision model. Such an arrangement, if introduced widely, as appears to be proposed, would provide strong incentives for firms and industries to transfer training into the heavily subsidised TAFE system where possible. The physical, human and financial resources available to meet such additional demands might limit the scale to which it

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could be developed in practice. It would do nothing to enable more flexible responses to be achieved at the local level in TAFE NSW. The development, and perhaps even the continuation, of VET provisions by alternative providers would be severely disadvantaged. It would not address the current inefficiencies in resource allocation within TAFE NSW (and seems likely to further entrench them). It is not clear how the proposal would achieve specific equity objectives and, by diverting additional resources into general subsidies (including to those who do not need them to undertake education and training), it could result in a lower level of resources being available to pursue specific targeted equity objectives. The proposal thus has deficiencies from both efficiency and equity perspectives. It does nothing to encourage improvement in the available information (e.g., on costs, benefits of training, or the elasticity of demand). It moves TAFE NSW in a direction contrary to that proposed in Hilmer, advocated by ANTA and adopted by the Council of Australian Governments.

The third option involves the adoption of more cost-reflective pricing in TAFE NSW, including in its mainstream courses and labour market programs. This is consistent with the approach being taken in other public utility areas by the State Government see, for example the NSW Government Pricing Tribunal report on water charges which stresses, *inter alia*, the desirability on efficiency grounds of unwinding existing cross-subsidies: moves to more cost-reflective charges, improved knowledge about incremental costs of expanding (or contracting) output, importance of transitional arrangements, and scope for very substantial productivity gains to be achieved. An approach towards more cost-reflective pricing in TAFE NSW is predicated upon improvements in the costing information which is available, so that managers are aware of the incremental costs of changes in the provision of VET. Attention also needs to be given to the proportion of benefits derived from VET by the major stakeholders (especially employers, trainees and governments) and to estimates of the elasticity of demand in broad areas of VET.

Using 1992/93 aggregate data for TAFE NSW, fee revenue from students was some 4 percent of costs of provision (recurrent costs only)\(^{14}\) i.e., 96 percent of the recurrent costs were being borne by the Government rather than by other stakeholders (trainees and firms). No doubt some expenditure is properly attributed to the pursuit of specific equity objectives such as greater access.\(^{15}\) If the somewhat generous assumption is made that this is $200 million per annum, then fees still represent only 5.5 percent of recurrent costs in 1992/93. In our view it is highly unlikely that so high a proportion of the (marginal) benefits are spillovers, and such a small proportion accrues to trainees and firms.\(^{16}\)

Moreover a more cost-reflective pricing system for Commonwealth labour market programs provided by TAFE NSW might lead to a larger contribution to overall overheads (the data available was insufficient to warrant a definitive conclusion). A more cost-reflective pricing system could also enable greater devolution of authority, increased decentralisation of

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\(^{14}\) i.e. ($852m recurrent expenditure — $104m) compared to $30m raised from Student Administrative Fee. The $104m is total revenue in 1992/93 from Commercial Activities, Commonwealth Labour Market Programs, Fee for Service Provision for Other State Departments and Fees from Overseas Students. It is assumed that these revenues equal the incremental costs of providing the courses.

\(^{15}\) It would also be possible to identify certain other purposes and explicitly pursue them (including through higher levels of subsidy) e.g., training in small businesses, in non-metropolitan areas or in particular industries.

\(^{16}\) If the proper division was half and half additional resources could be explicitly targeted to pursue access and equity objectives. There could be, as a consequence, improvements in both efficiency and equity.
responsibility, improved incentives 'at the chalkface', enhanced ability to adjust capacity locally and greater facility to meet the enormous variety of VET demands on a flexible basis. It would also obviate the need to make decisions as to whether a course is mainstream, and therefore attracts a full subsidy, or is TAFE PLUS, and so attracts none at all.

Even if a decision was made to move in the direction of a more cost-reflective pricing structure, it would be a direction for change not an overnight adjustment. Careful thought would need to be given to appropriate transitional arrangements. Five examples are given of the sort of changes that could be adopted, as opportunity offered. First, the knowledge base of TAFE NSW could be improved, at both central and local levels, about the costs involved in incremental changes to VET provision (i.e. the marginal costs of change). Second, those targeted for increased charges might include Commonwealth labour market programs, high income students, repeating students, students who already have a first degree and are in employment. There is considerable scope for price discrimination by TAFE NSW amongst students on mainstream programs. Third, there could be movement towards charges which reflect the differential costs of VET provision, and away from the current flat rate pattern of charges. Fourth, greater autonomy could be delegated at local level to respond to the signals being generated through the pricing structure i.e. if charges reflect costs, provision is indicated where demand covers charges. This implies raising the priority given to the demand side, and involves the provision of incentives for those who respond appropriately to market signals. Fifthly, part of the extra resources resulting from higher charges could be made available to pursue specific access and equity objectives. It is quite possible to improve efficiency while maintaining or even enhancing equity.

5. Conclusions

There is a wide range of stakeholders involved in the TAFE NSW system, especially trainees, firms and governments. The study raises doubt as to whether the distribution of the benefits from VET courses is reflected in the distribution of the costs borne by the various stakeholders, and so provides little justification for the 'all-or-nothing' distinction between TAFE mainstream courses and TAFE PLUS.

The study noted the organisation and funding of TAFE NSW, and contrasted it with an analysis of the economic issues involved. It appears that it would be possible to improve both efficiency and equity.

A range of broad options for funding VET which are open to governments was presented. Three specific funding options for TAFE NSW were then considered: continue with present arrangements; adopt the Commercial Fee Exempt proposal for TAFE PLUS, or move towards more cost-reflective pricing (with associated reforms). A range of arguments were advanced, noting the potential efficiency and equity advantages from adopting the third option, and emphasising the importance of appropriate first steps and transitional arrangements.
The Economics of Vocational Education and Training in Australia:  
A Review of Recent Literature

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1. Introduction

This paper draws on a report prepared for the Australian National Training Authority by the Monash-ACER Centre for the Economics of Education and Training in 1994 (Burke et al 1994). The report reviewed the literature and data relating to the economics of vocational education and training (VET) in Australia. Subsequently the Centre prepared an annotated bibliography (Ferner et al 1994).

Although the literature is large, much of it relates to a period prior to the recent substantial changes in policy and organisation. Nevertheless, the review provided some guidance as to where gaps in our knowledge currently lie. Note that much of the literature and data referred to ‘relates to’ the economics of VET in Australia rather than being explicitly directed to research on the economics of VET.

This paper is divided into seven sections, of which this brief introduction is the first. Section 2 considers macro changes in employment in Australia and how they might relate to VET. Section 3 considers changes in the economy at a more micro level and in particular the effect of modifications to work organisation and structural change on skill requirements. Section 4 considers the effects of economic change on equity and the implications for VET, especially in relation to women, migrants and the long-term unemployed. Section 5 considers the internal efficiency of vocational education and training, its costs and outcomes. Section 6 considers the financing of VET and its relationship to the development of a training market. Section 7 draws on previous sections to construct future research priorities.

2. Macro Changes in Employment

This section considers changes in employment in recent years, with particular attention to measures of workforce skills; likely changes in the demand for labour in the next decade; and the relation of these changes to the structure of education and training and targets for 2001 and beyond (see Burke et al 1994, pp.4-27).

(a) Measures of Workforce Skills

In the decade from 1983 to 1993 the population aged 15 to 69 grew by 20% and the labour force grew 24%, but the labour force with qualifications grew by 51%. Although employment grew by 23%; full-time employment grew only 14% in contrast to part-time employment, which grew by 68%. From the recession year 1983, the number of unemployed grew by 35%. Occupations with the highest rate of growth tended to be those whose workers have above average levels of qualifications (see Sweet 1987, Aungles et al 1993). The labour force participation rate of women rose substantially. Women were 32% of the labour force in 1970, 37% in 1983 and 42% in 1993.
In the same period, the labour force with post-school qualifications increased from 39% to 51% (see Burke et al 1994, Table 2, p.7). Degree holders increased from 8% of the labour force in 1983 to 12% in 1993, persons with trade/technical qualifications from 30% to 38%. Note that a large number of higher education graduates proceed to TAFE courses (Golding 1994) and that the data refer to highest level of qualification. Notably, while 51% of the labour force held qualifications, only 43% of the population aged 15-69 did so.

Persons with qualifications, especially females, have considerably higher rates of labour force participation and employment than those without qualifications. Also, the rate of unemployment is lower and its duration is shorter for persons with qualifications. In the twenty years to 1989-90 about a million additional full-year full-time jobs were created in Australia, about 70% of the half going to males and 30% of the half to females went to graduates (Maglen et al 1994). Persons holding post-school qualifications also on average have higher incomes.

As far as individuals are concerned a qualification, particularly a higher education qualification, has tended to lead to superior employment opportunities and earnings. However, if employers use qualifications to a substantial extent just to select the inherently able then the superior earnings of graduates are not necessarily an indication of the need in the economy for degrees rather than TAFE qualifications (see Maglen 1990; 1993).

The data on qualifications do not include the training that does not lead to a formal qualification. Expenditure on training by employers was estimated at over $3700 million in 1990 (ABS 6353 0 and Burke 1992 17) or nearly 1% of GDP (0.5% excluding wages and salaries paid during off-the-job training). The estimates exclude on-the-job informal training (c.f. about 1% of GDP spent by governments on Higher Education, 0.5% on TAFE and around 0.5% on years 11 and 12 in secondary schools). An estimated 79% of the workforce in 1989 undertook some training, much of it informal and on-the-job (ABS, How Workers Get Their Training, 1989, see also Baker and Wooden 1992). The probability of workers receiving training rises with the level of qualification and with hours worked. Only 18% of employers with less than 20 employees reported training expenditures compared with 92% of employers with 100 or more employees.

(b) Changes in Demand for Labour and its Implications

In 1991 the ABS projected that the total labour force would grow about 20% 1991 to 2001, but those aged 15 to 24 would decline in absolute numbers and substantially in proportion. By 1993, the large majority of those who would be in the labour force in 2001 had already had experience in the labour force. DEET (1991) in a study of Australia's Workforce in the Year 2001 projected total employment to grow by 16% 1991 to 2001. The demand for graduates was projected to grow by 27%, the demand for persons with 'technical' qualifications by 18%. They projected growth substantially greater in the labour force a 50% increase in degree holders and a 27% increase in 'technical' (1991, p.72).

Burke et al (1994, pp 15-18) discuss the recent levels of enrolments in the major sectors of post-compulsory education. The school system as a whole has been growing slowly, but this disguises the growth in upper secondary enrolments in the last decade. Within higher education, growth has been fastest in postgraduate enrolments and there has been a relative swing away from teacher education towards business and more recently engineering and science. In TAFE there has been a relative decline in enrolments by persons aged less than 20 who have been accommodated in schools and universities and a swing towards associate diploma courses and away from trade courses.

Targets and/or projections are considered by Finn (1991), Carmichael (1992), Cullen (1992) and Burke (1992a, 1992b, 1993) see Burke et al (1994, pp.19-21). Given the inadequacy of the
available data such projections must be regarded, at best, as fairly gross approximations.

Cullen (1994) estimates that, consistent with the Finn/Carmichael target, 79% of the labour force aged 25-34 will hold qualifications beyond 2001, nearly 30% with degrees and 49% with VET qualifications. Cullen proposes 49% as a long term target for the whole labour force, with a target of 41% by 2001. To achieve 41% would require expansion in VET beyond current proposals.

Two recent studies relevant to the size and structure of education and training in Australia are those by Gregory (1993) and Maglen (1994). Gregory's analysis of changes in the pattern of employment by earnings levels shows that between 1976 and 1990 Australia lost middle income, non-managerial level, male jobs at an astounding rate. He concluded that the unskilled have become unemployed not only because unskilled jobs are disappearing, but because employees from 'the disappearing middle' are out-competing the unskilled for low pay jobs (Gregory 1993). He noted that the average number of years of education held by the full-year full-time workforce had increased by one year since 1976 yet real wages for non-managerial male workers had not increased. Karmel (1993) and DEET (1991) suggest that the trend in employment has been towards occupations with above average educational requirements. Perhaps skill requirements are rising, but payment for skill is declining (for further discussion see Burke et al 1994, pp 22-23).

In several papers, Maglen has assessed Australian and overseas evidence on the economic returns to education (e.g. Maglen 1993 and Maglen et al 1994). In regard to the size and pattern of growth in VET, Maglen has interpreted recent changes in the work force in the context of the changing international economic environment based on Reich's study (Reich 1991). This study reclassifies jobs to reflect employment patterns that are emerging in the global economy (routine production workers, in-person service workers; and symbolic analysts). Changes in Australian occupations since 1986 are consistent with those expected. Employment is growing fastest (especially in full-time employment) for symbolic analysts, slowest for routine production workers.

Maglen sees VET as having a positive role in preparing a limited number of students in basic trades and in fundamental business and computing skills. Many of these jobs will be less routine and will call for greater skill levels, broader skill bands and greater adaptability (see Thurow 1992, pp 51-55). The most important function of VET is likely to be preparing people for in-person service work. Pre-employment education which stresses key competencies, especially in communicating and inter-personal relationships, together with courses tailored to meet the specific requirements of employers, are likely to grow in importance. VET is also involved in the education and training of symbolic analysts — especially those involved in audio and visual representations — which are expected to continue to grow strongly.

However, we should not exaggerate what the research will yield. The future path of the economy is not readily predictable. The review by Burke et al (1994) emphasised the need for lifelong learning, flexibility in the modes of provision of education and training and responsiveness to emerging needs.

3. Micro Issues and Skills Formation

Employment in the public and private sectors takes place within the framework of the enterprise. It is within enterprises that the demand for skills, expressed as specific jobs for workers, is given effect.

The National Training Board (NTB) defines skill as 'the ability to perform a task in an
organised and coordinated way. Skill may be described as perceptual, motor, manual, intellectual, social, affective, etc. depending on the nature of the task (NTB cited in Deveson 1990, p.90) Danish economists (Lundvall and Johnson 1992; Lundvall 1993) take a broader view of skill. They argue that knowledge is the strategic resource of the modern economy which has on-going innovation at the centre of its activities. The application of new knowledge is the essence of innovation. It is learning which leads to new knowledge and the spread of old knowledge to 'new' persons (see also Carmichael 1993).

The OECD uses the term ‘skills formation’ as shorthand for the multifaceted processes by which people acquire skills, knowledge and attributes which improve performance in a current or future job (OECD 1993). It represents the skills formation process as being ‘shaped by the demand for workplace skills as well as by independent cultural and demographic forces’. However, education and training are not the only paths to skills formation. Mathews (1989) argues that an adequate career structure which recognises skills acquisition and an industrial relations system which encourages career development also influence skills formation. In the OECD area as a whole, new entrants represent only 2-4 per cent of the local labour force in any one year. That is, the majority of the labour force a decade hence are already in paid employment.

International competition and globalisation are being driven increasingly by technological advance and the ability to innovate, i.e. the capacity to respond quickly to market demands for new products and processes. Increased pressure is placed on enterprises to respond quickly and flexibly; and increased value on the knowledge and skills critical to successful innovation at the enterprise level. Indeed, Smith (1993) argues that the competitive position of the enterprise is the most significant factor affecting its demand for training.

To the extent that approaches to skills formation have complemented existing management and work organisation arrangements they have tended to operate in a ‘fordist’ paradigm. Fordism implies a restricted scope for education and training; entry level training for a narrow range of occupations and low levels of worker training, usually limited to acquiring specific skills, say to operate new equipment. There is a widespread view that fordism is too rigid, inhibits the enterprise’s capacity to respond flexibly and quickly to changing demands and places insufficient value on the knowledge and skills critical to successful innovation. It would seem that only through new forms of corporate management and work organisation, which allow for greater flexibility in production, more flexible work methods and a greater degree of responsiveness to the market will enterprises be able to foster innovation and remain competitive. There has also been a growing realisation that one element cannot be changed without causing changes in the others (ACTU/TDC 1987; Sweet 1988, Hayton 1988; Smith 1993). These post-fordist forms are facilitated by the new information, computer and telecommunications technologies which allow for greater devolution of control to the workforce (in services and in manufacturing).

OECD (1992) case studies suggest that skill structures in enterprises are changing in response to three (interrelated) factors: changes in work organisation; changes in occupational structures resulting largely from technological change but also resulting from the move to smaller production units; and the accelerating pace of change. Changes in the occupational structure resulting from technological change, particularly the introduction of new information technologies, have tended to reduce the employment of less skilled workers, both in manufacturing and white collar areas. The smaller scale units tend to be less hierarchical and more involved in their management structure. The resulting occupational shifts favour a move away from a pyramid-shaped skill structure, with large numbers of unskilled and semi-skilled workers at the base, to ‘something resembling an onion or orange in which a bulge occurs at the middle level of skills’.
Marceau (1989) found that there are very different patterns in the use of skills between small manufacturing enterprises and large companies. Furthermore, within large enterprises there is great variety in perceptions of what skills are needed. Differences between enterprises may reflect differences in competitive strategies.

The effective implementation of change in work organisation and skill structures depends critically on the quality of management. BCA (1993b) found that enterprise performance depended on three key attributes: the quality of its management system; its application of resources, and its leadership. The study team found that sustained leadership was essential if innovation was to be sustained. The Australian Manufacturing Council’s study, Emerging Exporters Australia’s High Value-Added Manufacturing Exporters also identified leadership as critical (AMC 1993). Management training poses a particular difficulty for smaller enterprises, which is where employment growth is occurring (in Australia and across the OECD area). We concluded that it is important not to overlook the VET challenges for improving management skills.

Especially from the late 1980s (e.g. Dawkins and Holding 1987) national and state governments have implemented a series of initiatives in relation to vocational education and training. These initiatives have become known as the ‘training reform agenda’ and include moves towards competency-based training (CBT) and the recognition of competency. The training reform agenda is so wide ranging in scope and so recent that little useful research is available yet on its costs and benefits. Some of the (largely critical) comments on the agenda are outlined in Burke et al (1994, pp 37-39 and pp.69-73).

4. Equity and VET

Equity is important in its own right. And economic progress may be enhanced by a more equitable distribution, for the skill levels of the lowest grades of workers require substantial enhancement to meet the needs of an internationally competitive economy (Thurow 1992). Of the many groups recognised as disadvantaged, the review by Burke et al (1994, pp 41-52) particularly considers the disadvantages suffered by the long term unemployed, some groups of women and some migrants. These disadvantaged groups have lower levels of (and more restricted) participation in education and training programs, and in the primary workforce.

Of course, education and training alone will not remedy inequalities if they arise from broader social and economic factors affecting opportunities in society (e.g. high levels of unemployment), but it should be noted that TAFE and the Adult and Community Education sector (ACE) have good records relative to higher education in catering for less advantaged groups.

The development of the Training Reform agenda, the spread of competency-based forms of training and assessment, economic restructuring and industrial relations reforms centred on enterprise bargaining have contributed to a substantial and ongoing reform of work, education and training. However, the impact of these reforms on disadvantaged groups and for the achievement of equity objectives has not yet been comprehensively researched. Lack of access to workplace training may be a particular problem for “underemployed” or part-time workers.

Women: Some of the problems predate the changes which have recently affected women’s employment, such as structural change and the economic recession. Others are new. The review by Burke et al (1994) suggests that the focus of education and training programs for women should be in three areas. First, to broaden women’s career options by giving them the skills and opportunities to enter other fields. Second, to enable women to gain the technical skills which are required in many of the new positions and to ensure jobs are available for women at the end of vocational courses in non-traditional areas. Third, to ensure that women...
in employment are given the opportunity for accredited training (and to provide re-training for displaced women workers).

There have been some advances, such as increased participation in education and training and some broadening in the fields of study, but many of the problems persist. Of particular concern is the lack of appropriate training opportunities, especially for older and part-time workers, the low number of girls taking up a trade; the narrowness of girls' subject choices in post-compulsory schooling; and the low number of women undertaking higher degrees. Psychological barriers may include the attitude of employees, possibly the inherent conservatism of the culture in Australian organisations; the attitude of unions; and the self-perceptions of women. Functional barriers could include: lack of paid training leave, the timing of training; child-care provisions, transport; and language and literacy skills (Kesig 1991)

Ainley and McKenzie (1991) prepared a paper for the Finn report on the participation of girls and women in education and training. See also (DEET 1993a and DEET 1993b) on women's recent employment and education experience.

The ACE sector provides both general and vocational education and the vast majority of its students are women. The informality of the sector, its accessibility, the flexibility of its fees and the provision of childcare increase its appeal to women (ACFE/STB 1993). Barnett (1994) argues that, in future, the ACE sector will play an increasingly significant role in supplying vocationally-oriented courses.

Migrants are a diverse group with special needs according to age, gender, life experiences, English language proficiency, educational backgrounds, socio-economic status in their location of origin, length of residence in Australia and cultural mores (Mageean 1990; Castles 1987; Wooden 1990; Lampugnani and Mansell 1984, Flatau and Hemmings 1991). Their education and training needs reflect these factors. So far, there is little comprehensive research on how these special needs can be accommodated within the new VET system. Much still remains unclear about the effects of structural changes on migrant workers and their response to the available training and re-training programs. The appropriateness of CBT for their needs and the implications of the costs they might incur in an open training market also remain to be explored. However, the available research appears to suggest that education and training should focus on English language training (Fenley 1992); aim to provide technical skills; increase awareness of employment opportunities and the cultural literacy required to negotiate life changes within the dominant Anglo-Australian culture (Freeland 1991); and provide programs which will enable high level qualifications gained overseas to be built on in ways relevant to the Australian labour market.

Long-term unemployed (LTU) have been unemployed for one year or more. Their numbers have risen dramatically since the 1970s, from 2% of the total unemployed to 37% in August 1993 (Committee on Employment Opportunities (CEO) 1993a; 1993b). The LTU tend to be disadvantaged by limited education, skills and experience and lack of contact with the social network through which jobs are filled. Long-term unemployment also has economic and efficiency costs relating to the persistence of benefit payments, tax revenue foregone and adverse effects on the functioning of the economy.

Education and training opportunities for the LTU have been provided mainly through a variety of labour market programs (LMPs), many of which combine training and work experience. The results of evaluations suggest that the programs reduce the total numbers of LTU, but still one-fifth of the LTU in 1992-93 were assisted into jobs through programs, while LTU numbers continued to grow (CEO 1993a). The majority of the LTU still received no LMP assistance in
1992-93, although their share of places in LMPs rose from 30% in 1990-91 to 62% by 1992-93 Australian expenditure on LMPs as a percentage of GDP remained below the OECD average CEO (1993a) argued for a major expansion of programs, improvement in their targeting and quality, and more specific programs to meet the needs of particular groups (such as those with low language and literacy skills).

The ACFE sector provides training for the LTU through the provision of some LMPs; and also through its general adult education, access and vocational education and training courses (see ACFE 1992) Recent moves to revise and expand the data collection (COTTIS 1993) and the release of a draft national policy on adult and community education (AEC/MOVEET 1993) may lead to the provision of more comprehensive information and greater recognition of the sector's role

5. The Internal Efficiency of VET

About 0.5% of GDP is spent by governments on TAFE. Burke (1992a) estimated that over the twenty years to 1988-89, expenditure on TAFE as a proportion of total government education expenditure doubled (from 5% to 11%), although most of this increase occurred in the period up to the early 1980s. There are still substantial gaps in information about costs and outcomes in TAFE, and the comparability across States of data on TAFE expenditure has been quite poor (Burke 1992a) However, recently there has been an important improvement at the aggregate level in establishing a national standard for finance statistics (Task Force 1992).

To date there has been even less research on the costs and outcomes of non-TAFE means of providing vocational training, such as private sector training firms and on-the-job training. ABS data (ABS 6353.0; see also Burke 1992) estimate expenditure on training by employers at over $3,700m in 1990. This represents nearly 1% of GDP (0.5% excluding wages and salaries paid during off-the-job training) it includes expenditure on in-house training and external training, but does not include the cost of on-the-job informal training.

A search of the recent research literature identified only a small number of studies that examined cost issues in the provision of TAFE, apart from the discussion of training costs by Deveson (1990) A number of studies have examined student finance in TAFE (e.g Powles 1990) Few studies have examined costs in terms of planning at either the sectoral or institutional level (though see Butterworth 1992). However, the implementation of AVETMISS should improve unit expenditure data in the next few years. Still the most comprehensive study of costs in technical education is by Selby Smith (1975), who prepared estimates for certificate courses, trade, technician and diploma courses. Butterworth (1985) analysed the relationship between enrolment size and institutional operating costs in the NSW TAFE sector. He concluded that economies of size did not appear to exist. One of the few cost studies relating to training for a particular field is by Hayton (1988) who examined the capital costs associated with training in the printing industry.

Pyle (1986) provided a useful conceptual framework for examining productivity and equity issues in TAFE. However, the study was able to identify little empirical research on the destinations of TAFE students or the relationship between post-TAFE labour market experiences and the nature and duration of the training students had received. A recent exception is the study by Morrison and Davenport (1992) on the post-course destinations of students from a TAFE college in Perth.

There is a dearth of information on attrition and achievement in TAFE courses, although some institutions regularly collect student attrition and course completion data (e.g. Canberra Institute 1993a) and some specific analyses have been published (Brown et al 1988, Duball and Baker.
A major problem has been a lack of consistency within and between TAFE colleges in recording student withdrawals and course completion rates (Bath 1987, Holmesglen College of TAFE 1992). The Australian Vocational Education and Training Management Information and Statistical Standard (AVETMISS), endorsed by Ministers in 1993, requires the collection of outcomes data. The Australian Committee on Vocational Education and Training Statistics (ACVETS) has developed a set of performance measures.

Some States and Territories have been collecting destination data for TAFE graduates (e.g. ACT and Queensland—see Canberra Institute 1993b). In 1993 the NCVER and NATMISS released the first annual survey of students exiting from TAFE (Dawe 1993), which considered a range of issues concerned with courses of study, client satisfaction and employment. The annual studies should prove to be a valuable source of information on outcomes.

There has been only limited work on rates of return to participation in TAFE. Blandy et al. (1979) suggested that "lower-level post-secondary courses are probably a better investment at present than degree or diploma courses" (p. 142). Hatton and Chapman (1989) (using 1973 data) estimated that the internal rate of return on a trade qualification was slightly negative, on an apprenticeship about 6%, and a bachelor's degree 8%. They concluded that "the rate of return on apprenticeships and trade training was probably no higher than other forms of post-school training and may have been somewhat lower" (p. 149). A more recent study by Sturman and Long (1990), based on 1986 ACER data, suggested that (at age 25) the returns from apprenticeships exceed those from higher education. However, returns to non-apprenticeship TAFE courses, many of which are undertaken full-time, appeared to be relatively low. Preliminary analyses of the same cohort of young people three years later suggested that the relative advantage of undertaking an apprenticeship had narrowed somewhat. The review by Burke et al. (1994) concluded that policy making on resource allocation and fee levels for TAFE, and the viability and equity of deferred payment schemes such as HECS, require a stronger research base than is currently available.

6. Financing Mechanisms and Development of a Training Market

The mechanisms by which VET is financed affect the form of organisation and control, efficiency of provision, the type of VET provided, who bears the costs, total expenditure, and the distribution of VET among different sectors of the population. The states remain the major source of funds for TAFE. In 1991-92 the Commonwealth supplied 15% of recurrent and operating revenues, the States 72% and fees and other revenue 13% (student fees and charges 4%, fee for service charges 5% and other revenue nearly 5%). The Commonwealth provided the major share (63%) of capital funds (Task Force 1992: 43-45). These data exclude employer expenditure on training, except for that small part which is used to pay for courses and services in TAFE.

The higher education contribution scheme (HECS) was introduced in 1989. It requires most university students to contribute around 20% of the average cost of a university place (payment can be deferred). The case for introducing HECS in higher education was the stringency in public funding in a period when a rapid expansion of enrolments was being pursued (and equity, since graduates tend to receive above average earnings). HECS was not the deterrent to enrolment by low income groups that a compulsory up-front fee would have been, and does not have to be paid if earnings remain below the average in the community. However, HECS repayments reduced the private rate of return to higher education. HECS was not introduced into TAFE for a variety of reasons, including the system's diversity and complexity and the generally lower socioeconomic profile of students. HECS has been extended to cover fees for Open Learning and the case for its extension to Associate Diploma and Diploma courses in TAFE has been argued (NBEET 1992, p. 44).
The development of a diverse national training market (NTM) is seen as a way of providing competition for TAFE, stimulating efficiency and increasing private sources of finance in a period of tight public funding (see ANTA 1993). Equity issues must also be considered. In VET, as in other forms of education, there may be a case for arguing there are benefits to society larger than those accruing to the private individual being trained. Such benefits may justify government subsidy to VET and other forms of education. ANTA is encouraging the development of the NTM and governmental endorsement of the Hilmer report (1993) will increase the pressure to develop a training market.

The move to competency-based assessment and nationally recognised certification, will enhance knowledge about the products of VET and provide the possibility of a larger number of buyers and sellers for a ‘homogeneous product’. It should make easier the entry of private providers into the market. On the other hand, national arrangements could become bureaucratic and limit developments in the market. It is not clear that students or industry— or government bodies—are well informed of the longer term costs and benefits of particular forms of VET. Research on alternative forms of delivery of VET was suggested by the review by Burke et al (1994). However, a major reason for stimulating the development of a market is to increase awareness of both the content of VET and employers’ particular needs.

Borland (1990) and Chapman and Stemp (1991) see little role for public sector involvement: "If there is training under-provision in Australia it is the consequence of misguided rules and policies associated with labour market regulation and the removal of these impediments is the appropriate government strategy" (Chapman and Stemp 1992, p.354). Sloan (1993) argued that if there is under-investment in training it is because workers are paid too much during training, creating a disincentive for employers, and workers are paid too little when trained with a resulting high wastage rate out of skilled occupations. A ‘training wage’ is seen as one means of offsetting this problem and a version of it was recommended in Working Nation (Keating 1994).

The experience of government intervention through the Training Guarantee appears a mixed one. Surveys of employers by Collins and Hackmann (1991) and by Peak (1991) indicate an increased awareness of the need for training in industry and a more professional approach to training, but little employer support for the training guarantee and the paperwork it involved. The Australian Taxation Office (1992) suggested that in 1990-91 63% of businesses were spending the same or less than before the scheme was introduced. The Kelty Report Developing Australia (1993) may have been an important influence on the decision to suspend the Training Guarantee levy. It reported that regional employers said the training guarantee had created an administrative burden and was failing to provide the training for which it had been designed.

7. Future Research Priorities

We concluded from our review that the current research does not provide firm guidelines on the appropriate balance of expansion in VET. Particular interpretations of the macro changes can be derived from Gregory (1993) and Maglen (1994). Research is needed to assess the case for particular levels and types of education and training in an economy affected by globalisation. This could include extension of studies in the areas considered by Gregory and Maglen, and analysis of the available longitudinal data sets, which have so far been little used in research. Case studies of particular industries and occupations would be valuable, including studies of the acquisition and use of skills acquired through on-the-job and off-the-job training.

1 Our consideration of research did not include discussion of the organisation of research, which had been reviewed by McGaw et al (1992) and by McDonald et al (1992).
In relation to the more micro level changes concerning skills and skill formation issues and training at the enterprise level, we concluded that there is a need for further research on a range of matters: the nature and extent of the relationships between corporate management arrangements, changes in work organisation, technological innovation and skills formation (and how these changes are affecting skills structures within enterprises); whether the impact on skills structures varies e.g. between industry sectors or the size of enterprises (as suggested by OECD case studies); whether institutional and other factors constrain the skills formation process within enterprises and could be overcome by appropriate policy action, the relative effectiveness *inter alia* of structured training (both on-the-job and off-the-job), learning by doing and training undertaken by workers privately, in various situations, the skills structures of smaller Australian enterprises, especially those identified as emerging exporters, and how this key group is approaching skill formation issues, and research into the ways in which individual enterprises can better organise their training efforts to achieve improved outcomes for productivity and overall enterprise improvement.

The concern for equity in society requires increased access to VET for disadvantaged persons such as: low-paid, low-skilled and casual workers, the long-term unemployed, persons not in the labour force as a result of poor job prospects, recent arrivals of non-English speaking migrants, indigenous Australians, the handicapped and some groups of women. Consideration is also needed of the contribution of VET to citizenship and personal development before judgements can properly be made on how VET resource allocation priorities should be determined. Continuing research and documentation is needed of the forms of provision of VET to less advantaged groups, of the effectiveness of alternatives (including alternative forms of finance) and of the effects of the ways in which VET is financed in the public and private sectors. Other research areas include: how competency based training and assessment will affect disadvantaged groups; how effective are the training programs offered to disadvantaged groups affected by change; how VET can assist the disadvantaged to increase their labour market success in the context of enterprise bargaining; and the contribution which adult and community education can make to VET processes and outcomes for disadvantaged groups.

In relation to the internal efficiency of VET we noted that improved data on aggregate expenditure is gradually becoming available for TAFE and training. However, little is yet known about the comparative costs of provision of various forms of vocational education and training. Although the enrolment and financial data are not yet adequate, there are prospects of better data becoming available through the implementation of AVETMISS. We suggested that studies should be carried out using the improved aggregate data becoming available on VET inputs and outputs, including analysis of the major ABS surveys and the national finance data. However, it seems national or state-level collections are never likely to give cost and outcome information in sufficient detail for analysis of particular programs. Consequently, they will need to be complemented by case studies of particular TAFE and industry courses, and of combinations of school-TAFE-industry training.

Finally, it is clear that the form of finance can affect the extent to which VET is provided in a competitive market and, in turn, what types of VET are provided, who they are provided for, how efficiently they are provided and the degree of industry responsibility for VET. The areas in which market provision of VET should be further developed need consideration, as do the advantages and disadvantages of alternative combinations of public and private financing of VET. The uncertainty of the implications of our review of the macro and micro changes in the economy emphasises the need for a VET system which is flexible and responsive to the needs of students and employers.
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Models of Enterprise Training: A Review

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This paper examines the results of recent case study research into the determinants of training at the enterprise level (Smith et al., 1995) in the light of the various models that have been suggested in the literature on enterprise training since the mid-1980s.

The research involved in-depth case studies of thirty enterprises in Australia. The enterprises were grouped into three industry sectors:

- electronics equipment manufacturing,
- food processing, and
- building and construction.

The research was carried out by a consortium of researchers from Charles Sturt University, the University of Technology, Sydney and Australian Workplace Strategies, a Melbourne-based consulting group.

1. Models of Training in the Enterprise

Since the mid-1980s a number of models have been developed in the literature that attempt to account for the way in which training is carried out at the enterprise level. In general these models have attempted to link training to other factors that operate in the enterprise and have a bearing on training and its effectiveness. This paper will review three of these models and present the findings from the case studies as a commentary on each of them. The three models that will be reviewed are:

- the Ford Model of Skill Formation and the Technoculture,
- the Warwick Model, and
- the National Institute of Economic and Social Research studies.

2. Skill Formation and the Technoculture

Arguably the best known model in Australia is that proposed by Bill Ford to account for the interrelationships between skill formation practices and other aspects of the workplace. His model is largely based on the work of the OECD Centre for Educational Research and Innovation (CERI). In the mid-1980s CERI initiated a project to examine the implications for workers of the introduction of new technologies into the workplace (OECD/CERI 1986, 1988).

Building on CERI's work, Ford proposed the notion of a technoculture (Ford 1989, 1988a, 1988b). The original concept of the technoculture was a national culture that embraced four key elements:

- New technology. The extent to which computised technologies are being utilised by organisations.
- Work organisation. Tayloristic work organisations are dominant in many industrialised countries. This restricts their capacity to change to meet new market conditions.
• Skill formation. Ford's notion is much broader than simply training, which is one mechanism for the formation of skills. Skill formation for Ford embraces all those experiences, planned or not, which enhance skills and contribute to learning.

• Employee relations/participation. Not just industrial relations in the narrow sense used in Australia, but the whole scope of management-worker relationships with a particular emphasis on employee participation.

Ford's approach is both general and prescriptive. In order to meet the challenges of internationalisation, organisations have to become adaptable and able to learn from other cultures. This requires an innovative technoculture which is characterised by selective use of new technologies, flexible (non-Taylorist) work organisations, participative employee relations practices and innovative forms of skill formation. Unfortunately, much of what Ford has to offer in terms of prescription remains at this level of exhortation.

The strength of Ford's model, however, lies in its presentation of training as a process that cannot work in isolation at the enterprise level. If innovations in training are not complemented by changes to technology, work organisation and employee relations practices, then they have little scope for effecting change to organisational performance. Training must work with and through other factors to be successful.

Findings from the Cases

The cases confirm the importance of technological change and innovations in work organisation to the provision of training at the enterprise level. Technological change emerged as a key driver for training in all of the cases. However, the training was usually highly specific and quite routine in nature. It was rarely the form of multiskilling that was envisaged by the CERI researchers. Similarly, work reorganisation was a phenomenon that was only beginning to emerge in most of the cases studied. Some training had been taking place in some of the enterprises to support more team-based approaches to work organisation, but this was still at the early stages and often not clearly linked to specific changes at the shop floor level.

Thus, although the factors identified by Ford emerged as key factors in the cases, they were not as advanced or as closely integrated as he suggests. There was no clear link discernible in the cases between technological change and changes to work organisation. In many cases, technological change had eliminated certain activities at the operational level (such as manual PCB assembly in the case of the electronics industry), but this had not translated into major changes to work organisation for shopfloor employees. Such changes were being driven rather by the introduction of quality assurance systems and the managerial search for more efficient ways of working.

There was little evidence in the cases to support the closely integrated model of technological change, work reorganisation, training and employee relations that Ford postulates. Although there was evidence that the climate of employee relations had become much more harmonious for many of the enterprises studied, the link between ER/IR and training was not a strong one. Apart from the general climate-setting effect of award restructuring, ER/IR issues seemed to have had little impact on the training outcomes in most of the cases.

Thus, while the elements of Ford's model are important to the understanding of the provision of training in the cases, the links between the elements are not as close as the model would suggest. Ford's essential notion that changes in one element had to be accompanied by changes in the others was not borne out by the cases. Changes to technology, work organisation and employee relations often took place only in a loosely associated way or, in some cases, in isolation from each other. Changes in each...
of the elements tended to have different training implications - thus changes to technology often required only routine, technical training in comparison to changes in work organisation that tended to require training in more generic, behavioural skills. Neither of these training triggers were necessarily affected by the ER/IR climate in the enterprise.

3. Studies by the National Institute for Economic and Social Research

Probably the most quoted studies in the area of skills training and its relationship to the productivity of the enterprise are those conducted by Karin Wagner and her colleagues at the UK-based National Institute for Economic and Social Research (NIESR) during the mid-1980s (Daly, Hitchens and Wagner 1985, Steedman and Wagner 1987, Steedman and Wagner 1989, Praes, Jarvis and Wagner 1991)

Wagner and her colleagues investigated the reasons for the enormous perceived productivity gaps between manufacturing companies in Britain and Germany from the point of view of skills differences between the British and German workforces. Over a period of six years the NIESR team made a series of matched plant comparisons in the metal working, furniture making and clothing industries in the two countries, followed later by a similar study of the hotel industry. The matching process was scrupulously arranged by the NIESR team to ensure that as little bias as possible crept into the research at the sampling stage, where possible not only factories but products within factories were matched to give as true a reading as possible.

Generally, the conclusions of the studies showed a similar picture emerging in each of the sectors examined:

- German firms enjoyed productivity advantages of between 100 and 230 per cent over their matched rivals in the UK.

- German firms made more extensive use of computer-aided systems in manufacture, materials handling and design (and in hotel reservation systems).

- There were fewer maintenance and breakdown problems in the German factories.

- Managers with intermediate level skills (foremen in the UK, Meister in Germany) enjoyed far more autonomy in planning and decision making in Germany than their British counterparts.

- German firms had a much clearer strategic direction than their British rivals. In some cases, such as clothing, this meant that the German companies had abandoned some markets altogether to pursue high margin, niche markets, leaving British firms to compete at the low cost end of the market.

- At all levels, from shop floor operator to general manager, German workers were more highly qualified than British workers. German shopfloor operators usually possessed 2-3 year formal qualifications in the industry. German craftsmen had been given more specialised training than British tradespersons, German Meister had undergone significantly more technical and managerial training than British foremen, and at middle/senior manager level undergraduate and even higher degrees were common among German managers, rare in British managerial ranks.

The NIESR researchers concluded that higher levels of skill, as represented by the qualifications of the German workforce, were the determining factor in the success of the German sample firms in all cases. According to Wagner, skills accounted for all the observable differences. The skills of the shopfloor workers made German workers more adaptable to change, particularly the introduction of new technology. The superior performance of the German technology strategies was a result of the
diagnostic skills of German craftsmen and Meister. The smooth running of the production systems in the German factories was a result of the superior education of the Meister who had the ability to carry out many management functions on the shopfloor. The technical skills of the Meister also contributed to the smooth operation of the production system. Finally, the qualifications of German managers enabled them to take a broader, strategic approach to business in contrast to their British counterparts and to direct their businesses into profitable markets.

Findings from the Cases

The research did not set out to test the validity of the conclusions of the NIESR team. No matched comparisons were made between any of the cases and no attempt was made to link the productivity of the case enterprises to the levels of skill present in the workforce. However, the cases did present an opportunity to investigate the role of training in the performance of the enterprises from the point of view of managers and others.

Generally, all the case enterprises had experienced dramatic increases in productivity during the early 1990s. Much of this increase was, of course, the result of the severe downsizing that had occurred in most of the enterprises studied. This downsizing was now presenting problems for the enterprises in terms of release of employees for training. Other factors that had influenced productivity growth during this period had been technological change in the form of automation and, for some, the experience of high growth markets, especially export markets.

In some senses, it could be said that the skills of those employees who had not been retrenched had allowed enterprises to carry on or even increase production despite the loss of skilled employees. However, few managers attributed the performance gains of the enterprises to the skills of the surviving employees. Improvements in productivity were ascribed to the better use of existing skills, i.e., better shopfloor management. Improvements in quality were ascribed to the introduction of better quality control systems and changes in "attitudes" rather than skills per se.

However, many managers felt that the next step in performance improvement rested more clearly on upgrading the skills of employees. There appeared to be a general belief, expressed most clearly in the electronics enterprises, that the point had been reached where further improvements in quality and productivity would demand changes in the way work was organised and that this would require more skills from employees at every level. Often this view about the future role of skills and training in the enterprise encompassed the role of managers who, in some cases, were regarded as lacking the new business skills that would be necessary. However, in general, these upskilling strategies had yet to be implemented and the belief in the importance of training to performance improvements in the enterprise was not underpinned by any rational assessment of the returns to the training that had been carried out to date.

4. The Warwick Model of Training in the Enterprise

The Centre for Corporate Strategy and Change at the University of Warwick has carried out a major study of the role of training at the enterprise level. Building on the perception that the lack of training in British organisations was contributing to their declining international competitiveness (Sparrow and Pettigrew, 1985), the Warwick researchers examined a stratified sample of British enterprises to establish the role of training and its relationship to corporate strategy. They identified two sets of factors that affect the provision of training in their sample (Hendry and Pettigrew 1989).

- factors that set training in progress (triggers), and
- factors that establish training within the enterprise (stabilisers)
The forces that trigger training provision are clearly linked to the strategy making process. Organisations come under competitive pressure and make changes to their products and services. These changes highlight a skills gap in the workforce and training becomes part of the corporate strategy. However, this process is not enough to secure the long term commitment of the organisation to training. A skills gap can be remedied in a number of ways, including by recruitment on the labour market (a non-training solution). Training is only stabilised by a combination of factors inside and outside the organisation. External factors for stabilisation include:

- the availability of skills on the labour market,
- external support for training (grants, etc.), and
- legislative requirements (government levies, etc.)

Within the organisation, factors include:

- the existence of a training "champion",
- senior management commitment,
- training infrastructure within the organisation,
- budgetary constraints, and
- trade unions acting as a watchdog on training provision.

The Warwick researchers argue that most of these factors need to be present for the organisation to display a long term commitment to training. They argue that the conditions for greater organisational training provision have been created by the decentralisation that characterised the restructuring of British enterprises in the 1980s. Decentralisation has been accompanied by the creation of corporate internal labour markets in large business groups which have shifted the focus of personnel departments from industrial relations to training and development (Hendry 1990).

The Warwick research has come nearest to developing a model of training within the enterprise. It shows the links between training and strategy and the conditions which must exist in the organisation to establish training.

**Findings from the Cases**

The Warwick model, with its focus on the process of training at the level of the enterprise, informed this research more than any other. Many of the factors identified in the model were built into the case study protocol, such as the strategy of the enterprise, the existence of internal labour market arrangements and so on.

In general, the cases confirmed the overall features of the model, particularly the distinction between factors that trigger training and factors that stabilise training. However, the diversity of the cases demonstrated that the model is too simplistic and universalistic in its explanation of the processes of training in the enterprise.

The overarching importance of competitive pressure was confirmed by the cases. Competitive pressure impacts at all levels, not simply at the level of the enterprise. The economic and industry context in which the enterprises operate is also affected by the role of competition. It is overwhelmingly the pressure of competition that focuses the attention of enterprise managers on the importance of training in securing the future position of the company.

However, competitive pressure does not lead to the straightforward formulation of a strategic response. Although some of the case enterprises had gone through a process of strategy making, many others...
were responding to their competitive environments in a less than strategic fashion. For many, strategy was simply a general sense of direction for the enterprise, for others, there was little discernible direction apart from continuing what the enterprise had been doing. Moreover, within this discontinuous range of enterprise responses to competitive pressure, training did not emerge as a strategic factor.

In general, enterprise responses, whether strategic or not, did not focus on the specific skills gaps described in the Warwick model. In many cases the responses of the enterprises were too general to identify specific gaps that could be addressed by training. As an example, a recognition that the enterprise should target markets in Asia more effectively is too general and diffuse a strategy to imply the specific training needs that such a strategy would need to address to be successful. However, it may enable managers to recognize that acquiring new sets of skills will be an important ingredient in success. Hence a commitment to training was often the result of such general strategic direction setting exercises. The specific nature of the training that would have to be carried out did not emerge until operational decisions were made about specific products and processes. Thus training emerges as an operational rather than strategic issue.

An important element of the Warwick model is the role of external factors, in particular the state of the external labour market, government intervention and the availability of funding from outside sources for training programs. In general the cases did not confirm the importance of the external factors to training decisions at the enterprise level. In particular, government intervention was not viewed as a critical determining factor. Rather government policies tended to create a context in which enterprises were encouraged to invest in training rather than determining specific training outcomes. In this sense, government policies did not act on the factors that determined the training that particular enterprises carried out - these factors tended to be internal to the enterprise - but rather influenced enterprises at the structural level affecting the way in which training was implemented. External funding seemed to have little influence on the training that was carried out. In some cases, funding from the Best Practice Demonstration program has helped enterprises to implement their training programs, but this did not appear to have influenced the decision to train in the first place.

Some of the internal factors identified by the Warwick team were confirmed by the cases, others were not. The importance of senior management commitment to the decision to train was a key factor in all the cases. Decisions to invest in training were taken at the senior management level. However, the role of middle managers in the implementation of the decisions was also critical to the success of training in the enterprise. This factor is not identified in the Warwick model. Budgetary constraints were also an important factor in the implementation of training. A recurring theme in the cases was the difficulty of releasing employees for training and this usually related to budgetary constraints in the form of staffing levels.

However, other factors that the Warwick team identified did not appear to be so important in these cases. In particular the role of the "training champion" was not one which was easily identified in the cases. Although there were clear examples of managers in some of the cases who were particularly committed to training, they often did not exert the singular influence on the training process that the Warwick studies imply. Sometimes, if the champion was in a position of considerable power within the enterprise, they would influence the process by creating a climate in which training was regarded favourably by other managers. However, the direct influence of such managers was usually not felt at the operational level where many of the key decisions concerning training are made.

The "watchdog" role of the trade unions described in the Warwick research also did not appear so clearly in these Australian cases. Union involvement in decisions to train was usually through training committees where these had been established. In such cases union delegates could have significant
influence over the training that was offered. But this situation was unusual and in most of the cases unions had very little influence over training decisions in the enterprise.

Thus, while the general thrust of the Warwick model is confirmed by the cases, its explanatory power is limited. In particular, the model fails to come to grips with the diversity of training outcomes that is a central feature of the findings of this research. As a result, the model lacks the sophistication to adequately distinguish between the type of factors that are operating at the enterprise level on training decisions and the way in which they interact to produce the highly differentiated outcomes observed in the cases.

5. Conclusion

In broad terms, the three models reviewed in this paper highlight the importance of a number of factors to the decision by enterprises to invest in training. These include corporate strategy, work organisation, industrial relations climate, the level of technological innovation and human resources policies. The research has confirmed that all of these factors do indeed play a significant role in decision making about training at the enterprise level. However, the links between these factors and training outcomes are not as direct or as clear cut as the various models suggest.

Other variables play a crucial mediating role. These include such things as the impact of deregulation in the industry and the training arrangements that are present at the industry level. At the enterprise level the role of middle managers is critical for the success of training, as is the impact of organisational culture. In particular, training emerges from the case studies as an overwhelmingly operational rather than strategic issue.

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1. Introduction

The development and implementation of labour market policy could hardly be described as one of the major successes of Australian public policy. In general the development of appropriate policy has achieved most attention during periods of crisis; that is, periods of acute shortage of skilled labour or of prolonged and unacceptably high levels of unemployment. Over the last decade, the issue of skill formation has achieved sustained attention in the context of the federal Government's Training Reform Agenda. Only recently has the focus began to shift to the long term unemployed through the implementation of the Working Nation programs.

Government initiatives undertaken under the rubric of the Training Reform Agenda have included:

- developing industry competency standards as a means of increasing the relevance of training to industry;
- improving skills recognition by refocusing from time served to the outcomes of training. A related initiative has been to improve the recognition of skills and competencies gained, regardless of whether gained in the context of a training program or the type of program involved,
- national portability of skills and qualifications,
- enhanced access to training for disadvantaged groups,
- greater competition between TAFE and commercial training providers (Committee on Employment Opportunities 1993, p.76), and
- requiring all but the smallest enterprises to make a minimal contribution to skill formation internally or externally to that enterprise, the Training Guarantee (Dawkins 1990, p.2).

As well as being a core element of the Training Reform Agenda, the introduction of the Training Guarantee in 1990 was an atypical response to the problems of labour market policy. It was atypical in at least two senses: it did not involve significant public expenditure, and it was part of a wider approach to address the long term problem of skill shortages. From the outset the Training Guarantee was vigorously opposed by a range of business interests, but apparently their views went unheeded until mid-1994 when the Government was about to implement its next major labour market policy initiative, Working Nation (Keating 1994). In a move widely heralded as preceding the demise of the Training Guarantee, the Government announced that the Training Guarantee would be suspended for two years. Whether abandonment of the Training Guarantee was the price for gaining endorsement of Working Nation by large corporations and national employer associations can only be the subject of speculation.
A thorough evaluation of the Training Guarantee is beyond the scope of this paper. Instead, the reasons for the introduction of this novel program are canvassed and its major features are outlined. This is followed by a consideration of the major criticisms directed at the concept of the Training Guarantee. Rather than rehearsing the litany of arguments advanced by the protagonists in this debate, a more fundamental point is made. Whatever the merits of the concept of the Training Guarantee, it was implemented in a form which ensured it would have only a limited impact on decisions relating to skill formation. This argument is developed by reference to published accounts and data collected by the author over three years. That data includes interviews with national and industry employer associations and union representatives, case studies of enterprise training practice and conduct of focus groups with managers responsible for administration of the Training Guarantee in companies spanning a range of manufacturing and service industries.

2. The Policy Context

The introduction of the Training Guarantee did not occur in isolation. As part of the Training Reform Agenda, it was one of a number of initiatives designed to assist the process of microeconomic reform and raise international competitiveness. The Government's views were encapsulated by the then Minister who championed the Training Guarantee against opposition within the public bureaucracy and outside it:

Along with the broadening of occupational structures, training is the key to having a workforce which is productive, flexible and highly skilled ... a workforce that contributes to Australia's competitive edge. Developing the flexibility and skill level of our workforce is arguably the most important element of the Government's microeconomic reforms because our human resources are our most important resource (Dawkins 1991, p.3).

Specific concerns which the Training Guarantee was intended to address are outlined below:

- generally training provision by employers has been ad hoc and crisis-driven, contributing to skill shortages and low quality training;
- training costs have been unequally shared, with non-training employers obtaining significant cost advantages by poaching from the minority of training organisations. In addition there has been a tendency for the private sector to rely on the public sector to undertake a disproportionate share of training activity;
- among OECD countries Australia has exhibited high levels of labour mobility, with higher earnings more readily achieved through job changing than through skill formation and career progression with a single employer;
- achieving competitive advantage requires the development of a training culture, and, for this to occur, training must become a part of the corporate strategy of organisations; and
- the majority of employers made no investment to meet the challenge posed by the rapid pace of technological change. In the circumstances, imposing an obligation to provide or fund training was seen as the least intrusive, least bureaucratic and most efficient solution (Dawkins 1988; Pollock 1991, pp.2-3).
3. The Training Guarantee

Broadly, the objectives of the Training Guarantee (Administration) Act were: "to increase and improve the quality of the employment related skills of the Australian workforce so that it works more productively, flexibly and safely, thereby increasing the efficiency and international competitiveness of Australian industry" [s3(1)].

Other and more specific objectives of the Act included

- improve the quality of employment related training by encouraging employers to engage in structured training,
- increase the access of low skilled workers, women and disadvantaged groups to training,
- accelerate the change in industry perceptions of the value of employment related training; and
- increase employer expenditure on training by targeting those employers who were not training.

In its first year of operation the Training Guarantee required employers with payrolls in excess of $200,000 to spend 1 percent of payroll on 'structured training' as defined. From 1 July 1992, the minimum required expenditure increased to 1.5 percent of payroll. Employers who failed to meet the minimum expenditure obligation were required to pay the shortfall, the levy, to the Australian Taxation Office. Thus, the Training Guarantee was a requirement to spend a minimum amount on training or pay an equivalent taxation levy. Revenue generated from the levy was to be used to fund training initiatives at state and territory level. In practice little revenue was generated in this way.

For purposes of the legislation, eligible training expenditure was defined broadly so that organisations had freedom in deciding what training or training related activities would be of most importance to their operations (Pollock 1991, p.3). Included within the definition of eligible training were activities such as preparing and reviewing strategic training plans. Eligible training programs had to be 'structured' and have as their principal objective the development, maintenance or improvement of employment related skills, knowledge and competencies. Employment related skills included those skills which could be used in a workplace, result in more productive, more flexible, or safer work or which could be used by someone as an employee or in carrying on a business, occupation, trade or profession.

Not only did employers have wide discretion in deciding what type and form of training was appropriate, the definition of structured training placed few limits on program design and delivery. In order to constitute structured training three pre-conditions had to be met, which involved specification of the skills to be acquired by participants, the means of imparting the skills, and the program outcomes.

A further measure to ensure the quality of programs was a requirement that those engaged in program design be familiar with the subject area and have experience or knowledge of training. Alternatively, the program had to be approved by a person or persons with qualifications or experience in training. For this purpose the Government accredited Registered Industry Training Agents (RITAs), generally drawn from professional or employer associations. As the requirement for knowledge or experience of training was easily satisfied, few employers made use of RITAs.
Consistent with the objective of fostering training and recognising that some organisations may not be equipped to deliver training in conformity with the requirements of the relevant legislation, alternative modes of compliance were provided. Companies could donate to an industry training body such as a TAFE college or to a common training fund. The latter have been used to foster training provision in particular industries and enabled employers to draw on training services on the basis of previous financial contributions. Typically, these funds were established by employer associations.

4. Major Criticisms

Introduction of the Training Guarantee proved controversial, despite the fact that the required expenditure initially was set at 1 percent of wages and salaries and there was an exemption for very small businesses. The effect of this exemption was that 85 percent of employers were not bound by the requirements of the Act. However, 60 percent of the remainder, organisations with payrolls over $200,000 p.a., reported no training expenditure in 1990.

Although many criticisms were directed at the Training Guarantee and few were substantiated, the program remained unpopular until its suspension in mid-1994. Some of the major criticisms are examined below and it is argued that adverse publicity should not be allowed to obscure the positive features of the Training Guarantee. In the final analysis the efficacy of the Training Guarantee was constrained by its restricted coverage of employing organisations, the wide definition of eligible training expenditure and the nominal level of expenditure required from employers.

(i) Compliance Costs

Possibly the major criticism was that the Training Guarantee imposed significant additional administrative requirements and costs on business. One version of this argument appeared in the *Australian Accountant* (Velten 1990, p. 30):

Indeed, a particular concern expressed by many business groups is that although they already spend much more than one per cent of their wages bill on training, they are now obliged to introduce expensive new procedures to detail their training. In many cases, administrative costs associated with the scheme could exceed the [sic] levy itself.

Undoubtedly many firms found the administrative requirements were onerous. However this argument misses the point. First, the real issue is whether the costs and inconvenience associated with the Training Guarantee were offset by the benefits. The objects or benefits sought from the Training Guarantee included encouraging organisations to adopt a more strategic approach to skill formation and bringing about an increased national training effort. These matters are considered below. Second, the extent of compliance costs may have been overstated, with many employer organisations producing information packages to facilitate record keeping and commercial providers developing software packages for tracking and appropriately recording training expenditure.

Arguably, by the second year of operation, the costs and difficulty of compliance had become a minor issue. Certainly the incidence of complaints declined and perhaps only the smallest of organisations experienced continuing difficulties with compliance with record keeping requirements. In this relation it should be noted that the Victorian Employers Chamber of Commerce and Industry estimated that documentation costs amounted to at least $80 million per annum and an Australian Chamber of Commerce and Industry representative stated that small businesses sometimes found it administratively easier to pay the levy, even on an ongoing
basis. These views were not borne out by comments in four focus groups drawn from larger firms across a variety of industries. Further, focus group participants indicated that compliance costs were concentrated in the first year. A similar view was held by representatives of three large accounting firms.

In this research a residual problem (or incidental benefit) arising from the Training Guarantee was that it highlighted deficiencies in the utilisation of information technology in the human resources management practices of some firms. Even very large firms in the financial and manufacturing sectors reported difficulty in identifying and capturing relevant data and incorporating it into planning processes.

(ii) Levels of Training

A common criticism, especially in the context of the recession, was that the Training Guarantee would encourage employers to reduce training to the minimum required level (Pollock 1991, p 5). Survey data are more equivocal on the effect on levels of training, however, with expenditure on formal training increasing by 18 percent to $1.1 billion in the September quarter 1993, compared to the equivalent period in 1990. Seventy-five percent of organisations above the Training Guarantee threshold reported training expenditure in 1993, an increase of 15 percent over the 1990 figure. While organisations in each size group reported increased expenditure on training, average hours declined among large firms [more than 100 employees] from 7.1 to 6.2 hours. Focusing on the 25 percent of employers who reported undertaking training in the survey quarter, two important points are evident. First, among small employers (1-19 employees), average hours of training were 13, compared to medium (20-99 employees) and large employers (more than 100 employees) where the average was six hours. Secondly, organisations below the Training Guarantee threshold reporting training recorded expenditure averaging 5.1 percent of gross wages compared to 3.3 percent for organisations above the threshold (ABS 1994).

Further insight into the effects of the Training Guarantee on training expenditure emerge from interviews with employer organisations, professional associations and accounting firms and the conduct of focus groups. The following are the three principal observations. First, the effect of the Training Guarantee may have been masked by the fact that its introduction coincided with the onset of the most severe post-war recession. In this situation a rational response would have been to attempt to meet the requirements of the Training Guarantee by documenting existing training. Secondly, low labour turnover made it difficult, particularly among smaller firms, to meet training expenditure obligations without donating to a common training fund. Thirdly, among the medium to larger organisations, the most common effect of the Training Guarantee was to necessitate structuring of training that was already being provided.

(iii) Training Culture

While there was some appreciation in the business community that the objects of the Training Guarantee included the development of a training culture, especially among businesses which previously undertook no training (Kamenetzky 1991, p 43), it has been argued that the Government chose the wrong instrument. For example Beresford and Gaite (1994, p 10) stated:

In this respect the training guarantee [sic] legislatively is deficient for it provides no incentives to engage in training, only punishments for not doing so.

Alternatively, it may be argued that the Training Guarantee could not achieve its objectives as it lacked prescriptiveness. Applying this line of reasoning, the broad definition of eligible training expenditure was not conducive to organisations providing quality training or adopting...
the strategic approach envisaged by the Government. While donations to industry training bodies and common training funds were an option, firms with only minimal capabilities were permitted, if not encouraged, to design and deliver structured training consistent with the definition of eligible training expenditure in the Act. In some cases it would have been preferable for firms to be required to contract with or donate to a training body rather than undertake training and training related expenditures internally. In this way organisations could still have tax deducted most of their training expenditure and the appropriateness and quality of training could have been ensured. This would have required a more interventionist approach than the Government was willing to contemplate.

Among the focus groups, three types of positive effects consistent with the emergence of a training culture resulted from the requirement to bring training expenditures into compliance with the Training Guarantee. First, improved recording of training expenditure resulted in enhanced management reporting and increased accountability of individual managers. This benefit was evident both at the level of information systems and in the capacity to require managers and workers to provide detailed documentation of training. Secondly, increased ability to evaluate training was manifest in a variety of ways including, more careful evaluation of training options, more accurate costing of training by reducing the incidence of costs erroneously assigned to other activities, elimination of inappropriate activities, and formalisation of internal training. Thirdly, there appeared to be adoption of a more strategic approach to training and, in some cases, movement toward performance management. In some cases the introduction of the Training Guarantee provided managers with the leverage to initiate training in accordance with perceived business needs and facilitated succession planning and professional development.

(iv) Equity

The Training Guarantee also has been criticised for its failure to ensure that training was extended to disadvantaged groups and, relatedly, that expenditures tended to be concentrated among managers. This problem is evident from Australian Bureau of Statistics data indicating that in 1993 the largest amount of average gross salaries spent on training was directed to management and professional training. This figure of $20 per employee represented a slight increase from the previous survey in 1990. Only two of the eight remaining categories of expenditure (clerical and sales and technical and para-professional) recorded more than $10 per capita. Even among the focus groups composed of managers, there were concerns that the Government's failure to specify which employees were to be trained, meant that, independently of merits, managers tended to gain priority in the allocation of training funds. This problem was more likely to arise in cases where training was undertaken merely to defray Training Guarantee liability, rather than as the consequence of a strategic approach to skill formation.

(v) Quality

The Training Guarantee also has been criticised for placing an emphasis on quantity, ignoring quality and failing to address the issue of competence.

The TG has diverted attention from the competence [sic]. 'Does it qualify for TG' has become the question of the year. Clients have stopped asking how this activity will improve on job performance (Noone 1991, p 19)

Some critics have argued that the capacity for training to meet the requirements of the legislation rather than the real needs of business would lead to 'training for training's sake.' Undoubtedly, the Training Guarantee can be criticised for lack of focus, but interviewees and focus group participants regarded a 'training for training's sake' response as exceptional.
common view was that it would be irrational for employers operating in a competitive market to generate costs without seeking maximum returns.

(vi) Needs of Small Business

As indicated above, the impact of the Training Guarantee on small business was seen as particularly onerous and inappropriate. According to this view small business has neither the need to train nor the capacity to release employees to participate in training. In the circumstances, the Training Guarantee is an additional tax extracted from a narrow profit margin for little benefit (Business Council of Australia 1990, p.31). This view found support insofar as employer association representatives referred to the fact that many small businesses did not require training each year. Nevertheless it remains that an objective of the Training Guarantee was to reduce poaching and to encourage all but the smallest employers to finance or engage in training.

A related criticism was to assert that the Training Guarantee was an inappropriate method for changing the highly focused and piecemeal approach to training typically adopted by small business. While endorsing the practical results-oriented aspects of the typical small business approach to training, Beresford and Gait (1994, p.10) criticised the failure of the Training Guarantee to encourage "personal development of cognitive skills or the ability to use innate intellect and to adopt different attitudes and values". On this view, the key to changing attitudes was to provide incentives that addressed the practical problems faced by businesses. Instead, the effect of the legislation allegedly was to encourage a proliferation of providers, thereby confusing and obscuring the opportunities for small businesses seeking real improvements. While the thrust of this criticism is conceded, it merely reflects the design of the Training Guarantee. Equally, it would be a mistake to view this measure in isolation from the other elements of the Training Reform Agenda.

5. Conclusion

The Training Guarantee was implemented as one element of the national Training Reform Agenda. As such it was complementary to other initiatives such as award restructuring, the development of competency based training and assessment, and the Australian Vocational Certificate. Commonly perceived as a tax, the reality was that employers were required to pay the levy only to the extent that they failed to defray their obligations to undertake eligible training or training related expenditure. This obligation could be met directly or by donation to an appropriate training institution or common training fund.

The objectives of the Training Guarantee were diverse, yet the program itself was designed to be administratively simple and impose as little bureaucratic burden on employers as possible. These objectives included spreading the costs of training more equitably among employers and thereby increasing the volume of training, changing industry perceptions of the value of training, improving the quality of training, and making training opportunities more accessible to disadvantaged groups.

Laudable as these objectives were, the design of the program was not appropriate to the task. What reasonably could be achieved by the Training Guarantee was to induce additional employers to undertake formal training, but there could be no assurances regarding the quality of training. Among employers with adequate resources the requirement to record training expenditures facilitated the development of systems to better monitor and to develop a strategic approach to training expenditures. The administrative flexibility of the program, however, ensured that quantity and quality effects were possible rather than inevitable outcomes of its introduction.

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Decomposition of Educational Expenditure in Australia: Government Schools

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Abstract

Changes in nominal expenditures are decomposed into price changes and real changes in the quantity of goods and services. Real changes in the quantity of goods and services are decomposed into changes in quantity per student and changes in numbers of students. Changes in the number of students are decomposed into changes in the relevant population and changes in participation by that population. Then the main findings of the analysis are discussed.

Introduction

This paper analyses changes in public expenditure on education in the period from 1973-74 and provides projections to 2001. The decomposition method is used

- past changes and projected changes in expenditures are decomposed into real changes in the quantity of goods and services and price changes,
- real changes in the quantity of goods and services are decomposed into changes in quantity per student or changes in numbers of students, and
- changes in the number of students are decomposed into changes in the relevant population or changes in participation in education by that population.

The model is outlined in section 1 and discussed in section 2. Section 3 deals with price indexes and data and section 4 with limitations of this form of analysis. Section 5 presents an application of the model to recurrent expenditures on government primary and secondary schools. Section 6 briefly compares the growth in expenditure on government schools with growth in the GDP.

Of the total of nearly 3,100,000 students attending primary and secondary schools in Australia in 1992 about 2,230,000 attended government schools. Recurrent expenditure on government schools was $9.2 billion in 1991-92 or approximately 2.3 per cent of GDP. Total public outlay on education was estimated at a little under 5 per cent of GDP in 1991-92.

The estimates in this paper are a revision and updating of part of the analysis presented in Burke (1992), where recurrent expenditures were decomposed for government schools from 1973-74 to 1999-2000, non-government schools from 1974 to 2000, TAFE from 1980 to 2001, higher education from 1975 to 2001, and student benefits from 1968-69 to 2000-01.
1. **Decomposition Model**

Equations (1) and (2) provide a framework for the presentation of the data.

\[
\begin{align*}
\text{EXP/GDP} & = \frac{(\text{EXP/P})/(\text{GDP/PGDP}) \cdot \text{P/PGDP}}{} \\
\text{EXP} & = \text{P} \cdot \text{POPRA} \cdot \frac{\text{TOTSTUD/POPRA} \cdot (\text{EXP/P})/\text{TOTSTUD}}{}
\end{align*}
\]  

where

- \(\text{EXP}\) is nominal expenditure on education or training at current prices
- \(\text{GDP}\) is the current price value of the GDP
- \(\text{P}\) is a price deflator for education or training
- \(\text{PGDP}\) is the price deflator for the GDP
- \(\text{POPRA}\) is the population in the relevant age groups
- \(\text{TOTSTUD}\) is the total number of students in primary and secondary schools

Thus \(\text{EXP/P}\) is the real or constant price value of outlay on education or training, while \(\text{GDP/PGDP}\) is the constant price estimate of GDP. \(\text{POPRA}\), the population in the relevant age groups, is a measure of demographic influences on the number of students \(\text{TOTSTUD/POPRA}\), the number of students divided by the population of relevant age, is the participation rate. \(\text{(EXP/P)}/\text{TOTSTUD}\), real expenditure divided by the number of students, is the average real expenditure per student.

Equation (1) means that outlay on education as a proportion of GDP equals real outlay divided by real GDP multiplied by the ratio of the price deflators.

Equation (2) means that nominal expenditure equals the price deflator multiplied by the participation rate applied to the relevant population multiplied by real expenditure per student

Equation (1) can be rearranged as

\[
\begin{align*}
\text{EXP/P} & = \frac{\text{PGDP/P} \cdot \text{EXP/PGDP}}{}
\end{align*}
\]  

Equation (2) can be rearranged into two equations.

\[
\begin{align*}
\text{EXP/P} & = \frac{(\text{EXP/P})/\text{LOAD} \cdot \text{LOAD/GOVSTUD} \cdot \text{GOVSTUD}}{} \\
\text{GOVSTUD} & = \frac{\text{POP} \cdot \text{POPRA/POP} \cdot \text{TOTSTUD/POPRA} \cdot \text{GOVSTUD/TOTSTUD}}{}
\end{align*}
\]  

where

- \(\text{LOAD}\) is the weighted sum of students in primary, junior secondary and senior secondary (weighted by expenditure per student at each level in 1989-90);
- \(\text{GOVSTUD}\) is the number of students in government schools;
- \(\text{POP}\) is the total population; and
- \(\text{TOTSTUD}\) is taken to mean the total of students in government and non-government schools.
POPRA/POP is therefore the proportion of the total population that is of school age and GOVSTUD/TOTSTUD is the proportion of total school students which is attending government schools.

Equation (3) is the basis for columns 1, 2 and 3 of Table 1. Equation (4) is the basis of columns 1, 4, 5, and 6 in Table 1. Equation (5) provides the basis for columns 6, 7, 8, 9, and 10. Note that real outlay could be decomposed further into real teacher costs (measured by teacher/pupil ratios) and non-teacher costs (e.g. Karmel 1967). Teacher costs could be decomposed into quantity and quality changes (such as changes in qualifications and seniority) if data were available.

2. Alternative Models

Saunders (1987), in essence, analyses social security expenditures from 1959-60 using equation (2) He decomposes changes in nominal outlays into those due to price increases, demographic changes, participation (coverage) and average real benefit per participant. Saunders is the main author of other studies that relate government outlays to GDP, but he is not concerned with that comparison in his 1987 study. However, such matters — as indicated in Equation (1) — are of concern in this paper and will be taken up, as well as analysis of the type undertaken by Saunders.

EPAC (1986) considered aggregate expenditure on education in total for the period 1962-63 to 1984-85. 'No attempt has been made to disaggregate according to level of education' (EPAC 1986, p. 14). EPAC decomposed changes in education's share of GDP into that due to the demographic factor, the coverage factor and what it called the cost ratio. The cost ratio was further decomposed into a real cost ratio and a relative price effect. The overall relationships and set of equations in EPAC (1986 pp 21-22) are compatible with those outlined here. However, the grouping and labelling of particular terms as 'demographic' and 'real cost ratio' do not appear as useful as the arrangement in Saunders (1987) or here. Firstly, the real cost ratio in the EPAC paper is the average real benefit per student divided by real GDP per head of total population. Changes in that particular indicator can therefore be due to changes in real benefit per student or to changes in GDP or to changes in population. Real benefit per student is not shown separately. Secondly, the inclusion of the population term in the real cost ratio means that it does not occur in the demographic factor, which is then only a measure of the proportion of the population in the relevant age groups, but not of the size of the population.

The Department of Finance (1988) provided another variant on the decomposition method in its analysis of a range of Commonwealth (not State/Territory) outlays for the period 1972-73 to 1991-92. It carried out analysis of 'real outlays' on education, which can be represented here as nominal expenditure (EXP) divided by the deflator of the non-farm GDP. The choice of non-farm GDP deflator rather than GDP deflator does not affect the issue under consideration here. The differences in the two deflators are very small as far as the analysis in this paper is concerned.

Changes in 'real outlays' are decomposed into a relative price effect, demographic, coverage, and average real benefits — the last three as in equation (2) above. The Department of Finance's model is equivalent to equation (2) with each side of the equation divided by the (non-farm) GDP deflator. The resulting 'real outlays' (EXP/P GDP) do not measure change in the quantity of goods and services in education. Rather, they measure the real (non-farm) GDP foregone as a result of the expenditure on education. However, it is worth repeating that the last three terms on the right hand side of the equation remain unchanged. The measure of benefits per student has as its numerator EXP/P, as in equation (2).
It seems more useful here to define real expenditure as EXP/P as in equation (1) rather than as EXP/PGDP. Quantity changes in education are measured by deflating education outlay by its own price index. The relative price effect can still be reported in the analysis which compares the outlay with GDP, as in equation (1) and (3).

3. Indexes and Data

Saunders (1987) used the Consumer Price Index (CPI) in deflating a wide range of monetary benefits to social security recipients. The Department of Finance (1988) used it to deflate outlays on student assistance. But the CPI does not adequately reflect cost changes in government consumption expenditures in education. The Federal Department of Employment, Education and Training (DEET) has maintained cost indexes for the major education sectors, for wages and salaries, for non-labour recurrent expenditure and for capital expenditure. DEET indexes recently have been based on ABS education deflators prepared for the constant price estimates in the National Accounts. ABS has now abandoned the estimation of separate deflators for education consumption expenditure, which will create problems for future analysis of the sort in this paper.

One matter for further consideration is the weights in the indexes. The greater the level of aggregation the more the choice of weights of the components affects the results. In general, the education price indexes used in the paper are those with the most recent weights. The effect of alternative weighting needs further investigation.

Another issue, particularly in the late 1970s, was incremental creep. This was the increase in salaries paid to teachers and lecturers as a result of movement up salary scales, as distinct from increases due to changes in salary award rates. The cost indexes measure changes in award rates. Weights are changed in the indexes in periodic revisions, but this only permits them to represent better the changes in award rates. It might be argued that, given the purpose of the indexes, to adjust government outlays to cover cost increases, they rightly do not account for creep. On this argument it is a matter for educational institutions to adjust their staffing policies to handle the problem. However, for the purpose of measuring real goods and services per student there is a case for a measure of price changes that captures the effect of creep - unless one argues that the movement up the salary scale accurately measures a quality improvement in the staff.

In its publication *Expenditure on Education Australia (5510 0)* the Australian Bureau of Statistics (ABS) has published estimates of public consumption expenditure on government schools up to 1989-90. Alternative more detailed estimates up to 1991-92 are presented in Australian Education Council (AEC), *Summary of Finance Statistics from the National Schools Statistics Collection*. The AEC compiles estimates of expenditures by State and Territory governments on government schools (including expenditure of grants from the Commonwealth). Detail on the scope of the AEC estimates is given in AEC (1992, pages 31 and 35). It is the AEC estimates excluding expenditures on buildings and grounds that are used in this paper.

4. Limitations

The analysis of expenditures using the decomposition approach as discussed above will be some help in explaining why the changes in expenditures have occurred. For example, it will identify how much of the changes in outlay can be associated with changes in prices or population or participation. But the technique of decomposition will not explain changes in policies or programs or the relative expansion of public or private provision. A different level of analysis will be required for such explanations. It may involve consideration of separate elements such as teachers' wages, or the impact of changes in the state of the economy on educational or training
Table 1: Decomposition of Recurrent Expenditure on Government Schools 1973-74 to 2001-02: Indexes, base 1984-85 = 1.00

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Sources: See Table 2
Notes: * Total enrolments in government schools in 1984-85 were 2,246,000. Projections of enrolments to 2002 are based on constant 1991-92 year progression ratios.
Column 1 equals column 2 * column 3,
Column 1 equals column 4 * column 5 * column 6,
Column 6 equals column 7 * column 8 * column 9 * column 10.
needs. Or it could involve an overall econometric analysis e.g. Ross Williams' (1984) study of the interactions between government and private outlays in education. However, the decomposition of expenditures should be an important input into such explanatory analysis.

Studies of the efficiency and effectiveness of particular programs in achieving educational, equity or economic objectives also require a higher level of analysis. The issues are discussed in relation to labour market programs in Stretton and Chapman (1990). Decomposition of expenditures would provide part of the input to studies of effectiveness. Note that, in the National Accounts (ABS 5204.0), constant price estimates of education are measured, along with the whole general government sector, such that its productivity change in general is zero. Government consumption expenditure is mainly revalued using fixed-weight indexes of material prices and wage rates. This is almost akin to using hours worked as an indicator of change. (ABS, 5216.0, 1990, p. 31)

The study of differences among States and Territories (e.g. IPA 1990) is not undertaken in this paper. Also there are changes in funding arrangements over time that are not fully reflected here. In the 1960s and early 1970s tax deductions were an important form of assistance to those who paid fees at non-government schools (and of some value for parents at government schools). Deductions are still available for donations to approved school building funds.

As with performance indicators, measures of resources and funding are open to misuse. Better data, further disaggregation of the data, alternative assumptions and alternative forms of presentation can affect the inferences drawn. For example, analysis for schools which deals only with total enrolments shows a greater increase in outlay per student than analysis which adjusts for changes in the composition of the student body - the increased proportion of students in secondary education in the 1980s due to demographic changes and to changes in participation rates. The choice of price index used to deflate nominal outlays can affect the estimate of real changes by several percentage points over the time period considered in this paper. Some of these particular examples are considered in the paper, but there are similar ones which it has not been possible to consider fully.

5. Government Schools

The decomposition of past recurrent expenditures on government schools and projections for the 1990s are presented in Table 1. As mentioned, the expenditure data are derived from the Australian Education Council collection which differs from that estimated by the ABS (Cat No 5510.0). The expenditures analysed are funded entirely by Commonwealth and State governments. Some private expenditures are made on government schools but these are not included in Table 1. A very rough estimate is that they equal about 2 per cent of government outlays.

Column 1 in Table 1 shows outlay on government primary and secondary schools less expenditure on buildings and grounds, deflated by DEET's recurrent Schools Price Index (adjusted to include the full effect of the second tier settlement in 1988). It shows the estimated changes in the quantity of inputs. There was very rapid growth in the 1970s of 6 per cent per annum. Growth of 2 per cent per annum occurred in the early 1980s, slowing in the later years. The increase of nearly 3 per cent in 1988-89 appears to be due in part to the increase in state benefits to students which are included in the AEC data. Commonwealth benefits to students such as AUSTUDY are not included. Column 2 shows the change in the general level of prices in the community (the deflator of GDP) divided by the index of school prices. The relative increase in the general level of prices compared with education prices from 1984-85 to 1989-90 substantially reduced the cost of education as a share of the GDP in those years. Inputs to schools (column 1) rose 6 per cent from 1984-85 to 1988-89, while outlays measured in average

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Table 2. Recurrent Expenditure on Government Schools: Decomposition 1973-74 to 2001-02: Growth Rates

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Sources: AEC, Summary Finance Statistics from the Government Section of the National Schools Statistics Collection
Commonwealth Schools Commission, Australian School Statistics, 1984
ABS (3201 0, 3222 0 and data on disk — Projection F, 4221 0)
DEET, Projections of School Enrolments 1993 to 2002, AGPS, 1993

Notes: Column 1 equals column 2 plus column 3,
Column 1 equals column 4 plus column 5 plus column 6,
Column 6 equals column 7 plus column 8 plus column 9 plus column 10
GDP prices fell by 5 per cent (column 3) The trend has since reversed, though the relative level of prices in 1991-92 remained 5 per cent lower than in 1984-85.

Enrolments in government schools fell from 1977-78 to the mid-1980s and have been fairly constant in recent years, as indicated in column 6. However, there have been some changes in the distribution of students among primary, junior secondary and upper secondary schooling. To account for this, 'student load' was estimated with weighted student numbers based on relative expenditure per student in 1989-90. (The estimated cost indexes for 1989-90 were primary 1.00, junior secondary 1.43, senior secondary 1.71) Changes in composition account for about 4 per cent of the increase in outlays over the period since 1973-74, but only about 1 per cent since 1984-85. The increase in primary enrolments since 1988 and the current decline in junior secondary enrolments have slightly reversed the trend of earlier years, despite the recent surge in the proportion of students staying on to year 12.

Column 7 shows Australia's total population has continued to grow at around 1.5 per cent per annum. However, the population aged 5-17 remained fairly constant in the 1980s, as indicated by the decline in its share of total population (column 8). The effect of rising retention rates are indicated in column 9, which shows the rise in the proportion of 5-17 year olds in schooling. However, for government schools this effect has been more than offset by the decline in the government share of total enrolments (shown in column 10). The trend away from government schools began in the late 1970s, but appears to have stopped in the last few years.

Projections for the 1990s in Table 1 are based on the lower enrolment projections prepared by DEET and are based on 1991 and 1992 student data. The implicit retention rate to year 12 in these projections is about 76 per cent for government schools compared with an actual retention rate of 74 per cent in 1992. A rate of 79 per cent for all schools is implicit in the projections compared with an actual rate in 1992 of 77 per cent for all schools and 87 per cent for non-government schools.

Column 6 of Table 1 projects a growth of about 10 per cent in enrolments over the decade to 2001-02. Student load is also estimated to grow by 10 per cent, implying a requirement for a 10 per cent increase in real outlays if 1991-92 levels of resources per student are to be maintained. (The recent cuts to staffing levels in Victoria, which could total 15 per cent, could contribute to a 4 per cent drop in the national average level of resources per student) The cost to the budget would also grow by 10 per cent if, as assumed in column 2, the wages and salaries of teachers and other school costs rise only in line with the general level of prices. This can be contrasted with a growth in GDP projected at 20 to 30 per cent over this period.

Growth rates implicit in Table 1 are summarised in Table 2. The growth rates in Table 2 can be treated as additive. Column 1 equals column 2 plus column 3; column 1 also equals column 4 plus column 5 plus column 6, and column 6 equals column 7 plus column 8 plus column 9 plus column 10. For example, in the decade to 1991-92 the annual growth in real outlay of 1.7 per cent was accounted for by a 0.6 per cent decline in relative costs and a 1 per cent increase in outlay measured in GDP prices (and a small rounding error). Real outlay per unit of student load also grew at 1.7 per cent per annum, with an 0.3 per cent per annum shift towards a more expensive composition of students offsetting an 0.3 per cent decline in the number of students. The rate of change in student numbers (column 6) of -0.3 per cent per annum is the sum of an increase in population (1.4), a decline in the proportion aged 5-17 (-1.6), an increase in the participation rate (0.4) and a swing from government to non-government schools (-0.6).
Table 3: GDP and Expenditure on Government Schools

Indexes, Base 1984-85 = 1.00

<table>
<thead>
<tr>
<th>Year</th>
<th>Real Expend. on Schools (1)</th>
<th>Expend. in Constant GDP Prices (2)</th>
<th>GDP (3)</th>
<th>Share of GDP (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1973-74</td>
<td>0.59</td>
<td>0.59</td>
<td>0.72</td>
<td>0.81</td>
</tr>
<tr>
<td>1974-75</td>
<td>0.67</td>
<td>0.68</td>
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</tr>
<tr>
<td>1975-76</td>
<td>0.74</td>
<td>0.75</td>
<td>0.77</td>
<td>0.98</td>
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<tr>
<td>1976-77</td>
<td>0.79</td>
<td>0.80</td>
<td>0.80</td>
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<tr>
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<td>0.85</td>
<td>0.85</td>
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</tr>
<tr>
<td>1978-79</td>
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<td>0.85</td>
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<td>0.90</td>
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<tr>
<td>1981-82</td>
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<td>0.91</td>
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<tr>
<td>1982-83</td>
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<tr>
<td>1984-85</td>
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<td>1.00</td>
<td>1.07</td>
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<tr>
<td>1986-87</td>
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<tr>
<td>1987-88</td>
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<td>1988-89</td>
<td>1.06</td>
<td>0.96</td>
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<tr>
<td>1989-90</td>
<td>1.06</td>
<td>0.99</td>
<td>1.20</td>
<td>0.85</td>
</tr>
</tbody>
</table>

Source: Tables 1 and 2 and ABS (5204 0)
Notes: Column (4) equals column (2) divided by column (3)
6. Government School Expenditure and the GDP

Table 3 compares the growth in real expenditure on government schools with the growth in the GDP measured in constant prices. Column 4 is an index of the share of GDP devoted to government schools. It rose from 0.81 in 1973-74 to 1.06 in 1977-78. It fluctuated in the following years, but fell rapidly from 1.06 in 1982-83 to 0.81 in 1989-90. On the projections in Table 1 the share is likely to fall in the 1990s. Real expenditure on government schools is projected to grow by 9 per cent in the decade to 2001-02. The GDP could be expected to grow by 20 to 30 per cent.

7. Concluding Comment

Resources per unit of student load in government schools increased at about 6 per cent per annum in the 1970s and by about 2 per cent per annum in the early 1980s. In the early 1970s the price of education (largely salary costs) rose faster than the general level of prices. From 1985 to 1990 prices in education, and indeed in the whole public sector, fell relative to the general level of prices. This was a major factor in the decline of public outlays as a percentage of GDP. From 1990 education prices have risen faster than the general level of prices.

Over the period from 1973-74 to 1991-92 the population of school age was roughly constant, with the population aged 5-17 declining as a percentage of a growing total population. The proportion of the 5-17 year olds at school rose, but enrolments in government schools fell from the late 1970s to the late 1980s because of a swing in enrolments to non-government schools.

The number of students in government schools is projected to grow by 9 per cent in the decade to 2001-02. This is based on a growth in the population of school age, a growth in participation rates and constant shares of enrolments for government and non-government schools. Student load as estimated in this paper is likely to grow in step with student numbers. Real expenditure per student is assumed to remain constant, so that total real expenditure is also projected to grow by 9 per cent. On the assumption that real wages and other costs in education grow only in step with the general level of prices - meaning constant real wages - then expenditure as measured in GDP prices will also grow by 9 per cent. The GDP is expected to grow considerably faster than this.

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School Finance Developments in U.S.A. and Some Implications for Australia

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Abstract

This paper presents some of the writer's reflections on the financial aspects of American schooling after he spent the northern winter of 1994/5 at the University of Arizona. He found financial devolution to be less than expected and less than many American educators themselves would like. One reason seems to be the dominance of litigation and court decisions which generate oppressive regulations and accountability requirements with which school districts must comply.

Of most interest were efforts to improve the information base of school finances — to trace where and how finances are spent at state, district and school levels. Australian schools could benefit from similar efforts, particularly if they were designed for decision-making rather than accountability purposes. Of particular interest in this regard is some work which links student achievement output measures of individual schools to their resource allocation patterns, enabling principals and their executives to assess the relative efficiency of possible alternative patterns.

1. Devolution

Before having the chance to observe the scene from close quarters, I had believed that principals of American schools were allowed a good deal of discretion in managing their schools. After all, schools were basically locally funded and this would give school administrators some independence from system directives. My impressions were supported by the extensive literature in American education on school-based decision-making. My experience over the last few months has made me realise the naivety of these preconceptions. American public schools typically appear to be agencies of central school district offices. School-based resource management is less than I had imagined. In the words of Wohlstetter (1994):

Past research has shown that SBM (school-based management) is everywhere and nowhere. Everywhere because school systems all over the country are involved in SBM, and nowhere because the extent of the decision-making authority devolved to schools is limited.

Teachers have even less scope to make decisions about the organisation of their work, which seems to contribute to reduced motivation and commitment to their schools.

2. Teacher Participation in Management

In an attempt to counter this motivational problem, the Consortium for Policy Research in Education (CPRE) has promoted a 'high involvement' model as a basis for systemic reform of American schools. The ideas (which are reminiscent of corporate management principles) are based on the observed practices of successful private sector high technology companies which have embraced decentralisation as a way to cope with complex, collegial and uncertain work, in an intensely competitive environment. These companies set clear performance targets, flatten...
the organisational structure, move decision-making down to the work teams actually providing services, and then hold those teams accountable for results.

The Director of the Finance Center for CPRE, Allan Odden (1994, p.106) identifies four critical resources which characterise decentralised units in this 'high involvement' model

*Information* — The unit’s goals and objectives are clear, and unit members have access to the data they need to pursue them.

*Knowledge and skills* — The unit devotes money and staff time to making sure that member practices reflect the best professional knowledge.

*Power* — Unit members have real authority over budget and personnel decisions.

*Rewards* — A compensation structure — usually based on knowledge and skills and often including group based performance bonuses — aligns employee self-interest with the unit's goals.

In an international search for a school system which displays these attributes, he finds that

In Victoria, it appears that at least three parts of the model have been fulfilled to a high degree.

Odden and his wife conducted interviews in eight Melbourne 'Schools of the Future' in 1993 and 1994. They comment specifically on the trust between School Council members and teachers, the wide range of long-term and short-term professional development opportunities available to staff, teachers' development of their own syllabi within system-wide curriculum frameworks and the considerable involvement of teachers in teams which make and implement school improvement plans.

Odden and Odden conclude (1994, p.5):

> We found substantial presence of the key components of high involvement management in the schools we studied. The findings support the tenets of the high involvement framework; namely, that if decentralisation is accompanied by information, knowledge, power and reward, and includes all teachers in decision-making, then school productivity is likely to increase.

They find, however, that Schools of the Future fall somewhat short of the fourth critical resource required in their model:

Victoria hasn’t developed a powerful reward system to encourage teachers to work toward school-wide goals for student achievement. So far, schools have emphasised individual student performance, and haven’t developed strong consensus on school goals and common measures of progress.

Nevertheless, the overall finding of Odden and Odden is that "from teacher testimony, and increases in the high school graduation rate (improved student achievement) appears significant, and the level of teacher ownership attained would be the envy of many schools around the world.

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1 After the drubbing given Victoria’s schools by its state government, it is a pleasant surprise to discover that the system is given high marks by an international observer.
Why is it that American schools have not yet devolved financing and management to school level? The first explanation seems to be the degree to which law court decisions dominate the administration and finance of education in the United States. The second, related reason is that the basic unit of funding is the school district, not the school.

3. The Dominance of Litigation

I have been amazed at the power of litigation to dominate the allocation of resources to and within schools. In a speech to a March, 1995 meeting of the American Educational Finance Association (AEFA) in Savannah, the Attorney General of Missouri stated that in order to comply with court rulings, his state was spending as much as 45% of its entire K-12 budget on 9% of its schools. McCarthy (1994, p.89) points out that most major school finance reform efforts across the United States have been precipitated by or accompanied by litigation. Over the last six years, state supreme courts and lower courts have ruled unconstitutional the school finance systems of twelve states and there is ongoing litigation in another twenty four (Fulton, 1994c, p 13).

For good or ill, these 'lay' judges are raising fundamental questions for political policymakers:

- What is the basic educational program that a state must provide for all students?
- What does such a program cost?
- How should it be funded?
- What is the state responsibility as defined in the education clause of the state constitution?

Courts in some states have gone so far as to identify 'key learning areas' within which each student must gain at least a minimum level of competence for an adequate educational opportunity.

Non-policymaker, non-educator judges are thus driving much of the financial and educational decisions of state educational systems (Fulton 1994c, p 12):

Some judges actually are defining an 'efficient' and an 'adequate' education and are charging state lawmakers with designing a funding, and possibly an entire education system that supports this definition.

Perhaps it is fortunate that there are external arbitrators to the political and educational systems. I cannot help thinking, however, that concern with court rulings dominates both policy making and research in American school finance. As one example, a paper offered at the 1995 AEFA conference by a group of senior researchers reported the relationship found in samples of secondary schools in three states, between fiscal capacity and the breadth of school curricula (Salmon, Strickland and Hiller 1995). The researchers found that in all three states, student enrolments in a variety of university preparatory and advanced placement courses were significantly higher in rich than in poor schools. The motivation for the research was that for several years there has been debate in courts about whether there is a link between fiscal capacity and the number of academically challenging courses offered by local school districts.

In discussion, I came to realise that the sole perspective of the researchers was that of 'supply'.

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2 Their observations place a new twist to the old saying, "Would that we could see ourselves as others see us!"
That is, they wanted to show that rich schools could afford to offer academically challenging courses, while poor schools could not. Their implicit assumption was that if poor schools became rich, they would spend their additional funds in providing these academically challenging courses. The researchers were not prepared to acknowledge that there was also a ‘demand’ perspective which recognises that the nature of an offered curriculum is heavily influenced by the choices of students. It could be that those in poor schools might choose to study vocationally relevant rather than academically challenging courses so that if these schools became rich, they might still choose to offer more vocational rather than more academic courses.

The point of this story is that in their keenness to contribute to a court debate, these researchers appear to have lost some of the objectivity required of high quality educational research.

4. District and School Expenditure Information

Elected district school boards are legally responsible for administrative and resource oversight of all their constituent schools. District fiscal committees and budget officers apply for resources from state and federal authorities and account for their use. To meet these accountability requirements, district officers have tended to design their financial systems in accordance with legal requirements rather than educational program purposes. Schools are provided with resource entitlements—teachers, books, transportation—but rarely are they provided with block financial grants over which they could exercise significant expenditure discretion (Odden 1994, p.107).

There are signs of change, however. Courts are increasingly focusing on the needs of each child rather than the aggregate needs of the district (Monk and Roellke 1995, p.5) and so judges are now raising questions about how resources provided to individual schools are translated into achievement opportunities for individual children (Fulton 1994c). Such matters are redirecting attention from the level of the district to that of the school and the classroom.

These developments, together with tightening district budgets, are prompting the question “how much of district expenditure is spent on actually teaching students?” Walberg (1994, p 78) argues that it is very little. He quotes research in New York and California to claim that a large proportion of schooling budgets are absorbed by central-office staff and by in-school non-teaching staff. To support his case, Walberg quotes a detailed investigation which found that less than one third of the expenditures on New York schools in 1988-89 was actually spent on classroom instructional services. Central office staff took nearly half the money and another sixth was absorbed by in-school, non-teaching staff.

Walberg's argument is not supported by Monk and Roellke (1995, Table 1a) whose survey of 645 'non-metropolitan' school districts throughout New York State in 1991-2 did not find any excessive ratio of administrators to teachers. They did find, however, that the administrator:teacher ratios were indeed higher in New York City and four other metropolitan areas in the state (Monk and Roellke 1995, Table 1F).

Confirmation of the unaccounted growth of school administrators in New York City (and the defensiveness of bureaucrats) was given recently by Herman Badillo, special counsel in charge of 'fiscal oversight' in the City. He reported (Badillo 1995)

When the mayor took office, he tried to get the facts about how the $8 billion was spent from the Chancellor and the (School) Board, but each time, there was shifting figures about exactly how many administrators there were. For example, at one point, the Mayor wanted to cut 2,500 administrators. The Board said it
can't be done. Then they discovered they had 6,300 more administrators than they thought they had, so the Mayor said, "Good, now maybe you can cut 2,500." "No, we still can't." Finally one day, they came in and said, "Oh, yes. We just discovered we can, in fact, cut 2,500 administrators."

Stories like this have fuelled public suspicion about the wastefulness of educational spending in the US. Communities and taxpayers are demanding to have fuller and clearer financial reporting of school expenditures. One response has been the joint development of the Finance Analysis Model (FAM) by the Center for Workforce Preparation of the US Chamber of Commerce and the professional services firm, Coopers and Lybrand (1995). Designed for use on personal computers, the model provides a framework within which school districts can report the distribution of either their budget or their actual expenditures at both district and individual school levels.

The FAM consists of a series of multi-dimensional worksheets that compile information on district and school expenditures. The three basic dimensions are:

(i) a functional dimension showing expenditures and budgets that comprise all of the district's funds divided into one of five categories — instruction, instructional support, operations, other commitments and leadership,

(ii) a program dimension that provides community leaders with accurate information on the costs of educational programs such as special education, gifted and talented, bilingual, general and other programs; and

(iii) a grade level dimension that allows school districts to determine the costs of functions and programs in the different school types.

The structure of one spreadsheet of the model is shown in Figure 1. A school would have a separate spreadsheet for each of its programs (e.g. general education, special education, extra curricular activities, etc.) The aggregated programs of each school contribute to a school district report, and the aggregated school district reports are consolidated into a state report.

**Figure 1: Spreadsheet for One School District Program (e.g. Special Education) in Financial Analysis Model**

<table>
<thead>
<tr>
<th>Functions</th>
<th>Elementary</th>
<th>Middle</th>
<th>High</th>
<th>Alternate</th>
<th>Other</th>
<th>Non-School</th>
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<tr>
<td>Instruction</td>
<td>$ %</td>
<td>$ %</td>
<td>$ %</td>
<td>$ %</td>
<td>$ %</td>
<td>$ %</td>
</tr>
<tr>
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<td>$ %</td>
<td>$ %</td>
<td>$ %</td>
<td>$ %</td>
<td>$ %</td>
<td>$ %</td>
</tr>
<tr>
<td>Operations</td>
<td>$ %</td>
<td>$ %</td>
<td>$ %</td>
<td>$ %</td>
<td>$ %</td>
<td>$ %</td>
</tr>
<tr>
<td>Other commitments</td>
<td>$ %</td>
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<td>$ %</td>
<td>$ %</td>
<td>$ %</td>
<td>$ %</td>
</tr>
<tr>
<td>Leadership</td>
<td>$ %</td>
<td>$ %</td>
<td>$ %</td>
<td>$ %</td>
<td>$ %</td>
<td>$ %</td>
</tr>
</tbody>
</table>

Source: Center for Workforce Preparation and Coopers and Lybrand 1995, p 16

The FAM is a good attempt to report school financial transactions in a clear, readily understandable way. Its use is limited as a school management tool, however, because its orientation is to reporting and accountability. This means that it suppresses such factors as curriculum variables important for management and planning. Further, while it uses the school
as its basic unit, its focus is still at the school district level so the expenditure categories are broader than the individual principal would need for self-evaluation and review. For example, it treats as 'general education', those teaching and learning activities that absorb the great bulk of school expenditures. The program categories at least need to be broken into expenditures on key learning areas, and educational levels subdivided into single or grouped years

An educational management tool which provides a nexus between financial viability and curriculum arrangements in Australian non-government schools is already available (Harrold, 1988). The development of similar tools, structured like the FAM, would do much to improve the financial information base of schools in state systems. All states have developed computerised management information systems which record financial and time allocation data using definitions which are consistent for all schools. It should not be too difficult to reformulate this information along the FAM lines to provide better information for resource allocation reporting, decision-making and planning at system, regional and individual school levels.

The most important and often difficult resource allocation decisions in schools pertain to the deployment of teachers' time among key learning areas and year levels. While this task is not seen to be financial in nature, it clearly has major financial implications. Those who must make such decisions would surely welcome any tool which provided a clear analysis of current deployment and the implications of redeployment — whether or not it is part of a larger FAM.

A detailed analysis of teacher time deployment among curriculum areas and year levels has already been made for Queensland rural high schools (McKenzie, Harrold and Sturman, 1995, Ch 4). This used the staff returns of individual schools which were submitted electronically to the state department's head office. Those who are interested in the possibilities of using time allocation data for managerial decision-making should read this work. Queensland secondary principals can compare their staff deployments with state average deployments.

My argument is that in the US, tools are being developed to improve the reporting of the financial performance of school systems, districts and individual school sites. Australian schools would benefit from the development of similar tools here — particularly if they were designed primarily for resource decision-making purposes.

5. Performance Measurement

One field in which American schools are well advanced is the widespread administration of standardised achievement tests and the use of their results in debates over policy and decision-making. After the publication of A Nation at Risk in 1983, an increasing number of states developed their own testing and indicator programs, the results of which were published for individual districts and even for individual schools. The assessment movement received a further boost in 1990 when an Education Summit of President Bush and fifty state governors developed six educational goals to be achieved nationally by the Year 2000. The Summit established the National Assessment of Educational Progress (NEAP) to set specific standards and to monitor progress toward these goals. Its governing board has set basic, proficient and advanced levels of attainment for grade levels 4, 8 and 12 in all major subjects and has developed appropriate tests of their attainment.

In Australia there is a long history of opposition to widespread student assessment. It is true that in America the use of test results for accountability purposes has affected, if not distorted the pursuit of local educational goals, and insufficient attention is given to the socio-economic and educational backgrounds of tested students. But it is also true that school education has benefited politically from the public concerns that have been generated by the publication of
national testing results.

To illustrate, Nettles (1995, p.293) claims that these "powerful indicators (which) seize the public imagination and simultaneously provide persuasive evidence of the nation's educational crisis ... has proven vitally important and effective during the past decade in rallying public action, shaping national goals and charting the course of national educational policy".

Nettles argues that higher education also should develop standardised national achievement tests, for without such measures, the higher education sector lacks the evidence to demonstrate to the electorate the crisis of declining quality in American collegiate education. He states (Nettles 1995, p.294)

As a result, the public perception remains that the nation's elementary and secondary schools are of low quality, but the problem of colleges and universities is not their quality but their costs, accessibility, fraud and abuse, especially in student financial aid.

6. Modelling School Efficiency

The availability of information about the comparative performance of a school's students in the major subject areas, gives principals and their staff a valuable means of self-evaluation and reflection — particularly if it is related to the patterns of resource allocation. The Financial Analysis Model, even if extended and modified in the manner which has been suggested, would show input allocations only. But by relating these allocation patterns to measures of learning outputs, a real opportunity would exist to analyse the efficiency of school resource use. This would not be an easy task, however, for resource allocations in any school are complex and even within the school executive there are differences of opinion about the relative importance of student performance in different subject areas.

An analytical framework is needed to bring together a school's achievement and allocational data in a way that allows informed, meaningful debate. Jim Phelps, a superintendent in the Michigan Department of Education, has developed a useful approach to modelling the relationships between any allocational pattern of a school and its academic performance measures. His model is not simple, since he uses "non-linear optimisation programming", but he is currently working on ways for school administrators to enter their own school's information and to obtain intelligible, meaningful results (most of which are produced in graphical form) that can be used as a basis for debate and planning by school executives. For example, the model places a school's performance within the context of the comparable performance of its peer schools.

The Phelps model permits the user to undertake simulation exercises to show the implications of giving alternative priority weights to outputs and the opportunity costs of specific reallocations. Such exercises would be valuable for those involved in school evaluation and planning.

The possibilities of adapting Phelps' analysis for Australian schools are promising, although the process of development and implementation could be slow and expensive. Once completed, it would require a major professional development effort to persuade principals of its value for improving their schools' performance within given resource constraints.

7. Conclusion

One impression I now have of the differences between American and Australian schools is their different focal units. While there are signs of change, the school district remains the focus for
administration and finance in most US states. In Australia, following devolution reforms, the school site is more the focus. Consequently Australian school principals seem to have more discretion in, and responsibility for, financial management than their American counterparts.

In both countries, tight public financial conditions are increasing pressures for improved management practices. Because the school is the locus of the delivery of teaching and learning (i.e. "where the rubber meets the road") it is the school site principal and his/her executive who must make the most important management decisions affecting efficiency.

Decisions are likely to be wiser if they are based on appropriate, timely information. There are moves in the US to improve the information base of school education, but most of it is for accountability rather than managerial purposes. Australia can learn from these moves and adapt the ideas where necessary to serve the management and planning of our own schools.

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Female Participation, Hours of Work, and Earnings: Evaluating the Importance of Schooling and Fertility

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Abstract

A model of career path choice is constructed for a sample of women taken from the 1991 US National Household Education Survey. This allows for simultaneity and selection effects in the relationship between regime choice and earnings. It is established that, inter alia, expected earnings have a significant impact on the career path and the hours of work chosen by American women. The role played by formal schooling and by childrearing in the determination of career path is highlighted, and implications are discussed.

1. Introduction

A striking feature of many economies in the last half century has been the dramatic increase in female labour force participation. Much of this increase is accounted for by part-time employment, according to official definitions, about a quarter of working women in the US now work part-time. Women present a challenge to economic modellers not only because of the way in which they make choices about whether or not to work, but also because they make much more complex decisions than men about the length of their working week. In estimating women's earnings functions, sample selection effects attached to the participation decision and the part-time versus full-time decision need to be accommodated. In this paper, such an exercise is attempted within a model of occupational choice, using a new data set based on a household survey of adult Americans.

Despite the above observations, part-time employment of women in the US is less extensive a phenomenon than in many other developed countries, and consequently it has been less extensively studied. A good entry point into a rather scanty literature is a paper by Ehrenberg et al (1988). Household composition, education, ethnicity and age all affect the propensity for working women to choose part-time work (Blank 1989). At the same time, it

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* This paper was presented to a seminar at the Centre for the Economics of Education and Training, Monash University, Melbourne on 28 June 1995. The NHES data were supplied through the ESRC Data Archive and ISGPR. Much of the work reported here was conducted while the author was Visiting Fellow in the Economics Program of the RSSS at the Australian National University. Without implication, the author thanks Steve Bradley for useful comments.

† This is a lower proportion than in many other OECD countries, possibly because the availability of company health insurance and other fringe benefits are often provided only to full-time workers (Montgomery and Cosgrove 1993, Vella 1993). Unfortunately the NHES do not allow the analysis of fringe benefits, this should not prove too severe a problem, however, since Blank (1990) finds a strong positive correlation between fringe benefits and wages. The official definition of part-time workers (and the one adopted here) is those workers usually employed for under 35 hours per week.
is well documented that part-time workers tend to be paid lower hourly wages than their full-time counterparts (de Neubourg 1985), although this may in large measure be due to unobserved heterogeneity (Blank 1990).

Less recognition has been given in the literature, however, to the fact that earnings and choice of full-time or part-time status are simultaneously determined outcomes. The aim of the present paper is to build on the existing literature in two respects. First, we explicitly model the endogeneity between relative wages and decisions made by women about participation, hours of work and occupational choice. While the received literature acknowledges the impact of regime choice upon wages, the manner in which the expected remuneration in each regime influences individuals' choice of career path has not been the subject of extensive study. Second, by simultaneously modelling participation, hours of work and (crudely defined) occupational choice, we can examine how unmeasured non-pecuniary returns to work in different occupations can influence the participation decision and the part-time versus full-time work decision.

It may be useful at this early stage to anticipate the main findings of the paper. First, expected earnings do have an important bearing on the participation and career choices of women. Second, the analysis presented here suggests that some of the stylised facts about the determinants of female participation are in need of refinement. To be specific, the relationship between unearned household income and participation, and the relationship between childrearing and participation, are more complex than has heretofore been acknowledged. Third, the impact of a universal increase in formal education is to increase female labour market participation, while the impact of a universal increase in childrearing is to reduce it; the magnitude of these effects is quantified, and it is found that the size of the schooling effect, in particular, is rather small.

The remainder of the paper is structured as follows. Section 2 describes the data set under examination, and outlines the method of analysis. Section 3 presents and discusses the results. The paper ends with a conclusion and suggestions for future research.

2. Method and Data

The data used here come from the adult education component of the 1991 National Household Education Survey (NHES). This is a random digit dial telephone survey conducted on behalf of the US National Center for Education Statistics, and it contains a large amount of interesting labour market information in addition to detailed data concerning individuals' investment in pre- and post-compulsory education. Data are available for some 12,568 respondents, of whom 6,860 are female. Some of these are excluded from our analysis owing to missing data for the schooling variable, while others (aged under 23 or over 65 years) are excluded because they are likely to be retirees or pre-entrants, this leaves a useable sample of some 4,522 women. The NHES has previously been the subject of study by Hollenbeck (1993). The survey data have been augmented by additional information on spatial variations in unemployment rates which is straightforwardly

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2 An excellent exception is to be found in the work of Mroz (1987), who stresses the need in estimating the determinants of labour supply to endogenise earnings other than by instrumentation using labour market experience. He argues also for the use of non-naive methods to correct for sample selection bias. These matters are pursued in the present paper.

3 These data were kindly provided by ICSPR through the ESRC Data Archive.
grafted onto the main data set using the census division codes in the NHES 4

The methodology used follows the refinements to the Heckman (1979) model of sample selectivity due to Lee (1983) and Maddala (1983). First a limited dependent variable method is used to estimate a reduced form model of occupational choice and extent of participation Since the determinants of this include earnings relativities across occupations and across the divide between part-time and full-time status, there is an endogeneity problem which can be countered by including as arguments in this model all the determinants of earnings (but not earnings per se), in effect producing a reduced form model

The analysis of labour market decisions of women is, of course, complicated by the need to model explicitly the participation decision In this paper the participation decision is assumed to be made simultaneously with the decisions on which occupation to pursue and whether to work full-time or part-time 5 The impact of this participation choice, and of the other career path choices made by women, on earnings is complicated by sample selection effects

To be more specific, the paper proceeds by estimating a mixed discrete choice and multinomial logit estimator in which the probability that individual i pursues a career path j is given by

$$P(q_i = j) = \exp \left\{ \sum \alpha_{k} x_{ki} + \beta Y_{ij} \right\} / \sum_{j} \exp \left\{ \sum \alpha_{k} x_{ki} + \beta Y_{ij} \right\} \text{ j = 0, 3, i = 1, 4522} \quad (1)$$

where $Y_{ij}$ represents the earnings which i could expect to make in career path j, $x_{ki}$, $k = 1, K$ are exogenous variables, and

$\alpha_{k}, \forall k,j$ and $\beta$ represent the parameters of the model to be estimated

The coefficients $\alpha_{k0}$ $\forall k$ are constrained to zero. Note that the $\alpha$ coefficients are allowed to vary across career paths while $\beta$, as the discrete choice component of the mixed model, is not 6 The values of j from zero through 3 represent respectively non-participation, full-time employment as a knowledge worker (based in a non-manual or skilled manual occupation),

4 To be specific, mid-year regional unemployment rates obtained from the US Statistical Abstract were grafted onto the data set with the intention of identifying a wage curve effect (Blanchflower and Oswald 1990)

5 Some other studies adopt alternative approaches For instance, some of the models investigated by Dolton and Makepeace (1993) and Blank (1990) assume that the participation decision precedes the occupational choice decision Neither approach would appear to be inconsistent with the evidence which we have about the way in which women make their labour market decisions I adopt the latter approach on the NHES data in another paper (Johnes 1995).

6 The specification thus bears some resemblance to a model used in the analysis of training decisions due to Makepeace (1994)' The models differ, however, in the manner in which individuals are assumed to predict earnings in each regime Makepeace (justifiably in the context of his problem) assumes that sample selection biases are absent in the calculation of predicted earnings, but our data do not allow us the luxury of making such an assumption, and this adds a further complication to our analysis
other full-time employment, and part-time employment.

The first step in estimating equation (1) is to specify the reduced form of the multinomial logit career path equation (a selector equation), in which all determinants of earnings appear as exogenous explanatory variables. The method of Lee (1983) is then used to evaluate selection terms from this equation for use as augmenting variables in the outcome (earnings) equations for each career path choice. Once an earnings function has been estimated for each career path (along with corrected standard errors), the expected earnings for each individual following each career path can be evaluated and used as an argument in the final equation of the model, which is a discrete choice multinomial logit structural model of career path choice.

3. Results

Candidates for the determinants of earnings or of career path choice which should be considered for inclusion in the selector equation include the following. The years of formal schooling and both linear and quadratic terms in the individual's age are standard components of earnings functions (Mincer 1974). More recently, Murphy and Welch (1990) have urged researchers to augment this specification by including also cubic and quartic terms in the respondent's age, this was tested unsuccessfully in early runs, and so we retain only the linear and quadratic terms in age in the specification reported below. In addition to formal schooling, the NHES data set contains extensive information about adult education, this might take a wide variety of forms, from basic literacy courses, through job-related training, to part-time study for a degree. This information is included in the analysis in the form of a binary variable which flags individuals who have ever undertaken such forms of adult education.

Family responsibilities are captured by linear and quadratic terms in a count of children under 16 years of age. A current marital status dummy is also included. The main measure of household income used in the study is total household income excluding the woman's earnings. The strength of this income effect might be expected to vary with the level of income, and in order to capture any such phenomenon a further explanatory variable is introduced into the analysis; this equals the 'other household income' variable for those respondents reporting total annual household income below $20,000, but is zero for others. It is expected that this variable will pick up any distortions in labour supply behaviour due to poverty traps in the welfare system. For similar reasons, a variable which equals zero for respondents with total annual household income of $20,000 or more, and which is unity for other respondents with children below the age of 16 years, is also included.

A proxy for hidden attitudinal variables (a dummy indicating whether or not the respondent has visited a library in the last twelve months) is also included. Finally, industry dummies (for manufacturing and services) appear too. These may influence earnings (Krueger and Summers 1988) though at this level of aggregation we find no evidence that this is so, equally plausibly, there may exist systematic inter-industry differences in the utility gained by women from work, and so industry variables might contribute directly to the career path choice of women in the sample. In early experiments, the local unemployment rate was used as an

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7 Knowledge workers are defined to include those in all occupations other than those coded N, O, P, Q, R, S, T, U and Z in the NHES. Part-time workers of both 'occupations' are pooled into a single group in order to avoid problems of a small sample. The earnings data refer to the current or most recent job. Any bias due to inflation is small since the number of respondents participating in the labour market but who have not worked during the year prior to the survey is negligible.
explanatory variable, but at no time did it produce the significantly negative coefficients which previous work might lead us to expect (Blanchflower and Oswald 1990), this may be due to the highly aggregated coding of spatial variables in the publicly available NHES Spatial information is, however, included in the form of a binary variable indicating residence in an urban (standard metropolitan) area.

Descriptive statistics of all variables used in the analysis appear in Table 1. The first stage in the modelling procedure is to estimate a reduced form multinomial logit in which all variables deemed to affect either earnings or career path choice are included as arguments. The results of this model are, for conciseness, not reported here. The estimates are constructed as a means of generating sample selection terms for use in the earnings equations, using the method of Lee (1983).

Table 1: Descriptive Statistics of Explanatory Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years of schooling</td>
<td>13.98</td>
<td>1.98</td>
</tr>
<tr>
<td>Adult education</td>
<td>0.81</td>
<td>0.39</td>
</tr>
<tr>
<td>Age</td>
<td>39.16</td>
<td>10.80</td>
</tr>
<tr>
<td>Used library in last year</td>
<td>0.64</td>
<td>0.47</td>
</tr>
<tr>
<td>Annual other household income</td>
<td>16,465</td>
<td>17,866</td>
</tr>
<tr>
<td>Number of children</td>
<td>0.65</td>
<td>1.01</td>
</tr>
<tr>
<td>White</td>
<td>0.80</td>
<td>0.40</td>
</tr>
<tr>
<td>Urban</td>
<td>0.81</td>
<td>0.39</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>0.17</td>
<td>0.38</td>
</tr>
<tr>
<td>Services</td>
<td>0.73</td>
<td>0.45</td>
</tr>
</tbody>
</table>

The earnings functions are reported in Table 2, these include the preferred specification both with and without the selection terms. The dependent variable used is a measure of the log hourly wage, derived from the annual salary and the hours worked questions of the NHES. The reported specifications were reached by starting from a general specification and sequentially dropping the least significant variable until all coefficients in the model with selectivity exceeded the corresponding standard errors. The selection term is significant in the case of part-time workers, and exceeds unity also for other full-time workers. The fit of the earnings equation, as measured by $R^2$, is noticeably worse for part-time workers than for those working full-time, this may be due to unobserved heterogeneity amongst this group. For full-time workers, the measured coefficient of determination is in line with those obtained in other studies.

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8 They give a similar message to the results of the mixed model reported in Table 3.
Table 2: Earnings Function by Career Path; With and Without Selectivity; Schooling not Instrumented

<table>
<thead>
<tr>
<th>Variable</th>
<th>F-T Knowledge Workers</th>
<th>F-T Other Workers</th>
<th>Part-Time Workers</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \lambda )</td>
<td>-0.0626 (0.0649)</td>
<td>-0.0544 (0.0450)</td>
<td>0.6919 (0.3400)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.3214 (0.3094)</td>
<td>0.6395 (0.2128)</td>
<td>3.2236 (1.4550)</td>
</tr>
<tr>
<td></td>
<td>0.0751 (0.1751)</td>
<td>0.6549 (0.2134)</td>
<td>3.3126 (1.4750)</td>
</tr>
<tr>
<td>Schooling</td>
<td>0.0661 (0.0108)</td>
<td>0.0470 (0.0110)</td>
<td>0.0920 (0.0543)</td>
</tr>
<tr>
<td></td>
<td>0.0744 (0.0064)</td>
<td>0.0379 (0.0080)</td>
<td>0.0933 (0.0550)</td>
</tr>
<tr>
<td>Adult ed.</td>
<td>0.1195 (0.0329)</td>
<td>0.1545 (0.0314)</td>
<td>0.1509 (0.0314)</td>
</tr>
<tr>
<td></td>
<td>0.1289 (0.0315)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.0483 (0.0089)</td>
<td>0.0400 (0.0105)</td>
<td>-0.2157 (0.0716)</td>
</tr>
<tr>
<td></td>
<td>0.0524 (0.0079)</td>
<td>0.0425 (0.0103)</td>
<td>-0.1644 (0.0680)</td>
</tr>
<tr>
<td>Age(^2)</td>
<td>-0.0004 (0.0001)</td>
<td>-0.0004 (0.0001)</td>
<td>0.0027 (0.0008)</td>
</tr>
<tr>
<td></td>
<td>-0.0005 (0.0001)</td>
<td></td>
<td>0.0021 (0.0008)</td>
</tr>
<tr>
<td>Married</td>
<td>0.0757 (0.0339)</td>
<td>0.0790 (0.0400)</td>
<td>-0.9632 (0.2655)</td>
</tr>
<tr>
<td></td>
<td>0.0963 (0.0144)</td>
<td></td>
<td>-0.7934 (0.2559)</td>
</tr>
<tr>
<td># children</td>
<td>-0.0259 (0.0144)</td>
<td>-0.0265 (0.0142)</td>
<td>0.5106 (0.1513)</td>
</tr>
<tr>
<td></td>
<td>0.5445 (0.1525)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Library user</td>
<td>0.0270 (0.0236)</td>
<td>0.0574 (0.0282)</td>
<td>0.0529 (0.0281)</td>
</tr>
<tr>
<td></td>
<td>0.0265 (0.0236)</td>
<td>0.0574 (0.0282)</td>
<td>0.0529 (0.0281)</td>
</tr>
<tr>
<td>White</td>
<td>0.0758 (0.0285)</td>
<td>0.1203 (0.0329)</td>
<td>0.1258 (0.0327)</td>
</tr>
<tr>
<td></td>
<td>0.0801 (0.0282)</td>
<td>0.1203 (0.0329)</td>
<td>0.1258 (0.0327)</td>
</tr>
<tr>
<td>R(^2)</td>
<td>0.131</td>
<td>0.138</td>
<td>0.072</td>
</tr>
<tr>
<td>N</td>
<td>2577</td>
<td>1127</td>
<td>347</td>
</tr>
</tbody>
</table>

Source: Standard errors in parentheses. For the models with selectivity, standard errors have been corrected using the method of Lee (1983).

Both formal schooling and adult education contribute to the earnings of full-time workers. Adult education, however, is not a significant determinant of part-time earnings. Under certain conditions, the coefficient on schooling may, following Mincer (1974), be used as a means of evaluating the private rate of return to education. The coefficient on adult education may not be so interpreted, since most adult education does not preclude full-time employment and does not therefore involve the sacrifice of one year's earnings (though it involves other sacrifices of time and sometimes also of money). The impact on earnings thus suggests that adult education is an attractive investment for the private individual if she expects to enter full-time employment.

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9 The private rate of return to this model is 100(e^\( \alpha_s \) - 1), where \( \alpha_s \) denotes the coefficient on the years of schooling variable. This assumes, *inter alia*, that the private opportunity cost of one year's extra schooling equals earnings foregone.
The coefficients on the polynomial terms in age have the expected signs and are highly significant in the case of full-time workers. For part-time workers the signs are reversed, indicating that these workers have entered a transient stage of the life cycle in which family commitments reduce commitment to the labour market. The substantial difference in age-earnings profile which may be observed between full-time workers (of either type) on the one hand, and part-time workers on the other, is worthy of note, and throws light on the insignificance of the cubic and quartic age terms reported earlier. The attitudinal variable (library use) has the expected direction of influence for full-time workers. Family composition has no bearing on the earnings of full-time knowledge workers, but affects in different ways the earnings of other workers. White women in full-time work earn more than do comparable women of other races, for knowledge workers the gap is 8 per cent, while for other full-time workers the gap rises to 13 per cent. No significant race effect could be found in the case of part-time workers.

The final stage of the modelling procedure involves modelling the structural form of the career path model as a mixed multinomial logit and discrete choice problem, thereby estimating the parameters of equation (1). The construction of the predicted earnings for each career path is complicated by the need to include, as a determinant of predicted earnings, the sample selection term, \( \lambda_{ij} \), for each individual \( i \) in each regime \( j \). This is calculated as

\[
\lambda_{ij} = \phi(\Phi^{-1}(F_{ij})) / \Phi(\Phi^{-1}(F_{ij}))
\]

where \( F_{ij} \) is the probability with which the multinomial logit model predicts individual \( i \) will enter regime \( j \), and where \( \phi \) and \( \Phi \) denote respectively the density and distribution of the standard normal. For the non-participation regime, predicted earnings are set to nil.

The estimates of the mixed model appear in Table 3, and a selection of the marginal probabilities is reported in Table 4. The first, and for the purposes of our analysis most important, result is the coefficient, \( \beta \), obtained on the predicted earnings variable. This is, as expected, positive and highly significant. In deciding whether to participate, whether to work full-time or part-time, and which occupation to pursue, women respond to signals concerning the earnings which they could expect to make in each regime. Two notable features stand out from this result. The first is the strong influence of predicted wage in each of the two full-time regimes on participation in both of those regimes. The second notable feature is the low value of the marginal probabilities in the part-time regime. Women who are likely to work full-time appear to be very sensitive to variations in remuneration, while those likely to work part-time are not.

A characteristic of non-linear estimation methods of the type employed here is that the results lack straightforward interpretability. In particular, the marginal effects of variables which influence career path both directly and indirectly (through their influence on predicted earnings) are difficult to evaluate. This applies to the age, race, family composition, library use and education variables in the present analysis. A second difficulty concerns the manner in which marginal effects are typically evaluated. The usual procedure is to evaluate such effects at the mean values of the explanatory variables, but this is problematic where these variables take the form of binary or count data. It is meaningless to evaluate marginal effects of childrearing, say, at mean values, because no-one in the sample has 0.63 children and no-one in the sample could contemplate making a marginal change of less than unity in the number of children in their family. To alleviate these problems, two experiments are carried out in the remainder of this section. These investigate the impact on career path choice of two types of exogenous shock: the first takes the form of a unit increase in the number of years of formal schooling received by all respondents, while the second is a unit increase in the number of the respondents' children under the age of 16 years.
Table 3: Mixed Discrete Choice and Multinomial Logit Model of Career Path Choice (Schooling not Instrumented)

<table>
<thead>
<tr>
<th>Variable</th>
<th>All Workers</th>
<th>F-T Knowledge Workers</th>
<th>F-T Other Workers</th>
<th>P-T Workers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0.8440</td>
<td>(0.1593)</td>
<td></td>
</tr>
<tr>
<td>Predicted Wage</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-4.5737</td>
<td>4.0147</td>
<td>(0.4911)</td>
<td>-1.6622</td>
</tr>
<tr>
<td>Schooling</td>
<td>0.2729</td>
<td>-0.2213</td>
<td>(0.0291)</td>
<td>0.0954</td>
</tr>
<tr>
<td>Adult education</td>
<td>0.7534</td>
<td>0.4233</td>
<td>(0.1278)</td>
<td>0.1324</td>
</tr>
<tr>
<td>Age</td>
<td>-0.0369</td>
<td>-0.0487</td>
<td>(0.0486)</td>
<td>-0.0377</td>
</tr>
<tr>
<td># children</td>
<td>1.0230</td>
<td>1.2439</td>
<td>(0.1466)</td>
<td>-0.2398</td>
</tr>
<tr>
<td>(# children)^2</td>
<td>-0.1809</td>
<td>-0.2227</td>
<td>(0.0380)</td>
<td>-0.0103</td>
</tr>
<tr>
<td>In other h/h income</td>
<td>0.0539</td>
<td>0.0556</td>
<td>(0.0106)</td>
<td>0.0570</td>
</tr>
<tr>
<td>Poor * In other h/h income</td>
<td>-0.1161</td>
<td>-0.1198</td>
<td>(0.0266)</td>
<td>0.0517</td>
</tr>
<tr>
<td>Poor * any children</td>
<td>-1.0569</td>
<td>-1.2948</td>
<td>(0.2820)</td>
<td>0.5805</td>
</tr>
<tr>
<td>White</td>
<td>0.4863</td>
<td>0.3540</td>
<td>(0.1299)</td>
<td>0.1073</td>
</tr>
<tr>
<td>Urban</td>
<td>-0.2269</td>
<td>-0.4609</td>
<td>(0.1466)</td>
<td>-0.5303</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>1.8141</td>
<td>0.7672</td>
<td>(0.2075)</td>
<td>-0.0749</td>
</tr>
<tr>
<td>Services</td>
<td>2.0651</td>
<td>-0.0520</td>
<td>(0.1715)</td>
<td>1.5938</td>
</tr>
<tr>
<td>Log-likelihood</td>
<td>-4092.218</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Standard errors in parentheses.
Table 4: Marginal Effects

<table>
<thead>
<tr>
<th>Variable</th>
<th>F-T Knowledge Workers</th>
<th>F-T Other Workers</th>
<th>P-T Workers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predicted wage of Non-participants</td>
<td>-0.0472</td>
<td>-0.0172</td>
<td>-0.0051</td>
</tr>
<tr>
<td>F-T knowledge workers</td>
<td>0.1193</td>
<td>-0.1175</td>
<td>-0.0547</td>
</tr>
<tr>
<td>F-T other workers</td>
<td>-0.0175</td>
<td>0.1473</td>
<td>-0.0127</td>
</tr>
<tr>
<td>P-T workers</td>
<td>-0.0347</td>
<td>-0.0127</td>
<td>0.0524</td>
</tr>
</tbody>
</table>

Note: The estimated marginal effects on the variable "White" need to be treated with caution, since in addition to having a direct effect on career path choice, this variable has an indirect effect through its impact on the predicted wage (see text). The symmetric matrix of scale factors by which the coefficients in Table 3 should be multiplied in order to evaluate marginal effects is given by $A$ where

$$A = \begin{bmatrix} 0.082 & -0.056 & 0.236 \\ -0.020 & -0.139 & 0.175 \\ -0.006 & -0.041 & 0.015 & 0.062 \end{bmatrix}$$

In order to conduct each of these experiments, a four stage procedure must be conducted. First, the existing coefficients of the reduced multinomial logit selector equation are used along with the assumed (post-shock) schooling data and the existing values of all other variables in order to evaluate the set of sample selection terms ($\lambda$). Second, the assumed data for the shock variable, the outturn data for all other variables, and the $\lambda$ form a vector of determinants of earnings in each regime, this vector is multiplied by the coefficients vector from each of the earnings equations in order to evaluate new estimates of earnings in each regime. Third, predicted earnings, the assumed post-shock data, and the outturn data for unaffected variables form a vector which, when multiplied by the vector of coefficients from the mixed discrete choice multinomial logit structural model of career path choice, can be used to evaluate a set of predicted probabilities. Finally, the career path which is chosen with maximum probability for each respondent is identified as the predicted path for each individual, and from this can be determined straightforwardly the distribution of women across career path regimes in the wake of the assumed shock.

The results of this exercise are reported in Table 5. In comparison with the predicted distribution of respondents across career paths in the absence of any shock, extra schooling reduces the incidence of non-participation slightly. It also reduces the number of women entering full-time employment other than as knowledge workers. The compensating increase in participation, however, all takes the form of an increase in the number of workers entering part-time employment, numbers of full-time knowledge workers do not change at all. The reason for this is that part-time workers appear to enjoy a somewhat higher rate of return to education than do full-time workers. As in the case of Blank (1990), this last finding contradicts the belief that part-time workers receive a lower rate of return than do full-time workers on their educational investments.

10 Where the shock takes the form of an increase in the number of children, data for two other variables — number of children squared, and low income * number of children — must also be amended.
Childbearing also has an effect on participation which accords with intuition. Non-participation and (especially) part-time work both increase, while the incidence of full-time work falls. In neither instance — increased schooling or increased fertility — is the impact on career path choice particularly dramatic, however. As explanations for the changes in the structure of female labour market participation, education and childbearing patterns are likely to have been less important than changes in industrial structure or in the technology underlying women's work choices.

4. Conclusions

A number of conclusions emerge from the above analysis. First, expectations of earnings affect women's choice of career path, including decisions such as labour market participation, the part-time versus full-time decision, and occupational choice. Second, private rates of return to adult education appear to be high, at least for those women working in full-time jobs. Third, the relationship between household income and female labour participation is somewhat more complicated than previous studies have implied. Different levels of household income generate different labour market responses. Fourth, the same is true of childrearing, while previous studies have suggested a simple linear link between childrearing and participation, the results presented above imply that the relationship between these two variables is non-linear, and it varies across income groups in a systematic fashion. Finally, the importance of correcting for endogeneity and sample selection biases in the problem of earnings determination and career choice has been established.

The task facing researchers of labour supply decisions remains substantial. Endogeneity issues remain which have not yet been tackled, for instance the potential simultaneity between numbers of offspring and income, that between adult education and work, and that between actual and desired occupation and schooling. Moreover, the income effects identified in the present study require further investigation. These issues will form the subject of future work.

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The Demand for Secondary Schooling

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Research School of Social Sciences
Australian National University

The most striking change in educational participation has occurred in the later years of secondary schooling. The year 12 retention rate has more than doubled since the beginning of the 1980s (Figure 1). Changes in participation in secondary schooling are of particular interest because they can be attributed almost totally to a change in the demand for education. Unlike the supply of places at tertiary institutions the supply of secondary schooling can be taken to be perfectly elastic.

Figure 1: Apparent Year 12 Retention Rate (Per Cent)

Source: Department of Employment, Education and Training (1993) and supplement (1994)

Economic theory suggests that the demand for secondary schooling depends on the returns from undertaking schooling relative to the costs. Simple human capital models argue that individuals choose their level of schooling in order to maximise the net present value of earnings. In a world of full employment the returns are calculated simply from average wages of individuals with different levels of education while the costs depend on direct costs of education plus the value of forgone earnings.

The world is rather more complicated in practice. First, wages depend on other factors than the level of schooling; ability and on the job training, for example. Second, there is no guarantee of a job because labour markets do not always clear. Hence, the probability of obtaining a job should enter the rate of return calculations.

The factors entering the cost side of the decision are equally complicated. The direct costs depend upon the school an individual chooses. The indirect cost to an individual depends upon a range of factors including the difficulty of obtaining a job rather than staying at school, the level of income support.

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1 This paper is a condensed version of Karmel (1995).

2 The supply of places at government schools is perfectly elastic because the government guarantees a place to any young person wishing to complete secondary school. Of course, the types of schooling may change, making it more or less attractive for students to stay at school.
available from government, the possibility of working part-time, the level of parental support and the consumption value of the education.

The approach that we take in this paper is to see the extent to which changes in school retention are related to factors which are likely to affect costs and returns. First, we look at changes in the returns from staying at school by considering movements in relative earnings. We also consider the demand shifts implied by changes in relative earnings in the face of very large increases in education levels. We then turn to full-time employment opportunities for teenagers. In Section 3 we look at movements in the income support (government allowances and part-time work) available to young persons who stay at school. Finally, we report the results of a regression analysis which brings together the factors considered earlier.

1 Changes in the Return From Staying at School

Changes to relative earnings

In Table 1 we present annual earnings (full-time, full-year workers) for males and females relative to an individual leaving school at 14 or 15 which, broadly speaking, can be taken to correspond to leaving at year 10. For both males and females, there was some decline in the return to continuing education relative to leaving school at the age of 14 or 15 between 1968-69 and 1981-82. Subsequently, the return increased so that the return over the later 1980s was similar to that for the 1970s. A similar pattern is seen for the return relative to leaving school aged 16 (Karmel 1995).

<table>
<thead>
<tr>
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<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Males</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At age 15-24</td>
<td>1.18</td>
<td>1.16</td>
<td>1.25</td>
<td>1.17</td>
<td>1.18</td>
<td>1.24</td>
</tr>
<tr>
<td>At age 25-34</td>
<td>1.29</td>
<td>1.23</td>
<td>1.16</td>
<td>1.16</td>
<td>1.17</td>
<td>1.19</td>
</tr>
<tr>
<td>At age 35-44</td>
<td>1.35</td>
<td>1.33</td>
<td>1.28</td>
<td>1.23</td>
<td>1.26</td>
<td>1.31</td>
</tr>
<tr>
<td>At age 45-54</td>
<td>1.39</td>
<td>1.28</td>
<td>1.28</td>
<td>1.25</td>
<td>1.30</td>
<td>1.33</td>
</tr>
<tr>
<td>At age 55+</td>
<td>1.39</td>
<td>1.29</td>
<td>1.34</td>
<td>1.23</td>
<td>1.48</td>
<td>1.30</td>
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<tr>
<td>All ages</td>
<td>1.30</td>
<td>1.24</td>
<td>1.23</td>
<td>1.19</td>
<td>1.24</td>
<td>1.25</td>
</tr>
<tr>
<td><strong>Females</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At age 15-24</td>
<td>1.24</td>
<td>1.20</td>
<td>1.19</td>
<td>1.18</td>
<td>1.23</td>
<td>1.22</td>
</tr>
<tr>
<td>At age 25-34</td>
<td>1.20</td>
<td>1.31</td>
<td>1.26</td>
<td>1.18</td>
<td>1.28</td>
<td>1.29</td>
</tr>
<tr>
<td>At age 35-44</td>
<td>1.41</td>
<td>1.30</td>
<td>1.32</td>
<td>1.29</td>
<td>1.35</td>
<td>1.33</td>
</tr>
<tr>
<td>At age 45-54</td>
<td>1.26</td>
<td>1.34</td>
<td>1.23</td>
<td>1.16</td>
<td>1.35</td>
<td>1.39</td>
</tr>
<tr>
<td>At age 55+</td>
<td>1.51</td>
<td>1.24</td>
<td>1.39</td>
<td>1.38</td>
<td>1.46</td>
<td>1.16</td>
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<tr>
<td>All ages</td>
<td>1.25</td>
<td>1.23</td>
<td>1.23</td>
<td>1.19</td>
<td>1.27</td>
<td>1.26</td>
</tr>
</tbody>
</table>

Table 1: Average Earnings of Full-Time, Full-Year Workers Relative to an Individual Leaving School at 14 or 15, Assuming Continuation in Education

Source Australian Bureau of Statistics, Income Surveys

3 This discussion has been couched in terms of an individual choosing whether to stay at school. In practice, parents have a large, if not dominant, influence on this decision. This does not change the argument, presumably, parents are interested in the welfare of their children.

4 Strictly speaking we are interested in the return from staying at school, some persons with tertiary qualifications may have left school at 14 or 15.
Demand Shifts

The stability of relative earnings in the face of large increases in education levels suggests the possibility of large changes in labour demand. If labour demand shifts away from those with low levels of education then increases in school retention are to be expected. We model the demand for persons who did not complete school relative to those with higher levels of educational attainment, using the changes in relative earnings discussed earlier.

Following Katz and Murphy (1992) we estimate the demand shift between these two groups using the relationship

\[
\hat{D} = \left( \frac{1}{1 + \rho} \right) \frac{\hat{w}_1}{\hat{w}_2} + \frac{\hat{L}_1}{\hat{L}_2}
\]

(1)

where \( \hat{D} \) denotes the shift in labour demand between labour type 1 and labour type 2, \( \hat{w}_1/\hat{w}_2 \) the relative earnings, \( \hat{L}_1/\hat{L}_2 \) the relative quantities of labour, \( 1/(1+\rho) \) the elasticity of substitution and \( \hat{\cdot} \) indicates percentage change.

Estimates based on this methodology, using an elasticity of substitution of one, are reported in Table 2 for the entire period 1968-69 to 1989-90. The left hand panel decomposes changes in the average demand of persons whose level of educational attainment is higher than 'left school at 14 or 15 years' relative to the earnings of persons whose highest level of educational attainment is 'left school at 14 or 15 years'. The right hand panel gives the analogous decomposition using 'left school at 16 years' as the benchmark.

A number of points emerge from this table. First, there has been a very substantial shift in demand toward persons who have completed school or have a post-school qualification. This shift in demand appears to be greatest among the younger age groups. Second, the group that has been particularly affected consists of persons who left school at 14 or 15. Third, the shifts are greater for women than for men.

To establish whether shifts in demand have affected school retention we need to compare our results with movements in the retention rates. First, we would expect the year 10 to year 11 grade progression rates to have increased more than the grade 11 to grade 12 rates on the basis that the demand shifts have been most unfavourable to those who left school aged 14 or 15. Second, we would expect the grade progression rates for women to have increased more than for men. Both of these predictions are borne out by the retention data.

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5 The relationship assumes that the economy can be characterised by a CES production function with multiple types of labour and that factor inputs are paid their marginal products.

6 The results are not sensitive to the value taken by the elasticity of substitution.

7 Karmel (1995) examines movements in grade progression rates which make up the year 12 retention rate. The year 10 to year 11 rate has increased more than the year 11 to year 12 rate for both males and females.
Table 2: Decomposition of Changes in Demand, 1968-69 to 1989-90 (Per Cent)

<table>
<thead>
<tr>
<th></th>
<th>Education better than leaving school at 14 or 15</th>
<th></th>
<th>Education better than leaving school at 16</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Change in (relative to leaving school at 14 or 15)</td>
<td></td>
<td>Change in (relative to leaving school at 16)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Earnings</td>
<td>Quantities</td>
<td>Residual demand</td>
<td>Earnings</td>
</tr>
<tr>
<td>Males</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-24 years</td>
<td>4.6</td>
<td>163.0</td>
<td>167.6</td>
<td>0.6</td>
</tr>
<tr>
<td>25-34 years</td>
<td>-7.9</td>
<td>159.3</td>
<td>151.4</td>
<td>-1.6</td>
</tr>
<tr>
<td>35-44 years</td>
<td>-2.7</td>
<td>158.7</td>
<td>156.2</td>
<td>-2.9</td>
</tr>
<tr>
<td>45-54 years</td>
<td>-4.5</td>
<td>115.5</td>
<td>111.0</td>
<td>5.8</td>
</tr>
<tr>
<td>55+ years</td>
<td>-6.2</td>
<td>85.2</td>
<td>79.0</td>
<td>-25.3</td>
</tr>
<tr>
<td>Total</td>
<td>-3.7</td>
<td>139.8</td>
<td>136.1</td>
<td>-6.5</td>
</tr>
<tr>
<td>Females</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-24 years</td>
<td>-1.9</td>
<td>177.9</td>
<td>176.0</td>
<td>-10.1</td>
</tr>
<tr>
<td>25-34 years</td>
<td>7.1</td>
<td>215.6</td>
<td>222.7</td>
<td>5.9</td>
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<tr>
<td>35-44 years</td>
<td>-5.4</td>
<td>163.9</td>
<td>158.5</td>
<td>3.9</td>
</tr>
<tr>
<td>45-54 years</td>
<td>10.1</td>
<td>80.1</td>
<td>90.2</td>
<td>6.2</td>
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<tr>
<td>55+ years</td>
<td>-26.1</td>
<td>40.1</td>
<td>14.0</td>
<td>-2.1</td>
</tr>
<tr>
<td>Total</td>
<td>1.3</td>
<td>140.5</td>
<td>141.9</td>
<td>-7.2</td>
</tr>
</tbody>
</table>

Source: Australian Bureau of Statistics, Income Surveys

However, an examination of the timing of increases in retention and shifts in demand suggests no obvious link. Additional factors are needed to explain the way in which the grade progression rates have changed over time.

2. Teenage Employment Opportunities

In evaluating the value of education as an investment the most important cost is forgone earnings. Variations in average earnings of young persons could conceivably influence the decision to stay at school. However, in the Australian labour market availability of jobs has varied much more and is a much more plausible explanation for the increase in schooling. Certainly a popular conception has been that many teenagers are staying at school because of the difficulty of finding a job (Sweet 1992).

Employment opportunities cannot be measured directly by looking at the number of teenagers in full-time jobs because the direction of causality is unclear. If teenagers stay at school longer then the reduction in the teenage labour supply will reduce the number of teenagers in employment. Consequently we need to get some indicators of demand for teenage workers which are external to teenagers.

We also considered whether changes in relative probabilities of employment, which will affect the return to education, were a possible factor behind increases in school retention. Most variation in the relative probabilities of having a job is cyclical, although there is some evidence that changes in relatities may have provided increased incentives during the 1980s to stay on at school.
We construct an index which incorporates three components:

- **Occupational structure**: If teenagers are concentrated in occupations which are declining in importance then this would suggest that the aggregate demand for teenage labour has fallen.

- **Cohort size**: Members of large cohorts may have difficulty finding a job relative to members of small cohorts (Wachter and Wascher 1984, 1991). It has also been argued that cohort size will affect educational choice through its impact on the rate of return to education (for example, Dooley and Gottschalk 1984, Alsalam 1985a, Stapleton and Young 1988, Falaris and Peters 1991, 1992, Flinn 1993)\(^9\), and

- **Supply pressures from other groups**: Changes in the labour supply of demographic groups which compete for jobs with teenagers are likely to affect the job prospects of teenagers.

The index is defined in the Appendix and presented in Figure 2. It can be thought of as the growth in jobs that teenagers could 'expect' to get relative to the growth in their population. The 'expectation' is formed on the basis of changes to the occupational structure, change in cohort size and changes to the labour supply of other groups.

**Figure 2:** Full-Time Employment Opportunities for Teenagers, Taking into Account Changes in Occupational Structure and Labour Supply Changes of Other Groups

![Figure 2: Full-Time Employment Opportunities for Teenagers](image)


It provides clear evidence of a very substantial decline in full-time employment opportunities for teenagers. The major factor behind the decline is that the labour forces of other demographic groups have grown faster than overall full-time employment, thus putting pressure on teenage job opportunities. This factor has been large enough to offset the favourable occupational change for females \(^10\). The other feature of the index is its behaviour in the recessions of 1982-83 and the early 1990s. At each of these recessions the index declined. This is what would be expected but the interesting thing is that the index did not recover between the recessions. One possibility is that the job growth after the recession has

---


\(^10\) A version of the index focusing on changes in occupational structure indicates a decline in opportunities for teenage males but an increase for females (Karmel 1995).
drawn in persons from outside the labour force who have consequently reduced opportunities for teenagers. Thus teenagers are affected by both the recessions and shocks generated by the recessions.

Changes in the Availability of Apprenticeships

Apprenticeships have been an important alternative to the completion of school for many boys and a smaller number of girls. One possible reason behind the increase in school retention is a reduction in the availability of apprenticeships. To test this possibility, in Figure 3 we plot apprenticeship commencements as a proportion of the 15 to 19 year old male population.\(^\text{11}\)

Figure 3: Apprenticeship Commencements as a Proportion of 15-19 Year Old Males

Source: Apprenticeship commencements supplied by the National Centre for Vocational Education Research Ltd.

The main feature of the figure is the pronounced downturns that correspond to the recessions of 1982-83 and 1991-92. Apart from these downturns there are no longer term trends to suggest that the availability of apprenticeships has been a factor behind the increase in retention. Indeed, there was strong growth in apprenticeship commencements in the late 1980s, a period in which school retention increased substantially.

Cyclical factors

The majority of the discussion in this section has been couched in terms of longer-term structural factors that might impact on the employment opportunities.\(^\text{12}\) Cyclical factors are also likely to be important. Certainly, it appears to be conventional wisdom that a reason behind the increase in retention has been high rates of unemployment. While the attractiveness of remaining in school will be higher when employment prospects are very poor (because expected forgone earnings will be low) a casual

\(^{11}\) It would be preferable to split apprenticeship commencements by gender. However, these data are not available in an extended time series. In 1992-93, 39,085 males and 7,005 females commenced apprenticeships (National Centre for Vocational Education Research Ltd, Annual Apprenticeship Statistics).

\(^{12}\) It should be noted that the employment opportunity indexes discussed above incorporate cyclical factors to the extent that the business cycle affects growth in overall employment, the occupational structure and labour force participation.
examination of the pattern of changes in school progression rates does not indicate any obvious cyclical pattern. School retention may have gone up in 1983 and the early 1990s when labour market prospects were very poor, but it also increased in the late 1980s when labour market prospects were relatively strong. This suggests that cyclical factors have not influenced school retention in any simple minded way.

3. Income Support

One factor which affects the decision whether to stay at school is the level of income support available if the person stays at school. Possible sources are support provided by government and the availability of part-time work.

*Government Allowances*

One of the difficulties of assessing the influence of these schemes on school participation is that they provide different incentives depending on the characteristics of the individual. However, if they have any effect it is likely to be on students from the most disadvantaged groups for whom additional income support is important. On this basis, the maximum allowance paid would appear to be the most relevant parameter although not all individuals would receive it if they stayed at school.

Figure 4 shows the real value of the maximum amount under these schemes since 1966. While the allowance did increase in the 1980s it would appear to be unlikely that the increase in progression rates can be attributed to it. The increase in school retention both preceded the increases that occurred in 1986 and continued to occur after 1988 when the major increase in the allowance ceased. Chapman (1992, p 66), in his review of the AUSTUDY program argues there is no strong evidence for the view that Australian secondary student income support schemes by themselves had a substantial impact on education participation rates up to 1989-90.

---

13 The level of parental support is also likely to be important. Following Pissandes (1981) we looked at the growth of permanent income, measured by real per capita private consumption expenditure. The growth in this variable has been steady apart from cyclical slowdowns and in no way explains the rapid increases in retention which occurred in the 1980s but not the 1970s. McGavon (1982) uses real average weekly adult male earnings as a measure of the resources available to families. This ignores the contribution of female earnings.

14 Since 1964 government income support has gone through various guises: the Commonwealth Secondary Scholarship Scheme, Commonwealth Senior Secondary Scholarship Scheme, the Secondary Allowance Scheme, AUSTUDY.
Part-Time Work

Another factor which might have affected the attractiveness of remaining at school is the availability of part-time work (Gregory and Duncan 1980). Figure 5 shows that the proportion of 15-19 year-olds at school who were working part-time has increased very substantially since the middle 1960s. The increase began in the early 1970s and has continued more or less ever since. Interestingly, the proportion of females working part-time was less than the proportion of males at the beginning of the period but the opposite has been true since the late 1970s. Female school retention has followed a similar pattern.\footnote{Of course the proportion of students working part-time reflects a combination of supply and demand factors. While the increase in the proportion may reflect the availability of work (that is, there has been an increase in the demand for part-time workers) it may also reflect supply factors. It may be the case that students have changed their tastes in respect of working part-time or that there has been a change in composition of the student body.}

Source: Data supplied by the Department of Employment, Education and Training

Source: Australian Bureau of Statistics, *The Labour Force, Australia*
4. **A Model of Grade Progression Rates**

The above discussion has not unearthed any one factor which obviously explains the precise pattern of the increases in grade progression rates we have observed. Factors likely to have had an effect include the cyclical state of the labour market, changes in relative earnings, shifts in demand away from individuals with low levels of schooling, the availability of full-time jobs for teenagers and the level of income support provided to those who continue at school. In this section we bring together these factors more formally. We also include cohort size because of the attention it has received in the literature. We do not include apprenticeship commencements, they showed no long term trend which potentially could explain the changes in retention we have seen, while cyclical aspects are already covered.

The dependent variables we use are the apparent grade progression rates from year 10 to year 11 and from year 11 to year 12, respectively, and for males and females separately.

- lagged dependent variables which we take to represent peer influences,
- cyclical employment opportunities. We also include a change in unemployment rate interacted with its sign. This allows for the possibility that school retention will increase when the labour market deteriorates but not *vice versa*,
- income assistance variables. We use the maximum government allowance (for those living at home) for 16 or 17 year olds and the proportion of teenagers at school in part-time work (separately for males and females),
- full-time employment opportunities for teenagers, as in Figure 2,
- changes in relative earnings,
- shifts in demand, and
- cohort size.

A problem encountered in modelling the grade progression rates is that a number of the independent variables are highly correlated. The correlations between the level of demand variable, the teenage employment opportunity index, the proportion of school students working part-time and the maximum student allowance all exceed (absolutely) 0.77 (within males and females, respectively). This makes the coefficients on these variables unstable. This problem of multicollinearity is handled by obtaining the first principal component of the relevant variables, calculated separately for males and females. Thus changes in the structure of demand, full-time employment opportunities for teenagers and income support are subsumed by one structural variable which represents, in some sense, long term changes in the environment faced by teenagers.

---

16 We choose to model grade progression rates because they better capture the nature of the decision making process than year 12 retention rates

17 We use the unemployment rates for all males (females) rather than the unemployment rates for teenagers in order to avoid the endogeneity which would be associated with the latter

18 We follow Wachter and Wascher (1984) and define two indexes. The first is the ratio of the size of younger cohorts to the cohort of 16 (17) year olds and the second is the ratio of the size of older cohorts to the cohort of 16 (17) year olds. This allows the effect of a demographic downswing to be different from that of an upswing. See Karmel (1995) for details.
Following Pissarides (1981), Forster and Ryan (1986) and Whitfield and Wilson (1991) we use a logistic transformation in order to constrain the predictions under the model to be between 0 and 1. The results, using weighted least squares, are given in Table 3. The variables which are significant in all four models are the lagged progression rate and the increase in the unemployment rate. The importance of unemployment in influencing school retention is not surprising. It certainly has been a popular view that high rates of unemployment have been an important factor behind recent increases in school retention and a number of authors have found 'discouraged worker' effects. Merrilees (1981), Mattila (1982), Raffe (1987) and Raffe and Wills (1989) all find that the state of the labour market affects school retention. Our results suggest that the changes in the labour market may have an asymmetric effect, with downturns having a larger effect than upturns. Although the test of equality of coefficients on the increase and decrease in unemployment is accepted, the increase coefficient is significant while the decrease coefficient is insignificant in each equation.

Additionally, in each equation the point estimates are larger for an increase than for a decrease. This finding, together with the importance of the lagged dependent variable, suggests that school retention of a cohort is dependent on the experience of earlier cohorts. Consequently, grade progression rates tend to ratchet up. A reason behind this may be the social environment at the time which saw education as being 'a good thing'. Chapman (1992) refers to a range of government policies, specifically as set out in Priority One (Office of Youth Affairs, 1986), which were aimed at lifting the proportions of teenagers staying at school. Another possible reason is that employers may use schooling as a screen, in which case cohorts would be disadvantaged if they have schooling levels lower than those preceding them.

The structural variables are positive in all models, but significant in only the year 11 to 12 models. It is difficult to interpret this variable since it is a composite of highly correlated variables. All that we can really say is that there have been important changes in the environment faced by teenagers and that these changes have been conducive to increases in school retention.

19 While the results of the regressions appear quite sensible, the models may not be particularly robust. A Chow test is used to test for stability over time (Greene 1993, p 211). The data are broken into the periods 1969 to 1981 and 1982 to 1993. The null hypothesis of no structural break is accepted in three out of four of the models at the five per cent significance level. However, at the 99 per cent level the null hypothesis is accepted in all of the models.

20 There was a contrary view around in the early 1980s which held that poor labour market conditions led to a fall in school retention. For example, the Commonwealth Tertiary Education Commission (1982) put forward the proposition that high levels of unemployment encouraged the more able students to leave school to search for a job.

21 A positive sign on the decrease in the unemployment rate is expected because decreases enter with a negative sign.

22 The coefficient for the male year 11 to year 12 model is significant at the 95 per cent level based on a one tailed test.

23 In fact a simple time trend fits the data as well as the constructed variable in a number of the models.
Table 3: Results of Logistic Regression Models of Grade Progression Rates (1969 to 1993)\(^a\)

<table>
<thead>
<tr>
<th></th>
<th>Grade 10 to 11 progression rate</th>
<th>Grade 11 to 12 progression rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Males</td>
<td>Females</td>
</tr>
<tr>
<td>Adj R(^2)</td>
<td>0.98</td>
<td>0.99</td>
</tr>
<tr>
<td>Coef</td>
<td>SE</td>
<td>Coef</td>
</tr>
<tr>
<td>Lagged progression rate(^a)</td>
<td>4.414 0.632</td>
<td>5.436 1.173</td>
</tr>
<tr>
<td>Unemployment rate(^b)</td>
<td>0.010 0.012</td>
<td>-0.035 0.011</td>
</tr>
<tr>
<td>Increase in unemployment rate(^b)</td>
<td>0.071 0.020</td>
<td>0.069 0.021</td>
</tr>
<tr>
<td>Decrease in unemployment rate(^a)</td>
<td>0.046 0.043</td>
<td>0.047 0.040</td>
</tr>
<tr>
<td>Structural variables(^b,c)</td>
<td>0.039 0.045</td>
<td>0.032 0.075</td>
</tr>
<tr>
<td>Relative earnings(^b,c)</td>
<td>1.764 0.852</td>
<td>0.749 0.821</td>
</tr>
<tr>
<td>Relative size of younger cohorts(^c)</td>
<td>0.214 0.566</td>
<td>0.050 0.428</td>
</tr>
<tr>
<td>Relative size of older cohorts(^c)</td>
<td>0.398 0.401</td>
<td>0.904 0.491</td>
</tr>
<tr>
<td>Constant</td>
<td>-5.058 1.091</td>
<td>-4.451 1.234</td>
</tr>
</tbody>
</table>

Tests of restrictions

<table>
<thead>
<tr>
<th></th>
<th>Unemp change is symmetric, F(1,16)(^d)</th>
<th>Cohort effect is symmetric, F(1,16)(^d)</th>
<th>Cohort effect is zero, F(2,16)(^e)</th>
<th>Chow test F(9,7)(^f)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coef</td>
<td>0.21</td>
<td>1.60</td>
<td>0.57</td>
<td>3.436</td>
</tr>
<tr>
<td>SE</td>
<td>0.17</td>
<td>0.67</td>
<td>1.72</td>
<td>4.31</td>
</tr>
<tr>
<td>Coef</td>
<td>0.14</td>
<td>0.67</td>
<td>0.97</td>
<td>3.31</td>
</tr>
<tr>
<td>SE</td>
<td>0.14</td>
<td>0.26</td>
<td>0.25</td>
<td>1.70</td>
</tr>
</tbody>
</table>

Notes: (a) This variable is the lagged progression rate, not the lag of the log odds ratio (b) Defined by gender (c) Defined by age (d) The 5 per cent significance level is 4.49 (e) The 5 per cent significance levels is 3.63 (f) The 5 per cent significance levels is 3.68 (g) Bold coefficients are significant at the 5 per cent level

The relative earnings variable we tested is the relative earnings of individuals, depending on whether they left school or not at year 10 (the year 10 to year 11 model) or year 11 (the year 11 to year 12 model). The coefficients on these variables are all positive, as would be expected, but prove to be significant only in one of the models.\(^24\)

\(^24\) While a number of authors have found that the expected return to education is a determinant of school retention (Pissarides 1981, Mattila 1982, Whitfield and Wilson 1991) it is not surprising that our results are weak. The method of construction of the data series and its limited variability make it unlikely that we would find that changes in relative earnings are an important factor.
The coefficients on the cohort size variables are all positive but all insignificant. The joint effect is also insignificant.  

As a final comment it is worth considering what the models imply for future school completion rates. The models suggest that there is little likelihood of the grade progression rates declining substantially. While there is nothing in the models to prevent the rates declining to an equilibrium level, the structure of the models indicates that it is more likely that retention rates will tend to go up rather than down. There are two reasons for this. First, there is the asymmetric effect of unemployment. We do not expect a reduction in unemployment to result in a drop in school retention as large as the increase caused by the rises in unemployment. Second, there is no reason to believe that the trends observed in the environment faced by teenagers as measured by the structural variables are likely to change.  

5. Conclusion  

In this paper we have compiled a range of evidence of possible economic influences on the demand for the final years of secondary school education. The broad conclusion is that a large number of economic factors have tended to drive school retention up.  

The factors can be divided into three broad areas. First, the structure of labour demand has changed in a way which encourages school retention. The demand for persons with low levels of educational attainment has declined, as have the full-time employment opportunities for teenagers.  

Second, the increase in government student allowances in the mid-1980s and the long-term increase in the availability of part-time jobs for students have encouraged school retention by reducing the cost of staying at school for part of the student group.  

Third, the increase in the level of unemployment appears to have played an important role in the increases in retention during the 1980s. This is to be expected because the opportunity cost of staying at school will be reduced by increases in the probability of being unemployed. However, improvements in the labour market do not appear to have had the opposite effect. Indeed, the structure of a model of grade progression rates suggests that once the rates go up it is difficult for them to go down. This could be a result of individuals 'following the herd', perhaps because employers use schooling as a screen, and increasing pressure on individuals from parents and governments to complete secondary school.  

It also appears that school retention is unlikely to fall significantly in the future. This is because a reduction in unemployment has a smaller effect on retention than an increase in unemployment and there is no reason to believe that the trends observed in the economic environment faced by teenagers are likely to be reversed.  

25 Falaris and Peters (1992) note that the patterns observed in the United States are more complex than predicted by theory and that short term timing considerations seem to be dominated by more long term factors. Finn (1993) also finds that the response of schooling to cohort size is small. Forster and Ryan (1986), employing a joint time series cross-section approach (with observations for each Australian State) find significant cohort effects for the relatively short period 1968-83. However, their results differ from those found in the United States and also are not consistent across age groups. Given these findings it is not surprising that we find cohort size to be an unimportant factor behind the large increases in retention we have seen.  

26 Figure 1 shows that the apparent year 12 retention rate peaked in 1992. Recent data (not included in the regression analysis) indicates a further fall in 1994 to 74.6 per cent from 76.6 in 1993 and 77.1 in 1992 (Australian Bureau of Statistics, 1995).
Appendix. Index of Full-Time Employment Opportunities for Teenagers.

Let $E_{jt}$ be employment in the $t$th occupation, $j$th demographic group at time $t$ and let $E_{jt}$ indicate a summation over the relevant subscript.

In each time period assume there will be $E_{jt}^*$ persons in the $j$th demographic group competing for a job. The bid for jobs in a particular occupation depends on the traditional share of jobs held by the group in the occupation. The share of the jobs which the group will actually get will depend on the size of bids of all the groups. If a demographic group's labour force is growing relatively quickly then it would be expected that the demographic group would increase its share of jobs.

That is, the $j$th demographic group would hope to obtain $w_j E_{jt}^*$ jobs in the $t$th occupation, where $w_j = E_j / E_j^*$ is the distribution of employment across occupations at some base period. Assuming that all groups are equally successful the total jobs obtained by the $j$th demographic group would be

$$\text{Jobs}_{jt} = \sum_i \left( \frac{w_j E_{jt}^*}{\sum_j w_j E_{jt}^*} \right) E_{jt},$$  \hspace{1cm} (2)

We rewrite $E_{jt}^*$ as $E_{jt}^* = E_{jt} \Delta_{jt}$, where $\Delta_{jt} = LF_{jt} / LF_{jt}$ for groups other than teenagers and $\Delta_{jt} = N_{jt} / N_{jt}$ for teenagers, where $LF$ represents the full-time labour force and $N$ represents the population. Then $w_j E_{jt}^* = E_{jt} \Delta_{jt}$.

Expressing the jobs that the $j$th demographic group could expect to get as a proportion of the corresponding population and dividing by the proportion of the $j$th group in full-time jobs in the base period gives

$$C_{jt} = \left( \frac{1}{N_{jt}} \right) \left( \sum_i \left( \frac{E_j \Delta_{jt}}{\sum_j E_j \Delta_{jt}} \right) \frac{E_{jt}}{E_j} \right) \left( \frac{E_{jt}}{N_{jt}} \right),$$  \hspace{1cm} (3)

The structure of the index is best explained by rewriting it as

$$C_{jt} = \left( \frac{\bar{E}_{jt}}{E_{jt}} \right) \left( \frac{N_{jt}}{N_{jt}} \right) \text{ where } \bar{E}_{jt} = \left( \sum_i \left( \frac{E_j \Delta_{jt}}{\sum_j E_j \Delta_{jt}} \right) E_{jt} \right),$$ \hspace{1cm} (4)

$\bar{E}_{jt}$ is the number of jobs the teenage group (denoted by $j'$) can 'expect' to get at time $t$ given employment growth by occupation and the increase in the full-time labour force of other demographic groups relative to the growth in the teenage population.
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Singoporean Demand for Education

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Murdoch University, Perth

Abstract

Singapore's record of economic growth is already impressive but it is gearing up for a new phase of economic growth in the 1990s. The movement away from a developing economy relying on cheap unskilled labour to one where greater emphasis is placed on high technology has created a greatly increased demand for education and training. Increasing affluence and awareness of the economic returns to education have also led to an increasing demand for education. This paper analyses trends in demand, future developments and the implications for Australia.

1. Introduction

Labour has always been a particularly important resource for Singapore. Apart from its location, the 'island state' has few natural resources, although the inflow of foreign capital over recent decades has to some extent overcome this deficiency. Industrialisation and structural change in the economy have had important impacts on the labour market. Singapore is unique in the extent to which corporatism has developed, providing a political structure largely independent of both capital and labour. Crucial to Singapore's economic development has been the role of the state, which, through the People's Action Party (PAP), permeates almost every aspect of Singapore society at economic, political and social levels (see Rodan 1989).

It is important to see labour market changes in the light of the government's attempts to restructure the economy away from low cost manufacturing towards a highly skilled economy and to reduce the reliance on the growth in labour supply — particularly of foreign workers. One aspect of this policy has been to raise wages deliberately in order to discourage employers from hiring low skilled labour, encourage substitution of capital for labour and increase investment in high technology equipment. The industrial relations structure is geared to providing the conditions for a compliant labour force while also guaranteeing minimum conditions for employees and preventing employers from making use of cheap, low-skilled labour.

The transformation from the 'third to the second economic league' has had implications for education and training. The demands by employers for more highly skilled labour has meant an expansion of the education system, particularly at the tertiary level, but also increased provision of on-the-job training. The expansion of education has been more than matched by the growth in demand for places due, in part, to the rewards education and training bring to the participants, but also due to the increased incomes available to families to finance participation in education.

In this paper, Section 1 describes the structure of, and trends in, the labour market, while Section 2 examines developments in education and training. The paper concentrates on the
demand for higher education (Section 3) since it is this aspect which is of greatest interest to Australia. The paper concludes with some discussion of likely developments and issues for the future.

2. Overview of the Singapore Labour Market

The structure of the Singapore labour market today and likely future developments are very much influenced by the policies pursued by the PAP, which has ruled Singapore since 1959. However, changes in the international economy have also shaped these policies. Up until 1968 Singapore's industrial strategy related mainly to import substitution. Education policy was concerned primarily with improving literacy and numeracy in order to attract basic manufacturing industries, plus expansion of technical education to provide the skills for the acceleration of industrialisation. A secondary aim was to provide a national identity and social cohesion among the disparate ethnic groups which make up the population. (For further details about Singapore's education policy see Low, Toh and Soon 1991)

From 1968 to 1979 economic policy focussed on increasing export orientation and on low value added manufacturing. Financial and other incentives provided to foreign capital were aimed at diversifying the economy and developing Singapore into an international financial centre. Another attraction for foreign investment was the, sometimes ruthless, maintenance of a compliant workforce.

Singapore's industrial relations system is based on a former Western Australian model and has the principles of arbitration and conciliation (see Gamba 1963). However, industrial disputes very rarely occur because the full power of the state is brought to bear on the system and there is a close relationship between the PAP and the peak union body, the National Trade Union Congress (NTUC). For an account of the Singapore industrial relations system see Anantaraman (1990). For a somewhat different perspective see Wilkinson and Leggett (1983) and Leggett (1991). The National Wages Council (NWC), a tripartite body consisting of government, employer and union representatives, was set up in 1972 to formulate wages policy. Although the wages decisions are not mandatory, the public sector has generally accepted the decisions fully and thus sets the pace for private employers.

Between 1972 and 1974, wages were deliberately raised to increase productivity. Education policy was concerned with developing the skilled labour required for economic development, proficiency in English, and the promotion of social cohesion. Between 1970 and 1978 employment grew substantially, with a small hiccup during the recession of 1974/75. Although productivity also grew, a considerable shortfall in labour supply meant that labour had to be imported, mainly from ASEAN countries.

In 1979, Singapore embarked on a strategy of developing high value-added industries, particularly those which were technology intensive. High wages were a deliberate part of government policy intended to encourage employers to make better use of scarce labour and improve the skills and productivity of the workforce. However, dependence on foreign labour continued. Incentives were provided for research and development to assist high technology industries. Education policy was largely geared to providing workers with the skills to facilitate this process.

Current labour market policies can be seen largely as an extension of those employed in the 1980s, but with even greater emphasis on improving the skills and productivity of the workforce. The central aim of government policy is to make Singapore the financial and business services centre for economic development in the region. A major step in this direction is the creation of the 'Growth Triangle' consisting of Singapore, Johor in Malaysia and various nearby islands.
but particularly Batam in Indonesia, with Singapore the centre for financial and highly skilled services. Of course, developments in the labour market are only a part of the government's strategy for economic growth in Singapore. A range of political and economic measures have been, and continue to be, used to facilitate the inflow of foreign capital.

**Demand for Labour**

The major changes in demand for labour by industry are shown in Table 1 below, which illustrates clearly the changing industrial structure in Singapore.

**Table 1: Employed Persons by Industry ('000)**

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, Fishing etc</td>
<td>22.5</td>
<td>17.4</td>
<td>17.1</td>
<td>8.1</td>
<td>0.6</td>
<td>-66.5</td>
<td>0.0</td>
</tr>
<tr>
<td>Mining and Quarrying</td>
<td>2.2</td>
<td>2.1</td>
<td>1.1</td>
<td>2.4</td>
<td>0.5</td>
<td>-54.6</td>
<td>0.0</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>143.1</td>
<td>218.1</td>
<td>324.1</td>
<td>293.8</td>
<td>421.9</td>
<td>30.2</td>
<td>28.4</td>
</tr>
<tr>
<td>Utilities</td>
<td>7.6</td>
<td>8.9</td>
<td>8.5</td>
<td>7.7</td>
<td>6.8</td>
<td>-0.2</td>
<td>0.5</td>
</tr>
<tr>
<td>Construction</td>
<td>43.1</td>
<td>39.2</td>
<td>72.3</td>
<td>102.8</td>
<td>134.4</td>
<td>85.9</td>
<td>9.1</td>
</tr>
<tr>
<td>Commerce</td>
<td>152.6</td>
<td>191.7</td>
<td>229.8</td>
<td>271.1</td>
<td>327.2</td>
<td>97.4</td>
<td>22.0</td>
</tr>
<tr>
<td>Transport &amp; Communication</td>
<td>7.9</td>
<td>9.79</td>
<td>11.99</td>
<td>11.70</td>
<td>14.00</td>
<td>16.8</td>
<td>9.4</td>
</tr>
<tr>
<td>Finance, Insurance etc</td>
<td>25.8</td>
<td>50.7</td>
<td>79.4</td>
<td>100.7</td>
<td>158.9</td>
<td>100.1</td>
<td>10.7</td>
</tr>
<tr>
<td>Other Services</td>
<td>174.6</td>
<td>204.6</td>
<td>224.6</td>
<td>248.3</td>
<td>290.3</td>
<td>29.5</td>
<td>19.6</td>
</tr>
<tr>
<td>Not Defined</td>
<td>0.4</td>
<td>2.5</td>
<td>0.4</td>
<td>2.4</td>
<td>0.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>650.9</td>
<td>833.5</td>
<td>1077.1</td>
<td>1154.2</td>
<td>1485.8</td>
<td>37.9</td>
<td>100.0</td>
</tr>
</tbody>
</table>

**Source:** *Singapore Yearbook of Statistics*, various years.

Between 1980 and 1990 total demand for labour rose by 38 per cent. This period saw the virtual disappearance of the already small primary sector. Although manufacturing still employs the largest proportion of workers, there has been large growth in commerce and in the finance and insurance industries. There were also big increases in employment in construction, to some extent to provide the infrastructure to facilitate growth in the other sectors, but also to increase and improve the housing stock. Perhaps more important than the distribution of jobs by industry is the changing structure of occupations. Figure 1 shows how the occupational structure changed in Singapore between 1980 and 1990.
Workers in the category "Production, Transport, etc" were by far the biggest group of workers in both years, but their proportion fell slightly between 1980 and 1990 despite the growth in manufacturing and construction. The largest growth has been among professional, technical and administrative workers. In 1980 they made up only 18 per cent of the workforce. In 1990 this proportion had risen to about 24 per cent. The changing structure of the Singapore economy has resulted in a substantial increase in the demand for skilled workers and particularly professionals. This has had obvious implications for the demand for education.

Supply of labour

In 1990 the total labour force in Singapore was just over 1.5 million. Of these, 38 per cent were female. According to official statistics Singapore citizens made up 90 per cent of the labour force. Overall only 13 per cent of the labour force was unemployed (Ministry of Labour 1990).

One of the most important sources of change in the supply of labour concerns the participation rate (see Figures 2 and 3). There are several main features of the data. First, the falling participation rate among 15-19 year olds of both sexes due to increased participation in education and training. Second, the rise in participation rates over time among women of all age groups except for the youngest age group. Third, for both periods the steep decline in the participation rate among older workers. Finally, the decline in the participation rate among older male workers over time compared to stability in the age groups 30-39 and 40-49 years.

The increased participation of women in the paid labour force is a phenomenon observed worldwide. The major reasons put forward are social, such as a change in women's perception of their role in the family and the workplace, and economic, such as increases in rates of pay relative to male workers. Lewis (1993a) has pointed out that, at almost all levels, pay differentials between males and females have fallen. In the professional, administration and clerical occupations differentials are the lowest. There has been a growing incentive for the female labour supply to increase.
Figure 2: Participation Rates for Males

Source: Population Census, 1980 and 1990

Figure 3: Participation Rates for Females

An important factor in increasing female labour supply in developed countries has been the growth in part-time work. Much of this has been demand driven due to peak load problems encountered by many of the service industries. Somewhat surprisingly part-time work is not common in Singapore. Only between 3 per cent and 10 per cent (depending on the definition) of the workforce are part-time workers (Ministry of Labour 1990). Employers have been reluctant to use part-time workers, but the NWC has recently put pressure on employers to employ more part-time workers (Straits Times, 30 May 1992).

Changes in fertility rates have also been an important factor in increasing female labour supply. In 1980 the birthrate among women under 25 years of age was 46 per thousand, whereas in 1990 it was 31 per thousand. In 1980 the fertility rate for women aged between 30 and 34 years of age was 118 per thousand compared to 161 per thousand in 1990. Thus, generally, women are having children at a later age than previously and thereby prolonging their participation in the labour force. Since 1987 there has been significant growth in the birth rate (Department of Statistics 1990) largely due to the government's attempt to redress the fall in the birth rate which occurred over much of the 1980s. The government has campaigned to encourage increases in births, particularly among the more highly educated, and child care facilities have grown. Increased incomes have also allowed women to afford private childminding facilities. Thus, the component of Singapore's labour supply arising from its native population will grow in the future, increasing the demand for education.

The decline in the participation rate with age simply reflects retirement decisions by older workers, but the falling participation rate over time for older workers indicates that workers are retiring earlier. The official retirement age is currently 55 but there is great pressure on employers to raise this to 60. By 1989 many collective agreements contained provisions for extended retirement and in 1992 the NWC announced specific measures to raise the retirement age to 60. Retirement is possible only if alternative sources of income to that from work are available. It is likely that the existence of the Central Provident Fund (CPF) is to a large extent responsible for this reduction in the participation rate for older workers.

The CPF was established in 1955 as a superannuation scheme, but it has since evolved into a comprehensive social security scheme whereby savings can be used for housing, medical bills and education. Both employers and employees contribute a percentage of a worker's wage into the worker's CPF account. Contributions are relatively high proportions of earnings (up to 50 per cent). The CPF has contributed significantly to Singapore's development as a source of national savings and has reduced potential public expenditure on social services, health and education. However, the effects on labour supply are now becoming apparent. Workers can withdraw CPF savings when they reach 55 years of age. Many workers retiring today would have been in the CPF scheme for over 35 years and would have amassed considerable savings. It is hardly surprising that many are choosing to take their savings and leisure in preference to work. The existence of CPF also has implications for the financing of education. These will be taken up later.

Foreign workers have always been an important source of labour supply in Singapore. In the 1980s foreign workers were mostly Thais, in the construction industry, and Filipinas, in domestic service (see Patarapanich, Wilkinson and Leggett 1987). Ministry of Labour statistics put the number of non-Singapore citizens in the labour force at about 150,000. However, these official statistics do not include the possibly large number of illegal foreign workers. Singapore has also drawn on the world labour market for highly skilled workers, including professionals. Although more recent data are hard to come by, a survey conducted in 1980 (Inland Revenue Department 1981) indicated that about 30 per cent of all graduates in Singapore were non-citizens. In 1989 Singapore turned to Hong Kong to help alleviate its shortage of highly skilled workers. Under a special scheme, migrants from Hong Kong who had at least five GCE 'O' levels and earned
over 1500 Singapore dollars per month could become permanent residents. The rules were later altered to allow others to settle. About 9500 people from Hong Kong have settled in Singapore since the immigration rules were relaxed.

Although much of Singapore's labour policies have concentrated on the inflow of foreign workers, the emigration of Singaporean citizens is of growing concern. For instance, the number of migrants from Singapore to Australia, the major destination, rose from under 500 per year in 1980 to almost 2000 per year in 1988. Probably of more concern than the absolute number of emigrants from Singapore is the composition of the flow. Sullivan and Gunasekeran (1991) compared the occupations of migrants from Singapore to Australia with the occupations of migrants from other countries in the region. They found that the people leaving Singapore were highly skilled relative to the Singapore labour force generally and also relative to other ASEAN emigrants to Australia. The degree and type of emigration is of some concern to the government, which has set up the Singapore International Foundation to forge links with Singaporeans overseas (Committee of Ministers of State 1990).

There has been a suspicion that the emigration of educated Singaporeans is linked to the growth in students studying overseas. Recent research (Dawkins et al. 1991) confirms this and suggests that the favourable perception of countries like Australia, Canada and the USA influences not just the students themselves but also family and friends.

3. Education and Training

The changes in the demand for labour require complementary changes in the skills of the workforce. This skills transformation is continuing at a fast pace. The Singaporean education system is to some extent based on the old English system and Figure 4 provides a simplified representation.

Kindergartens are largely provided by the government. The official government schools system starts with three years of primary school after which students are streamed according to language ability. Students passing the streaming examination (about 89 per cent in 1990) pursue the 'normal' course of three years (primary 4 to 6). There are extended courses for those who are less able in languages and for those who pursue a monolingual education (about 42 per cent). This latter group sit the Primary School Proficiency Examination (PSPE) and move on to vocational training at one of the institutes run by the Vocational and Industrial Training Board (VITB). Students from the other streams sit the Primary School Leaving Examination (PSLE). An elite group (0.5 per cent) enter the 'Gifted Program' at the beginning of Primary 4 where they receive special tuition.

On the basis of the PSLE results, students enter either the 'express' or 'normal' secondary school streams. Students in the normal stream (37.2 per cent) sit the General Certificate of Education (GCE) 'O' level examinations and, if successful, can go on to a further year of study for GCE 'A' level examinations which are sat by the specialist or express streams (62.7 per cent). Success at 'O' level examinations leads to study for GCE 'A' levels and qualification for tertiary education. At secondary level there is also an elite group of students (0.1 per cent) in the 'Gifted Program'.
Figure 4: The Singapore Education System

KINDERGARTEN

PRIMARY 1-3

PRIMARY 4-6

PSLE

PRIMARY 4-8

PSPE

SECONDARY

GCE 'O' or 'N' LEVELS

COLLEGE OR PRE UNIVERSITY

POLYTECHNIC

VITB

GCE 'A' LEVELS

UNIVERSITY SINGAPORE UNIVERSITY OVERSEAS

* To be abolished
Singapore currently has two universities, the National University of Singapore (NUS) and the Nanyang Technological University (NTU) which was a technological institute until July 1991. The Open University was due to start in 1994. There are three polytechnics, Singapore Polytechnic, Ngee Ann Polytechnic, Temasek Polytechnic and the National Polytechnic, which opened in July 1992. Students usually enter polytechnics after taking 'O' levels, but a good performance in a polytechnic can qualify a student for university entry, usually overseas because of the limited number of places in Singapore universities.

Formal education is only part of the skilling process. Training also takes place on-the-job and through short courses. The National Productivity Board (NPB), established in 1972, promotes productivity through training for management and workers. Many of the larger companies have skill development programs. One persistent problem encountered by firms providing more general training, however, is that the generally tight market conditions make job mobility (or "job hopping" as it is known) very high in Singapore. This suggests that the aggregate level of training would be much lower without government provision of training since employers do not reap the full benefits of private expenditure on training. Much of the vocational training is financed by employers’ contributions to the Skills Development Fund (SDF).

The Basic Education and Skills Training (BEST) program offers basic literacy and numeracy courses for workers with below secondary education. It is administered by the Vocational and Industrial Training Board (VITB) and attracts about 19,000 participants annually. Between 1983 and 1989, 127,000 persons enrolled in one or more of the four modules offered (Toh 1991). The other national adult worker training program is Worker Improvement through Secondary Education (WISE), also administered by the VITB. The Modular Skills Training Program (MOST) is for workers who lack basic skills, need new skills or wish to upgrade their present skills, it leads to a certification in an employable skill. Workers may either be sponsored by their employers, or the NTUC, or enrol on their own. The SDF reimburses 70 per cent of the course fee for sponsored workers. Since its inception, over 33,000 training places have been taken up with about 22 per cent sponsored by the NTUC or employers (Toh 1991).

In addition to these three schemes, the VITB has the Continuing Education and Training (CET) program to continuously train, upgrade or retrain workers in response to the development of new skills. For apprenticeship training the on-the-job component is provided by the employers while the VITB formulates the training program and supports the off-the-job training through full-time or CET programs.

The changes in demand for education have been quite disparate across different levels. Table 2 shows how participation in education has increased over time. Given the generally low birthrate the number of children in primary and secondary schools hardly changed between 1980 and 1990. However, the numbers in post-compulsory education more than doubled over the same period. Total expenditure on education by the public sector rose from $688 million in 1980 to $1,775 million in 1985 and to $2,108 million in 1990.
Table 2: Enrolment in Educational Institutions

<table>
<thead>
<tr>
<th></th>
<th>1980</th>
<th>1985</th>
<th>1990</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary schools</td>
<td>291,722</td>
<td>278,060</td>
<td>257,932</td>
</tr>
<tr>
<td>Secondary schools</td>
<td>156,491</td>
<td>164,168</td>
<td>161,029</td>
</tr>
<tr>
<td>Pre-university</td>
<td>17,202</td>
<td>26,160</td>
<td>30,430</td>
</tr>
<tr>
<td>Technical and vocational institutions</td>
<td>13,839</td>
<td>21,161</td>
<td>29,102</td>
</tr>
<tr>
<td>Tertiary institutions</td>
<td>22,633</td>
<td>39,913</td>
<td>55,562</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>501,887</td>
<td>529,462</td>
<td>534,055</td>
</tr>
</tbody>
</table>

Source: *Singapore Statistical Yearbook*, various years

4. The Market for University Education

Because of the huge excess demand for places in Singaporean universities strict quotas apply to all courses. These quotas are set with reference to the government's human resource management plans. The distribution of university students (Table 3) gives a clear indication of where Singapore's priorities lie. Over half of all male university undergraduates are enrolled in engineering. This reflects Singapore's commitment to providing the basis for high technology manufacturing plus growth in construction. Scientific and business related subjects come next in terms of student enrolments, comprising about 14 per cent of the total each. The highest proportion of female student enrolments, about a third, is in business related subjects, followed by arts and social sciences and then science.

Table 3: Enrolments in First Year Undergraduate Degree Courses in Singapore, 1990/91

<table>
<thead>
<tr>
<th></th>
<th>Males</th>
<th></th>
<th></th>
<th>Females</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Per cent</td>
<td>Number</td>
<td>Per cent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arts and social science</td>
<td>391</td>
<td>8.6</td>
<td>955</td>
<td>26.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Science</td>
<td>609</td>
<td>13.6</td>
<td>772</td>
<td>21.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medicine</td>
<td>100</td>
<td>2.2</td>
<td>50</td>
<td>1.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dentistry</td>
<td>25</td>
<td>0.6</td>
<td>9</td>
<td>0.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Law</td>
<td>91</td>
<td>2.0</td>
<td>108</td>
<td>3.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business administration</td>
<td>329</td>
<td>7.3</td>
<td>776</td>
<td>21.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Architecture</td>
<td>115</td>
<td>2.5</td>
<td>170</td>
<td>4.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engineering</td>
<td>2,341</td>
<td>51.9</td>
<td>326</td>
<td>8.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accountancy</td>
<td>318</td>
<td>7.0</td>
<td>415</td>
<td>11.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer technology</td>
<td>192</td>
<td>4.3</td>
<td>71</td>
<td>1.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>4,511</td>
<td>100.0</td>
<td>3,652</td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: *Singapore Yearbook of Statistics, 1990*
Although the number of places in post-school education has increased the demand for such places has grown at a faster rate. The excess demand for education is most obvious with respect to university education. In 1990 over 9,000 students were studying in universities overseas, which is over a third as many students as actually studying in Singapore. Another guide to the degree of excess demand for places is given by comparing the number of students qualifying for university entrance with first year enrolments. Smart and Ang (1992) calculated that, as a crude estimate, 11,000 students in 1990/91 reached the minimum requirements for admission to a university either in Singapore or overseas. This implied an excess demand for first year university places of about 3,500 per year or 10,500 places in total.

Data on Singapore students studying overseas is only obtainable from statistics collected by the host countries, some of which are compiled by UNESCO. Table 4 shows the major countries of destination to be the US, UK, Australia and Canada.

Table 4: Country of Destination of Singaporean Overseas Students, 1988

<table>
<thead>
<tr>
<th>Country</th>
<th>Number</th>
<th>Per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>3,869</td>
<td>41.27</td>
</tr>
<tr>
<td>UK</td>
<td>1,930</td>
<td>21.71</td>
</tr>
<tr>
<td>Australia</td>
<td>1,418</td>
<td>15.95</td>
</tr>
<tr>
<td>Canada</td>
<td>1,133</td>
<td>12.74</td>
</tr>
<tr>
<td>New Zealand</td>
<td>310</td>
<td>3.49</td>
</tr>
<tr>
<td>Japan</td>
<td>88</td>
<td>0.99</td>
</tr>
<tr>
<td>Ireland</td>
<td>35</td>
<td>0.39</td>
</tr>
<tr>
<td>Others</td>
<td>307</td>
<td>3.45</td>
</tr>
<tr>
<td>TOTAL</td>
<td>8,890</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: *UNESCO Yearbook, 1990*

Smart and Ang (1992) used interviews to investigate the factors determining the choice of country of study. They concluded that there are two main reasons for the popularity of the US. First, American universities provide much greater flexibility than, say, those in Australia or the UK. Foundation courses, fast-tracking summer schools, two (sometimes three) intakes a year and greater availability of course advice were examples of this flexibility. Easy visa access and, generally greater attention to marketing of the US as a place to study were secondary factors.

UK universities are highly regarded by Singaporeans and their degrees are considered more acceptable than other overseas degrees. However, the high cost of a UK degree in terms of fees and living expenses is a negative factor. No visa is required for studying in Britain.

Australia is not highly regarded with respect to academic standing, although an Australian degree is regarded as an acceptable qualification in Singapore. However, Australia is regarded as a ‘safe’ place to study with a warm climate and close to Singapore (particularly Perth which takes 50 per cent of Singaporean overseas students). Australia is considered to be a low-cost country, particularly given that overseas students can work up to 20 hours per week during term and full-time during vacation. This impression has been modified somewhat following the increase in fees since the late 1980s.
Apart from the country of destination of Singapore students there are relatively little data on overseas students with respect to such things as subject and level taught. The exception to this is the US which, fortunately, has a very high proportion (41 per cent) of all students from Singapore studying overseas. Every two years a survey is taken of all overseas students studying in the US. Table 5 shows the distribution of students by subject for the sample of respondents from Singapore.

Table 5: Singapore Students Surveyed by Field of Study, US, 1988

<table>
<thead>
<tr>
<th>Subject</th>
<th>Number</th>
<th>Per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural science</td>
<td>8</td>
<td>0.3</td>
</tr>
<tr>
<td>Education</td>
<td>57</td>
<td>2.2</td>
</tr>
<tr>
<td>Business and management</td>
<td>953</td>
<td>37.3</td>
</tr>
<tr>
<td>Social science</td>
<td>156</td>
<td>6.1</td>
</tr>
<tr>
<td>Humanities</td>
<td>59</td>
<td>2.3</td>
</tr>
<tr>
<td>Arts</td>
<td>141</td>
<td>5.3</td>
</tr>
<tr>
<td>Engineering</td>
<td>614</td>
<td>24.1</td>
</tr>
<tr>
<td>Mathematics and computing</td>
<td>277</td>
<td>10.9</td>
</tr>
<tr>
<td>Physical science</td>
<td>80</td>
<td>3.1</td>
</tr>
<tr>
<td>Health science</td>
<td>45</td>
<td>1.8</td>
</tr>
<tr>
<td>Other</td>
<td>162</td>
<td>6.3</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>2,552</strong>*</td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>


Note: * The surveyed total compares to the actual student population of 4,256

The survey indicated that business and administration courses (37.3 per cent) were the most popular followed by engineering (24.1 per cent). The survey also provided estimates of undergraduate (77 per cent) compared to postgraduate students (23 per cent). Unfortunately, there was no cross classification by subject and level of study.

Surprisingly, despite the importance of overseas students to the higher education sector in Australia, until recently there has been little information on the mix of Singapore students in Australia. However information is available for 1990 and this is shown in Table 6. Clearly, most students from Singapore are enrolled in business administration and economics courses (almost 60 per cent) with humanities and social sciences making up a significant proportion (15 per cent). Perhaps surprisingly, given the high proportion of Singapore students in the US undertaking engineering, a very small proportion (4.2 per cent) study engineering in Australia. Only a small proportion of the students are postgraduates (8 per cent) and of these a high proportion (37 per cent) are in business and economics.

The statistics for both the US and Australia suggest there is a very large excess demand for places at Singapore universities, particularly in the area of business and economics despite the high costs of an overseas degree. The annual fee alone for an economics degree in Australia in 1991 was $9,000, compared to the NUS fee of about $2,200 (S$2,600). This indicates that the extra financial rewards from a degree must be substantial. There has been little analysis of this question but what research exists suggests the rewards to education are large.
Table 6: Enrolments of Singapore Students Undertaking Higher Education Courses in Australia at 31 December 1990

<table>
<thead>
<tr>
<th>Field of Study</th>
<th>Number of Enrolments</th>
<th>Post-graduate</th>
<th>Undergraduate</th>
<th>Total</th>
<th>Per cent of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture and forestry</td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
<td>0.0</td>
</tr>
<tr>
<td>Architect/building</td>
<td></td>
<td>2</td>
<td>35</td>
<td>37</td>
<td>1.8</td>
</tr>
<tr>
<td>Business and administration</td>
<td></td>
<td>47</td>
<td>930</td>
<td>977</td>
<td>48.7</td>
</tr>
<tr>
<td>Computer and information sciences</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dentistry</td>
<td></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>0.0</td>
</tr>
<tr>
<td>Economics</td>
<td></td>
<td>13</td>
<td>187</td>
<td>200</td>
<td>10.0</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td>9</td>
<td>17</td>
<td>26</td>
<td>1.2</td>
</tr>
<tr>
<td>Engineering</td>
<td></td>
<td>5</td>
<td>79</td>
<td>84</td>
<td>4.2</td>
</tr>
<tr>
<td>Health and nursing</td>
<td></td>
<td>9</td>
<td>43</td>
<td>52</td>
<td>2.6</td>
</tr>
<tr>
<td>Humanities and social sciences</td>
<td></td>
<td>13</td>
<td>297</td>
<td>308</td>
<td>15.4</td>
</tr>
<tr>
<td>Language studies</td>
<td></td>
<td>1</td>
<td>6</td>
<td>7</td>
<td>0.3</td>
</tr>
<tr>
<td>Law</td>
<td></td>
<td>3</td>
<td>7</td>
<td>10</td>
<td>0.5</td>
</tr>
<tr>
<td>Life and physical sciences</td>
<td></td>
<td>5</td>
<td>52</td>
<td>57</td>
<td>2.8</td>
</tr>
<tr>
<td>Mathematics</td>
<td></td>
<td>2</td>
<td>8</td>
<td>10</td>
<td>0.5</td>
</tr>
<tr>
<td>Occupational therapy and physiotherapy</td>
<td></td>
<td>2</td>
<td>42</td>
<td>44</td>
<td>2.2</td>
</tr>
<tr>
<td>Visual and performing arts</td>
<td></td>
<td>8</td>
<td>38</td>
<td>47</td>
<td>2.3</td>
</tr>
<tr>
<td>Veterinary science</td>
<td></td>
<td></td>
<td>2</td>
<td>2</td>
<td>0.0</td>
</tr>
<tr>
<td>Total higher education</td>
<td></td>
<td>163</td>
<td>1,842</td>
<td>2,005</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Department of Employment, Education and Training, unpublished data

There have been two recent exercises in estimating the rate of return to education in Singapore (Ng 1987, Teo 1988). The different methodologies employed yield somewhat different results regarding the point estimates of the rate of return, but they are in general agreement as to the broad magnitude of the returns to university education. Both studies estimate the rate of return to a university qualification obtained in Singapore to be about 30 per cent. Ng (1987) also provides estimates of rates of return to particular subjects. Law, medicine, dentistry and commerce degrees yield the highest rates of return.

Lewis (1993b) calculated approximate rates of return to an Australian degree using data from the 1981 Singapore Inland Revenue Department census of graduates in Singapore. This allows the calculation of earnings each year since graduation by subject. Earnings for an economics graduate in the private sector were indexed to 1990 prices by multiplying by an index of average earnings of professional, administrative, managerial and executive workers (Singapore Yearbook of Statistics 1990). Starting salaries for graduates were taken from a survey of graduates conducted by the National University of Singapore in 1991. Alternative earnings were taken to be the average earnings for each age group of people with only secondary education from the 1980 census indexed by the increase in average earnings of all workers to yield an estimate of earnings in 1990 (Singapore Yearbook of Statistics 1990). Both earnings streams were converted to post-tax streams by applying the appropriate tax rates for 1990.

On the basis of the above assumptions the rates of return to Australian three year economics and commerce degrees were estimated to be about 20 per cent. The rates of return to
humanities and science degrees were found to be somewhat lower, 10 and 15 per cent, respectively.

Using more recent data from a 1992 survey of average earnings by age and occupation in Singapore, and cost of living data collected by Murdoch University's International Office, Lewis and Soh (1993) estimated the following rates of return.

Table 7: Rates of Return to Australian Degrees for Singaporeans, 1992

<table>
<thead>
<tr>
<th>Subject</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commerce</td>
<td>25.0</td>
<td>20.0</td>
</tr>
<tr>
<td>Economics</td>
<td>34.0</td>
<td>28.0</td>
</tr>
<tr>
<td>Computer science</td>
<td>25.0</td>
<td>20.0</td>
</tr>
</tbody>
</table>


These results also indicate the profitability of an Australian degree, particularly in economics. This is somewhat less than earlier estimates for a degree in Singapore, but certainly much higher than the real rate of interest. It implies that an Australian degree is a very sound investment and that fees are not excessive.

The high rate of return to tertiary education, the prestige attached to a degree in Singapore and the emergence of a wealthy middle class have continued to create a very large demand for higher education. Another factor, which has received little attention, is the role of the CPF scheme. Parents can use part of the savings in their CPF accounts to pay for their children's education in a Singaporean institution. Such withdrawals from CPF accounts are not allowed for education overseas. However, it is likely that the existence of an expected payout at age 55 reduces the need for private household savings and facilitates expenditure on education. In addition, parents may be very near retirement and hence are able to borrow on the strength of expected CPF benefits.

The above results also suggest that any failure of qualified students in Singapore to take advantage of overseas education opportunities is largely a result of the lack of provision of funds by financial institutions in Singapore. It is well known that private lenders will offer financial resources below those which are socially optimal (see Chapman and Chia 1992). One reason is that human capital investments lack the collateral usually associated with investments in physical capital. Another reason is that lending institutions are generally risk averse and attach a high weight to the possibility of default on the loan. For relatively wealthy families, there is not the same capital constraint as there is for poorer families. Therefore, the prohibition on the use of CPF funds for overseas education particularly limits poorer students from obtaining a university education. On equity grounds there is a good case for relaxing the restriction on the use of CPF funds.
5. Outlook

The economic prospects for Singapore continue to look good. Current estimates of key economic indicators imply an economic growth rate of about six per cent over the next five years, somewhat below that of recent years but nevertheless high by comparison with most other countries. Economic developments must be seen in the context of the government's long run plan for Singapore. To use a sporting analogy so often adopted in official pronouncements Singapore has moved from 'the third league into the second and the next step is to make it to the top league' The plan to achieve this is based on Singapore developing into a strategic centre servicing the South East Asian region. As stated in The Next Lap (Committee of Ministers of State, 1990):

Singapore has always been an entrepot, but a hub city is much more than an entrepot. A hub must offer first-class products and services. The infrastructure must rank with the best in the world. The quality of service must be acknowledged even by competitors. "Singapore" must become a synonym for quality, reliability and excellence. We will become a business hub of the Asia Pacific.

One of the key factors in achieving this transition is the further development of skills through education and training. Expansion of the education system is a key area of government policy in Singapore. The major aim of education policy is to ensure that all school leavers will have at least ten years of education. More polytechnic places will be made available to VITB graduates and more university places made available to polytechnic graduates. Polytechnics are to increase enrolments from 9,000 per year to 16,000 per year before the end of the decade. The Open University operated from 1994 and there is much talk about a possible 'third' university. Currently, 15 per cent of all students entering primary school eventually enter a university and 20 per cent enter a polytechnic. The aim according to Singapore's former Prime Minister, Lee Kuan Yew, is to increase these proportions to 20 per cent and 60 per cent respectively by 2000 (Straits Times, 2 November 1991).

Although the government is trying to alleviate the excess demand for tertiary education it is likely that demand will increase faster than supply, with consequent implications for Australia. The Open University is likely to appeal to a different market than full-time educational institutions. The number of 'A' level candidates will grow steadily, but the growth in polytechnic students will also have a great impact on the demand for overseas places. A growth in polytechnic first year enrolments from 9,000 to 16,000 will provide a potential source of students for Australian universities. This will involve a change in traditional recruitment since polytechnic graduates have the qualifications to enter the second year of Australian degrees. This suggests that mechanisms to allow exemption from the first year of degree programs must become more widespread in Australia.

Postgraduate education is also an obvious possible area of expansion for Singapore students overseas. At the moment, families attach great social status to an undergraduate degree. As the proportion of the population with undergraduate qualifications increases, it may become necessary to obtain a higher degree to achieve the same status previously attached to an undergraduate degree. However, given the very high extra earnings attached to an undergraduate degree, it is unlikely that there would be such a high rate of return to a higher degree. Any expansion in the market for higher degrees is likely to be in the area of commerce and economics.
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Malaysian Demand for University Education in Australia

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Department of Economics and Asia Research Centre
Murdoch University, Perth

1. Introduction

The export of higher education has become one of Australia's success stories. Overseas students in Australian universities are estimated to generate a net revenue of about $600 million a year to universities (Department of Employment, Education and Training 1993) and $2 billion a year in export income (Australian Financial Review, 17 February 1994). Given the value of this export industry it is important to understand the reasons behind the demand for Australian higher education and the possibility of its continuance in the future.

Malaysians are the largest group of overseas students in Australia, representing 20 per cent of the overseas student population. Despite the importance to university finances, and more generally, the Australian economy, there has been little research into the nature and extent of this demand for Australian higher education. This paper attempts to redress this somewhat using the standard tools of economic analysis and the application of human capital theory.

In this paper we identify factors contributing to the Malaysian demand for Australian higher education. First, the changing structure of the Malaysian economy has created an increasing need for highly skilled labour and consequent higher wages for these workers. This has resulted in an increasing demand for higher education in Malaysia. Second, the domestic supply of higher education has not grown sufficiently to match this increasing demand, creating an excess demand for higher education in Malaysia. Third, the profitability of an investment in Australia higher education makes Australia an attractive place to study. Finally, rising incomes among a growing middle class provide Malaysian families with the ability to finance investments in Australian higher education.

2. Background

In the 1950s and 1960s the Malaysian economy was very much geared to extraction of raw materials, particularly tin and rubber, with foreign-owned companies largely in control of financial and marketing structures. Local businesses were, and still are, mostly owned by Chinese Malaysians. Malays (or Bumiputera as they are officially known in Malaysia) were mostly peasants in the countryside or employed by government in the towns. There was continuing industrialisation, mainly in import-substitution sectors.

In the late 1960s and early 1970s multinational companies were anxious to find new locations for manufacturing with low labour costs but with suitable infrastructure. Malaysia was well placed given the road, rail and other infrastructure which remained as a legacy of British colonialism. In addition, the government instituted policies to attract foreign capital, such as the provision of industrial sites, labour laws to maintain a compliant workforce and investment in

* Thanks go to Paula Dartnall for her excellent research assistance and Sheila Anderson for her usual high standard of secretarial assistance. Financial support was provided by the Australian Research Council.
human capital to increase the skill levels of the workforce

Malaysia's recent period of economic development relates to the New Economic Policy which ran from 1971 to 1990. Among its major aims were: the elimination of poverty for all races, reduction of the association between ethnicity, occupation, education and ownership of capital, reduction of foreign ownership and increased local ownership, particularly for Malays. To achieve these aims government embarked on a number of policies relating to industrialisation, ownership of capital and human capital development.

The results of the new policy directions have been impressive. Malaysia has become an export oriented economy with both a resource and a manufacturing base. Growth rates of between five and ten per cent have been achieved in every year of the past decade. Currently, government policy is geared to increasing efficiency and productivity, including privatisation and contracting out of many public services. Complementary to developments in manufacturing and resource-based industries is the growth in service industries, particularly banking and finance.

Growth and structural change have brought about significant changes in the structure and composition of the labour force. Table 1 clearly illustrates the changing industrial structure in Malaysia.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, fishing etc</td>
<td>1800.5</td>
<td>1837.6</td>
<td>1821.9</td>
<td>2.1</td>
<td>27.8</td>
</tr>
<tr>
<td>Mining and quarrying</td>
<td>62.2</td>
<td>39.1</td>
<td>40.7</td>
<td>-37.1</td>
<td>1.0</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>748.8</td>
<td>1290.2</td>
<td>1699.1</td>
<td>72.3</td>
<td>19.4</td>
</tr>
<tr>
<td>Utilities</td>
<td>33.9</td>
<td>45.9</td>
<td>47.8</td>
<td>35.4</td>
<td>0.7</td>
</tr>
<tr>
<td>Construction</td>
<td>269.9</td>
<td>426.9</td>
<td>547.5</td>
<td>58.2</td>
<td>6.4</td>
</tr>
<tr>
<td>Transport and communication</td>
<td>189.5</td>
<td>285.4</td>
<td>345.4</td>
<td>50.6</td>
<td>4.2</td>
</tr>
<tr>
<td>Finance, insurance etc.</td>
<td>140.7</td>
<td>231.3</td>
<td>273.2</td>
<td>64.4</td>
<td>3.4</td>
</tr>
<tr>
<td>Wholesale, retail etc.</td>
<td>719.7</td>
<td>1239.4</td>
<td>1612.1</td>
<td>72.2</td>
<td>18.6</td>
</tr>
<tr>
<td>Government services</td>
<td>644.3</td>
<td>850.2</td>
<td>872.2</td>
<td>32.0</td>
<td>12.9</td>
</tr>
<tr>
<td>Other services</td>
<td>225.7</td>
<td>375.0</td>
<td>492.4</td>
<td>66.2</td>
<td>5.6</td>
</tr>
<tr>
<td>TOTAL</td>
<td>4835.2</td>
<td>6612.0</td>
<td>7752.3</td>
<td>36.9</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Note: (a) Forecast

Very important changes have occurred in the distribution of employment by industry and occupation and these are forecast to continue in the future (Lewis 1994). The primary sector, although the largest employer, has declined, proportionately, in importance. In contrast there has been very strong growth in the manufacturing and service industries. This trend is forecast to continue through the 1990s. In particular, between 1980 and 1990 employment in finance, insurance and the retail sector increased by about 70 per cent compared to a growth in the whole labour force of 37 per cent.

The changing structure of employment is also evident in the changing occupational distribution of employment. From Table 2 it can be seen that in recent years the largest growth has been among registered professionals, plus other professional and managerial/administrative...
occupations. Recent forecasts (Malaysia 1991) predict that professional, administrative and managerial workers will increase by 30 per cent between 1990 and 1995 compared to a forecast growth in the total labour force of 17 per cent. Among the professions, the number of accountants is expected to grow most rapidly (by about 48 per cent between 1990 and 1995).

Table 2: Distribution of Employment by Occupation, Malaysia

<table>
<thead>
<tr>
<th>Occupation</th>
<th>1985</th>
<th>1990</th>
<th>1995(a)</th>
<th>Growth 1985-90 (per cent)</th>
<th>Growth 1990-95(a) (per cent)</th>
<th>Percentage of total employment in 1990</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registered professional (b)</td>
<td>284</td>
<td>406</td>
<td>603</td>
<td>43.0</td>
<td>48.5</td>
<td>0.8</td>
</tr>
<tr>
<td>Professional/technical</td>
<td>421.7</td>
<td>580.8</td>
<td>732.2</td>
<td>37.7</td>
<td>37.7</td>
<td>9.4</td>
</tr>
<tr>
<td>Administrative/managerial</td>
<td>129</td>
<td>162.4</td>
<td>219.5</td>
<td>26.0</td>
<td>26.0</td>
<td>2.8</td>
</tr>
<tr>
<td>Teachers and nurses</td>
<td>169.6</td>
<td>218.5</td>
<td>276.3</td>
<td>29.0</td>
<td>29.0</td>
<td>3.5</td>
</tr>
<tr>
<td>Clerical</td>
<td>547.2</td>
<td>645.9</td>
<td>767.1</td>
<td>18.0</td>
<td>18.7</td>
<td>7.9</td>
</tr>
<tr>
<td>Sales</td>
<td>626.3</td>
<td>761.3</td>
<td>973.9</td>
<td>21.5</td>
<td>21.5</td>
<td>12.5</td>
</tr>
<tr>
<td>Service</td>
<td>642.2</td>
<td>770.3</td>
<td>937.7</td>
<td>19.9</td>
<td>19.9</td>
<td>12.6</td>
</tr>
<tr>
<td>Agricultural</td>
<td>1720.9</td>
<td>1872.5</td>
<td>1846.6</td>
<td>8.8</td>
<td>-2.0</td>
<td>23.8</td>
</tr>
<tr>
<td>Production</td>
<td>1537.3</td>
<td>1827.8</td>
<td>2275.3</td>
<td>18.8</td>
<td>24.0</td>
<td>29.3</td>
</tr>
<tr>
<td>TOTAL</td>
<td>5624.6</td>
<td>6621.0</td>
<td>7752.3</td>
<td>17.7</td>
<td>17.1</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Notes:  
(a) Forecast  
(b) Refers to members registered with eight professional bodies, i.e. architects, engineers, surveyors, doctors, dental surgeons, veterinarians, accountants and lawyers  

Source: Malaysia (1991)

3. Demand for Higher Education

The increased demand for professional workers and the higher incomes received (on average four times that of a semi-skilled worker) have created a huge demand for education in Malaysia. At primary and second levels the participation rate has been high for some time and hence growth in the number of students at these two levels, related as it is to population growth, has been relatively low (Table 3). In comparison participation in pre-school and post-compulsory education has increased markedly. Enrolments in university degree courses increased by 58.6 per cent between 1985 and 1990 and are planned to increase by a further 49 per cent by 1995.

Despite the growth of higher education in Malaysia the demand for university places has outstripped supply. In 1990 less than 20 per cent of applicants obtained a university place. A further indication of the excess demand for higher education in Malaysia is given by the number of students undertaking degree programs overseas. Table 4 shows that in 1991 over 36,000 Malaysians were studying overseas. This was over half as many as those studying in Malaysian universities. The most popular country to study in was the United States. Australia had the next highest share of the market with 7,832 students.
Table 3: Enrolment in Malaysian Institutions

<table>
<thead>
<tr>
<th>Level of Education</th>
<th>1985</th>
<th>1990</th>
<th>1995(a)</th>
<th>Growth 1985-90 (per cent)</th>
<th>Growth 1990-95(a) (per cent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-school</td>
<td>162,980</td>
<td>188,840</td>
<td>362,400</td>
<td>15.9</td>
<td>91.9</td>
</tr>
<tr>
<td>Primary</td>
<td>2,191,680</td>
<td>2,447,210</td>
<td>1,808,210</td>
<td>11.7</td>
<td>14.8</td>
</tr>
<tr>
<td>Secondary</td>
<td>1,255,270</td>
<td>1,312,480</td>
<td>1,716,030</td>
<td>4.6</td>
<td>30.7</td>
</tr>
<tr>
<td>Post secondary (b)</td>
<td>100,880</td>
<td>133,900</td>
<td>172,280</td>
<td>32.7</td>
<td>28.7</td>
</tr>
<tr>
<td>Degree</td>
<td>37,840</td>
<td>60,010</td>
<td>89,680</td>
<td>58.6</td>
<td>49.0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>3,748,650</td>
<td>4,142,380</td>
<td>5,148,600</td>
<td>10.5</td>
<td>24.3</td>
</tr>
</tbody>
</table>

Notes: (a) Forecast
(b) Includes teacher education, certificate and diploma courses
Source: Malaysia (1991)

Table 4: Malaysian Students Overseas by Country, 1991

<table>
<thead>
<tr>
<th>Country</th>
<th>Total Enrolment</th>
<th>Per Cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>14,021</td>
<td>38.6</td>
</tr>
<tr>
<td>Australia</td>
<td>7,832</td>
<td>21.0</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>6,310</td>
<td>17.4</td>
</tr>
<tr>
<td>Singapore</td>
<td>3,687</td>
<td>10.2</td>
</tr>
<tr>
<td>Canada</td>
<td>1,410</td>
<td>3.9</td>
</tr>
<tr>
<td>New Zealand</td>
<td>1,100</td>
<td>3.0</td>
</tr>
<tr>
<td>Japan</td>
<td>983</td>
<td>2.7</td>
</tr>
<tr>
<td>Other</td>
<td>1,498</td>
<td>4.2</td>
</tr>
<tr>
<td>TOTAL</td>
<td>36,841</td>
<td>100.0</td>
</tr>
</tbody>
</table>


A further insight into the nature of the demand for university education overseas can be gained by comparing the distribution of students by discipline in Malaysian universities with that for Malaysian students in Australian universities. Table 5 shows that the biggest disparity between the two countries is in the area of economics and commerce. 50.8% of Malaysian students at Australian universities in 1991 were enrolled in economics and commerce compared to 22.4% of those enrolled in Malaysian universities.
Table 5: Malaysian Student Enrolments by Discipline in Australian and Malaysian Universities, 1991 (per cent)

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Malaysia</th>
<th>Australia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arts and Humanities</td>
<td>31.5</td>
<td>39</td>
</tr>
<tr>
<td>Education</td>
<td>-</td>
<td>0.5</td>
</tr>
<tr>
<td>Economics and Commerce</td>
<td>22.4</td>
<td>50.8</td>
</tr>
<tr>
<td>Law</td>
<td>3.8</td>
<td>3.1</td>
</tr>
<tr>
<td>Medicine and Dentistry</td>
<td>5.2</td>
<td>10.4</td>
</tr>
<tr>
<td>Science</td>
<td>19.8</td>
<td>12.8</td>
</tr>
<tr>
<td>Engineering, Surveying and Architecture</td>
<td>14.5</td>
<td>17.7</td>
</tr>
<tr>
<td>Other</td>
<td>0.3</td>
<td>0.2</td>
</tr>
<tr>
<td>Total (per cent)</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total number</td>
<td>60,030</td>
<td>7,832</td>
</tr>
</tbody>
</table>


In medicine and dentistry, the percentage of Malaysian students enrolled in these degrees in Australian universities is twice as high as the percentage enrolled in Malaysian universities. The proportions of Malaysian students enrolled in engineering, surveying and architecture are very similar in both Australian and Malaysian universities. However, in arts and humanities, while 31.5 per cent of Malaysian students were enrolled in these degrees in Malaysian universities, only 3.9 per cent were enrolled in them in Australian universities in 1991.

There are several possible explanations for these differences in distribution of students by discipline. For instance, tastes and perceived differences in quality may mean that Malaysians prefer to study arts and science subjects at Malaysian universities, but economics and commerce at Australian universities. However, there is overwhelming anecdotal evidence (see for instance, Pratt 1994) that, given a choice, most Malaysian students would prefer to study at a local university. Together with the distributions in Table 5, this suggests that the greatest excess demand is for economics and commerce degrees.

Part of the explanation for the need to study overseas is related to ethnicity. The ethnic Chinese in Malaysia are disproportionately represented in the professional classes, the higher end of the income distribution and in business. However, affirmative action provisions provide for university places to be distributed according to the ethnic distribution of the population as a whole. Given that the Chinese population is disproportionately well educated, potential university students from this group find it harder to obtain a place. Since Chinese families have disproportionately higher incomes, many can provide the finance for study overseas. Thus ethnic Chinese form the great majority of Malaysian students overseas.

Another important factor influencing the decision to study overseas is the language policy in Malaysia. Undergraduate courses are taught in Bahasa Malaysia, the first language of the Bumiputera. The second language of the ethnic Chinese and the international language of business is English. Therefore, higher education in an English-speaking country is seen to have important advantages.
4. The Supply of Higher Education in Australia

The huge excess demand for higher education in Malaysia has created enormous opportunities for Australia with its comparative advantage in the provision of educational services. Australian universities have taken advantage of these opportunities and have, generally, displayed an unusual degree of entrepreneurial flare in capturing a big portion of the market.

Malaysian students can undertake an Australian degree through three programs of study: Private, Twinning, and Sponsored programs. Private programs attract the highest proportion of Malaysian students, however, 'Twinning' programs, which are relatively recent, are becoming increasingly popular. Only a minority of Malaysian students undertake degrees through Sponsored programs because of the limited number of scholarships.

Under Private programs, the student can study a degree in any discipline. The whole of the degree is undertaken in Australia and full tuition fees are paid by the student. Twinning programs involve a degree program in which the Malaysian student completes the initial year or two years of the degree in a Malaysian Twinning institution but the final years in Australia, and is awarded an identical degree from an Australian university (Smart 1988). In the years undertaken in Malaysia, tuition fees are typically much lower than would be paid in Australia.

Under Sponsored programs, selected students are sponsored by the Malaysian government. These students are almost exclusively Malays (Andressen 1990). The Malaysian Government funds the full tuition fees and provides a living allowance of between $A433 and $A531 per month, with two and a half months allowance provided in the first and last month. All medical expenses are also funded by the Malaysian Government.

The ethnicity of Malaysian students, the disciplines studied, and how these students are distributed between the different Australian states and universities, are also relevant. With respect to the ethnicity of Malaysian students in Australia, very little data are available. However, in 1988 the Australian Trade Commission (AUSTRADE) suggested that 87 per cent of Malaysian students in Australia were ethnic Chinese, 5 per cent were Indian, 6 per cent were Malay and 2 per cent fell under the heading of Other. It is expected that this distribution has not changed significantly.

Unlike students from Singapore, who mostly study in Western Australia (Lewis 1993), Malaysian students are concentrated in universities in the eastern states. In his study of Singapore students in Australia, Lewis (1993) emphasised the importance, not only of the cost factors associated with the location decision, but also of existing students and immigrants. The choice of place to study is also heavily influenced by word-of-mouth. Therefore, flows of students to a particular state or university are, to a great extent, dependent on the number of students who have studied there in the past.

Monash University is by far the most popular place for Malaysians to study, followed by the University of New South Wales and the Royal Melbourne Institute of Technology. (Table 6) The popularity of Victoria, and Monash in particular, is the result of an early marketing strategy by Monash University when Australia first began to export higher education. The majority (40 per cent) of Malaysian students are in Victorian universities. Western Australia and New South Wales are the next most popular destinations (about 18 per cent in each state).

---

1 In the past, the Australian government through the Australian International Development Assistance Bureau (AIDAB) also sponsored Malaysian students. This program has now been phased out.
Table 6: Enrolments of Malaysian Students in the Top Ten Universities, 1991

<table>
<thead>
<tr>
<th>University</th>
<th>Total Enrolment</th>
<th>Per cent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monash University</td>
<td>1,155</td>
<td>14.7</td>
</tr>
<tr>
<td>University of New South Wales</td>
<td>617</td>
<td>7.8</td>
</tr>
<tr>
<td>Royal Melbourne Institute of Technology</td>
<td>574</td>
<td>7.3</td>
</tr>
<tr>
<td>Curtin University</td>
<td>542</td>
<td>6.9</td>
</tr>
<tr>
<td>University of Melbourne</td>
<td>495</td>
<td>6.3</td>
</tr>
<tr>
<td>University of Western Australia</td>
<td>478</td>
<td>6.1</td>
</tr>
<tr>
<td>Flinders University</td>
<td>346</td>
<td>4.4</td>
</tr>
<tr>
<td>Deakin University</td>
<td>344</td>
<td>4.4</td>
</tr>
<tr>
<td>University of Adelaide</td>
<td>326</td>
<td>4.2</td>
</tr>
<tr>
<td>Edith Cowan University</td>
<td>284</td>
<td>3.6</td>
</tr>
<tr>
<td>Total, top 10 universities</td>
<td>5,161</td>
<td>65.9</td>
</tr>
<tr>
<td>Total, all universities</td>
<td>7,832</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Department of Employment, Education and Training, unpublished data

5. The Rate of Return to an Australian Degree

The large number of students from Malaysia studying for Australian degrees is itself strong evidence of the profitability of investment in overseas education. However, we have attempted to quantify this profitability by calculating the rate of return to an Australian degree.

In previous studies on the rate of return to education in developed countries (for example, Miller 1982) use is made of cross-sectional data on individuals' earnings, age, sex, education and other relevant characteristics. For most of the newly industrialised countries, including Malaysia, such data are not available and the researcher needs to make certain assumptions in order to obtain results of interest. Data from the 1991 Occupational Wages Survey in Manufacturing Sector (Ministry of Human Resources, Malaysia 1991) allow average earnings profiles to be constructed for occupations. Thus, we can determine what a graduate in a particular occupation would receive 'on average' over his or her career. The relevant careers which correspond to the most popular Australian degrees were accountant, systems analyst, engineer and chemist.

The approach adopted in this paper, strictly speaking, estimates a rate of return to the occupation rather than the degree. This would somewhat cloud the results if, say, some Malaysians practising as accountants had degrees in disciplines other than accountancy. However, since professionals are registered in Malaysia and need to be qualified in the respective disciplines, there is not likely to be a serious bias in the results. To the extent that some engineers, chemists etc have entered higher paid managerial positions and are not practising in their discipline, the estimates would be biased downwards somewhat. Implicit, also, in the methodology adopted is that the rewards to Australian-trained graduates are the same as to those trained in Malaysia. There is no reliable evidence, one way or the other, regarding this assumption.

In order to calculate the net increase in earnings from a degree it is necessary to generate an
alternative earnings series for non-graduates. A series for the earnings of workers who had obtained no qualifications beyond the Malaysian High School Certificate was calculated from the same survey data. Each earnings stream was adjusted for income tax deductions using tax scales from the Department of Statistics, Malaysia (1992). In order to convert the earnings data into the same units as costs the earnings streams were adjusted by the average exchange rate for 1991.

Finally, the earnings series were adjusted for the probability of unemployment and differences in participation rates following Miller (1982). The expected earnings and alternative earnings streams were multiplied by the complement of the average unemployment rate of, respectively, graduates and non-graduates at different ages. The respective earnings streams were multiplied by the relevant participation rates according to sex, educational level and age. The relevant unemployment rates and participation rates were derived from the Labour Force Report, Malaysia, 1991.

On the costs side, four programs were considered: Private, Twinning 1, Twinning 2 and Sponsored. For students on Private programs the annual living costs incurred in Australia in excess of those which would be incurred in Malaysia for the full three or four years duration were calculated. In addition, university fees, expenditure on books and stationery, student visa fee, compulsory medical insurance, air fares and visa costs were included.

Monash University provided estimates on tuition fees and expenditure on books and stationery for 1991. Monash has the greatest number of Malaysian students and has a fee structure comparable with other Australian universities. With respect to living expenses Monash University (1993) and the University of New South Wales (1993) have produced estimates of total expenses of $9,020 and $10,000 respectively. The Western Australian Department of State Development (1992) has produced detailed estimates of the various categories of expenditure for students in Perth (Table 7). The total expenditure figure is similar to that for Melbourne, but somewhat less than that for Sydney.

### Table 7: Annual Living Expenses of Overseas Students in Perth, 1991

<table>
<thead>
<tr>
<th>Type of Expense</th>
<th>Annual Cost ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rent</td>
<td>3,588</td>
</tr>
<tr>
<td>Food</td>
<td>2,286</td>
</tr>
<tr>
<td>Transport</td>
<td>1,508</td>
</tr>
<tr>
<td>Other</td>
<td>1,716</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>9,100</strong></td>
</tr>
</tbody>
</table>

Source: Department of State Development, Western Australia (1992)

The Western Australian survey also provided an estimate of expenditure on books and stationery of $362. An estimate of the average annual living expenditure which a student would incur in Malaysia, $3,540, was derived from data from the Malaysian Yearbook of Statistics, 1992.

For students on Twinning programs, the fees for study in Malaysia replaced the Australian fees for one year (Twinning 1) or two years (Twinning 2) of study at home. Additional living costs plus visa, insurance and air fares for the first (or first and second) years of study were excluded. Data on fees charged by Twinning institutions were provided by the Australian Education
Centre in Kuala Lumpur

For Sponsored students fees are paid and a living allowance provided which must be deducted from the costs of a degree. In other respects costs were the same for Sponsored students as for Private students.

The estimated rates of return for various degrees and programs are given in Table 8. Note that the unadjusted figures are 'gross' estimates in that they attribute all the increase in earnings to education. It could be argued, however, that part of the extra earnings graduates obtain is because of innate ability, family background etc., which they would earn even without a degree. It is common in studies where data on individuals are available to estimate 'earnings functions' where explicit account is taken of effects of a whole range of personal characteristics of individuals. Since data on individuals are not available it is not possible to estimate correctly what the effects of these 'other' factors would be. Typically, in other studies, the expected increment from higher education is multiplied by the 'alpha coefficient', generally agreed to be about 66 (Norris 1993). Thus it is assumed two thirds of the increased earnings is due to education alone. Table 8 includes both the gross rates of return, 'unadjusted', and the net rates of return 'adjusted' by applying the alpha coefficient to earnings differentials.

Table 8: Rates of Return to Australian Degrees for Malaysian Students (Per Cent)

<table>
<thead>
<tr>
<th>Degree Program</th>
<th>Male</th>
<th></th>
<th>Female</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unadjusted</td>
<td>Adjusted</td>
<td>Unadjusted</td>
<td>Adjusted</td>
</tr>
<tr>
<td>Commerce</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td>32</td>
<td>23</td>
<td>36</td>
<td>26</td>
</tr>
<tr>
<td>Twinning 1</td>
<td>35</td>
<td>25</td>
<td>39</td>
<td>28</td>
</tr>
<tr>
<td>Twinning 2</td>
<td>38</td>
<td>27</td>
<td>43</td>
<td>31</td>
</tr>
<tr>
<td>Sponsored</td>
<td>67</td>
<td>51</td>
<td>98</td>
<td>76</td>
</tr>
<tr>
<td>Information Systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td>22</td>
<td>16</td>
<td>26</td>
<td>19</td>
</tr>
<tr>
<td>Twinning 1</td>
<td>23</td>
<td>17</td>
<td>28</td>
<td>20</td>
</tr>
<tr>
<td>Sponsored</td>
<td>51</td>
<td>38</td>
<td>82</td>
<td>63</td>
</tr>
<tr>
<td>Engineering</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td>13</td>
<td>9</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Sponsored</td>
<td>28</td>
<td>21</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Science</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td>26</td>
<td>18</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Sponsored</td>
<td>64</td>
<td>48</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

The estimates indicate that for all programs an Australian degree is extremely profitable, since all rates of return well exceed the real rate of interest in Malaysia which averaged 3 per cent in 1991 (Department of Statistics, Malaysia 1992). The estimates are, generally, somewhat lower than those found by Mehmet and Hoong (1986) for Malaysian university degrees. This is as would be expected given the higher costs of study abroad. The above estimated rates of return are also considerably higher than those of Lewis (1993) for Singaporeans studying in Australia. The difference is largely due to the much more extreme percentage differences in earnings between graduates and non-graduates in Malaysia compared with Singapore.
With respect to the different programs, obviously the Sponsored programs offer the greatest rates of return since they are heavily subsidised. Virtually the only costs a student has to bear are the alternative earnings foregone, which are very low compared to the future stream of earnings. The advantages to students of Twinning programs are indicated by rates of return, which are between two and six percentage points higher than under Private programs. However, given the very high rate of return to Private programs the extra profitability does not explain fully the growing popularity of Twinning arrangements between Malaysian institutions and Australian universities. It is more likely that the reduced requirement to borrow funds to meet expenses overseas is regarded as quite important by Malaysian families.

Of the disciplines considered here, commerce offers the highest rate of return. In fact the estimated rates of return to a commerce degree in Australia in 1991 exceed those found by Mehmet and Hoong (1986) for students taking commerce degrees in Malaysia in 1985. This gives an indication of the degree to which the salaries of business graduates have increased in Malaysia. The particularly high rates of return for a commerce degree are an important factor explaining the huge demand for these degree programs in Australia.

Finally, the above results imply that the rates of return for women graduates are greater than those for males. The reason for this is that although women graduates receive lower salaries than men and have lower participation rates through certain periods of their lives, there is a much greater proportional difference in earnings between graduate and non-graduate women than there is for men.

The profitability of investment in higher education overseas implies that the inability of many qualified Malaysians to take advantage of a university education relates to the reluctance of Malaysian financial institutions to lend money for education. It is well known that private lending institutions will be reluctant to offer resources for education which are socially optimal (Chapman and Chia 1992). One reason is that human capital investments lack the collateral usually associated with investments in physical capital. Another reason is that lending institutions are generally risk averse and attach a higher weight to the possibility of default on the loan. For relatively wealthy families there is not the same capital constraint as there is for poor families. Economic development in Malaysia has created a growing number of increasingly wealthy families who can take advantage of the very profitable investment which expenditure on their children’s overseas education represents.

6. Conclusion

The huge growth in demand for an Australian university degree by Malaysian students has received little attention from economists despite its importance to the higher education sector and the economy generally. In this paper the growth in demand has been attributed to growth and structural change in the Malaysian economy, the inability of Malaysian universities to meet this demand, the profitability of an Australian degree and the growth of middle class families able to finance investments in overseas education.

This study has two important implications for the export of Australian higher education to Malaysia. First, the high rates of return to Australian degrees suggest that Australian university degrees are not over-priced. Malaysian students are getting an excellent return on their investment in Australian higher education. There may even be scope to increase tuition fees without affecting demand as long as Australia does not become uncompetitive with other countries.

The second implication of this study relates to the extent to which the strong Malaysian demand for Australian higher education can be expected to continue in the future. This depends on
Transitions Between Education, Training and Work

Phillip McKenzie
Australian Council for Educational Research

1. Introduction

Over the past 10 years there have been substantial changes in the education, training and labour market environments faced by young Australians. The pace of change is likely to continue, if not accelerate, during the rest of the 1990's. One helpful way to reflect on the changes that are occurring is to examine the transitions that young people make between different forms of postcompulsory education and training, and between education and the labour market. This paper examines key national trends in education and training participation, and movements between various sectors.

2. Information Needs and Availability

The recent and prospective developments in postcompulsory education and training have put a premium on improved information about the education, training and employment pathways available to young Australians. Australia is not alone in trying to grapple with the statistical and information demands of trying to provide more coherent and productive pathways through education and training for young people. As the OECD noted in a recent review:

Available qualitative and quantitative information concerning the impact of both educational reforms and other factors on young people's choices [of pathways in vocational education and training] is in most countries quite poor (OECD 1994, p.3).

It needs to be recognised, however, that the past few years have seen major initiatives to extend and reform existing databases on post-compulsory education and training in Australia. Some of those changes, such as the new classification of levels of educational qualifications developed by the Australian Bureau of Statistics (ABS), are now in place. Others are about to be implemented. Perhaps the most significant of these imminent developments is the Australian Vocational Education and Training Management Information Statistical Standard (AVETMISS) which has been coordinated through the Committee on TAFE and Training Statistics (COTTS). This work is likely to lead to improved data on completions in the TAFE courses, commencing with 1994 data. Such information is vital if the targets for educational attainments by young people are to be translated into the level and pattern of enrolments needed to achieve the targets. Also noteworthy is the fact that several State and Territory education authorities are moving towards developing student-centred record systems that have the potential to facilitate more detailed mapping of the pathways that young people follow through different education sectors.

Despite recent improvements in Australian databases, real concerns remain about their adequacy for policy making on student pathways. Such concerns include issues of definition, scope and timing of the data collections, the lack of detail on particular target groups of students, and the lack of comparability between different databases. To properly address the types of issues raised by the pathways approach to educational policy making, databases should...
enable information to be extracted on students’ post-course destinations in further education and training or in the labour force. At the present time such information is largely confined to those young people on the pathway from Year 12 to higher education.

3. Enrolments in Postcompulsory Education

In 1994 there were just over 5 million students in different forms of education in Australia. As Table 1 shows, around 2.7 million of these students were in the compulsory years of schooling (up to and including Year 10) while some 2.3 million were in the different sectors of postcompulsory education. Between 1988 and 1994 the total number of students in Australia increased by about half a million, or 11 per cent. Almost all of this growth was concentrated in the postcompulsory sectors, especially in tertiary education. In 1988 some 59 per cent of all Australia’s students were enrolled in school up to and including Year 10. By 1994 this proportion had declined to 54 per cent.

Both TAFE and higher education have grown by remarkable rates since 1988. Total enrolments in streams 2100 to 4500 of TAFE grew by 29 per cent and higher education enrolments increased by 39 per cent. The growth in higher education enrolments was particularly rapid from 1988 to 1991. Over the past three years TAFE enrolments have grown faster than higher education student numbers.

Table 1: Students, Australia, 1988 to 2001 (000’s)

<table>
<thead>
<tr>
<th></th>
<th>School to Year 10</th>
<th>School Years 11 &amp; 12</th>
<th>TAFE</th>
<th>Higher Education</th>
<th>Other</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988</td>
<td>2651</td>
<td>372</td>
<td>952</td>
<td>421</td>
<td>110</td>
<td>4505</td>
</tr>
<tr>
<td>1989</td>
<td>2659</td>
<td>372</td>
<td>932</td>
<td>441</td>
<td>131</td>
<td>4536</td>
</tr>
<tr>
<td>1990</td>
<td>2665</td>
<td>376</td>
<td>967</td>
<td>485</td>
<td>151</td>
<td>4645</td>
</tr>
<tr>
<td>1991</td>
<td>2677</td>
<td>398</td>
<td>986</td>
<td>535</td>
<td>134</td>
<td>4730</td>
</tr>
<tr>
<td>1992</td>
<td>2692</td>
<td>407</td>
<td>1043</td>
<td>559</td>
<td>163</td>
<td>4863</td>
</tr>
<tr>
<td>1993</td>
<td>2701</td>
<td>398</td>
<td>1121</td>
<td>576</td>
<td>122</td>
<td>4917</td>
</tr>
<tr>
<td>1994 (prelim)</td>
<td>2716</td>
<td>384</td>
<td>1228</td>
<td>586</td>
<td>88</td>
<td>5000</td>
</tr>
</tbody>
</table>

Projections assuming constant age participation or retention rates

<table>
<thead>
<tr>
<th></th>
<th>1996</th>
<th>2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>School to Year 10</td>
<td>2772</td>
<td>2856</td>
</tr>
<tr>
<td>School Years 11 &amp; 12</td>
<td>387</td>
<td>417</td>
</tr>
<tr>
<td>TAFE</td>
<td>1237</td>
<td>1266</td>
</tr>
<tr>
<td>Higher Education</td>
<td>583</td>
<td>590</td>
</tr>
<tr>
<td>Other</td>
<td>89</td>
<td>93</td>
</tr>
<tr>
<td>TOTAL</td>
<td>5068</td>
<td>5222</td>
</tr>
</tbody>
</table>

Change

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>School to Year 10</td>
<td>2%</td>
<td>5%</td>
</tr>
<tr>
<td>School Years 11 &amp; 12</td>
<td>3%</td>
<td>9%</td>
</tr>
<tr>
<td>TAFE</td>
<td>29%</td>
<td>3%</td>
</tr>
<tr>
<td>Higher Education</td>
<td>39%</td>
<td>1%</td>
</tr>
<tr>
<td>Other</td>
<td>-20%</td>
<td>6%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>11%</td>
<td>4%</td>
</tr>
</tbody>
</table>

Note: TAFE data refer to students in streams 2100 to 4500 (i.e., excluding leisure courses) enrolled at any time of the year.

Source: Burke (1995)

Initial projections of enrolment levels for the period to 2001 have been provided by Burke (1995). The projections are included in Table 1. Based on 1994 participation rates, the enrolment projections for the period 1994 to 2001 suggest that total enrolment growth (4 per cent) will be much lower than that which occurred in the 1988-94 period (11 per cent). The fastest rates of enrolment growth are projected to occur in Years 11 and 12 (9 per cent) and schooling up to Year 10 (5 per cent).
In contrast to the past few years, TAFE enrolments are projected to grow by 3 per cent, and higher education by just 1 per cent. The main reason that the pattern of enrolment growth is projected to be different over the second half of the 1990's is that the number of 5-14 year-olds is projected to grow by about 3 per cent from 1996 to 2001, the number of 15-19 year-olds to increase by 5 per cent, and the number of 20-24 year-olds to decline by 6 per cent. The first two age groups determine the demand for the school places while the latter is particularly important for TAFE and higher education.

As Figure 1 shows, the number of 15-19 year-olds declined by 8 per cent between 1988 and 1993, while the number of 20-24 year-olds increased by about the same proportion. Both age groups are projected to decline until 1996, after which the number of 15-19 year-olds is projected to increase by 5 per cent by the year 2001 while the number of 20-24 year-olds will continue to decline. The figures for the 15-19 age group suggest that if it had not been for rising school retention rates, the number of senior secondary students would probably have declined during the early 1990's.

**Figure 1: Population Aged 15-19 and 20-24 (000's)**

In terms of secondary schools there are three broad implications of the projected enrolment changes shown in Table 1:

- the projected rise in school enrolments will lift demand for teachers and new school facilities, especially in regions with above-average population growth;

- by 2001 about one in three secondary students will be enrolled in Years 11 and 12 (compared to about one in five in the early 1980's) which will intensify the demand for teachers and facilities; and
• the fact that senior secondary enrolments are projected to grow faster than TAFE and higher education enrolments suggests increased competition for tertiary places.


Table 2 documents the major types of education and work that 15-19 year-olds were engaged in at May 1994. Two-thirds (66 per cent) were enrolled in full-time education and a further 7 per cent were enrolled part-time. Thus, almost three-quarters of 15-19 year-olds were participating in education at that time. School was the major form of this education participation, enrolling 49 per cent of the age group. Higher education was the next largest category, with 12 per cent of 15-19 year-olds enrolled, then came TAFE (10 per cent), and other forms of tertiary education such as business colleges and industry skills centres (1 per cent).

<table>
<thead>
<tr>
<th></th>
<th>Full-time Education</th>
<th>Part-time Education</th>
<th>Not in Education</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full-time employed</td>
<td>2,000</td>
<td>64,000</td>
<td>153,000</td>
<td>219,000</td>
</tr>
<tr>
<td>Part-time employed</td>
<td>247,000</td>
<td>12,000</td>
<td>62,000</td>
<td>321,000</td>
</tr>
<tr>
<td>Unemployed</td>
<td>62,000</td>
<td>9,000</td>
<td>92,000</td>
<td>163,000</td>
</tr>
<tr>
<td>Not in labour force</td>
<td>527,000</td>
<td>3,000</td>
<td>39,000</td>
<td>568,000</td>
</tr>
<tr>
<td>TOTAL</td>
<td>839,000</td>
<td>87,000</td>
<td>345,000</td>
<td>1,271,000</td>
</tr>
</tbody>
</table>

Source: ABS, Transition from Education to Work, Australia, May 1994 (6227.0).

One of the striking features of Table 2 is that large numbers of full-time students are also in part-time employment. Almost 30 per cent of full-time students had a part-time job in May 1994, which meant that just under one-fifth of 15-19 year-olds (19 per cent) were combining full-time education with part-time work.

Traditionally, the most common way for young people (especially males) to combine education and employment has been through an apprenticeship. As Figure 2 shows, however, the number of 15-19 year-old apprentices almost halved between 1989 and 1994 (from 124,000 to 67,000) as the recession took hold in the early 1990's. In 1994 just 5 per cent of 15-19 year-olds were in an apprenticeship, which must be close to an historic low. Of course, the apprenticeship system has been in a state of transition since the recommendations by Carmichael (1992) for establishment of a national competency-based entry-level training system that would, among other things, merge the apprenticeship and traineeship systems into the Australian Vocational Certificate system (AVC), and provide entry-level training to much greater numbers of young people.
Just over a quarter of 15-19 year-olds (27 per cent) were not enrolled in education in May 1994. Some 12 per cent were in full-time employment, 5 per cent were part-time employed, 7 per cent were unemployed and 3 per cent were not in the labour force.

Figure 2: Number of Apprentices, Australia, 1989-94 (000's)

From a policy perspective, the young people of most concern are those who are unemployed, those who are partially engaged in either education or work, and those who are involved neither in education nor in the labour force. In May 1994 just over 200,000 15-19 year-olds were in these categories, which represented 16 per cent of the age group. It is these young people who are most at risk of long-term unemployment.

It was partly to address the needs of young people with little attachment to either the education system or the labour market that the 1991 Finn Report on post-compulsory education and training recommended, and State and federal governments agreed, that by the year 2001 95 per cent of 19 year-olds should have completed Year 12 or an equivalent initial post-school qualification or be participating in formally recognised education and training. At least half of these students would be expected to proceed to higher levels of education and training.

Comparing current enrolment levels and qualifications of 19 year-olds with the Finn targets (and examining long term enrolment trends) is complicated by the fact that in 1993 the ABS adopted a new classification system for educational qualifications. In 1993 the ABS also tightened the definition of educational participation to exclude students enrolled for courses of less than one semester in duration and students not studying for a qualification. The net effect is that post-school enrolments based on ABS survey data are now some 150,000 to 200,000 lower than could have been expected under the old methodology. The impact of the changed definition appears to have been particularly marked in estimates of TAFE student numbers.

Initial estimates by Burke (1995) suggest that by 1994 about 78 per cent of 19 year-olds had reached the completion and participation target of 95 per cent for 19 year-olds recommended by Finn. The proportion of 78 per cent appears to have been stable since 1992, largely due to the decline in Year 12 retention rates since that time (see Table 3). If Year 12 retention rates do not recover it may prove difficult to reach the Finn target for 19 year-olds by 2001.
Table 3: Apparent Year 12 Retention Rates, 1991-94 (per cent)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Government</td>
<td>67</td>
<td>74</td>
<td>73</td>
<td>na</td>
</tr>
<tr>
<td>Catholic</td>
<td>72</td>
<td>76</td>
<td>77</td>
<td>na</td>
</tr>
<tr>
<td>Independent</td>
<td>101</td>
<td>101</td>
<td>98</td>
<td>na</td>
</tr>
<tr>
<td>Total non-government</td>
<td>82</td>
<td>85</td>
<td>84</td>
<td>na</td>
</tr>
<tr>
<td>TOTAL</td>
<td>71</td>
<td>77</td>
<td>77</td>
<td>73 (p)</td>
</tr>
</tbody>
</table>

Source: ABS, *Schools Australia* (4221.0)


In May 1994 there were some 1.43 million 20-24 year-olds in Australia. As Table 4 shows the largest single category of activity is full-time employment and no educational participation (46 per cent of the age group). In all, just over half of the age group (54 per cent) were in full-time employment. Just 9 per cent of the age group were in full-time education and not in the labour force. In total, 17 per cent of the age group were enrolled in full-time education and a further 10 per cent were enrolled part-time.

It is worth noting that in May 1994 the number of unemployed 20-24 year-olds (163,000) was almost exactly the same as the number of unemployed 15-19 year-olds. Although the unemployment rate (measured as the proportion of unemployed members of the labour force) for 15-19 year-olds was much higher (23 per cent) than for 20-24 year-olds (14 per cent), the proportion of unemployed in the age group as a whole was quite similar for 15-19 and 20-24 year-olds (13 per cent and 11 per cent, respectively). In contrast to the 15-19 year-olds, fewer unemployed 20-24 year-olds were enrolled in educational activities in May 1994. A number of programs in the 1994 *Working Nation* package are geared to unemployed young people in their early twenties.

Table 4: Education and Labour Force Activities of 20-24 Year-Olds, Australia, May 1994

<table>
<thead>
<tr>
<th></th>
<th>Full-time Education</th>
<th>Part-time Education</th>
<th>Not in Education</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full-time employed</td>
<td>6,000</td>
<td>101,000</td>
<td>663,000</td>
<td>771,000</td>
</tr>
<tr>
<td>Part-time employed</td>
<td>94,000</td>
<td>19,000</td>
<td>126,000</td>
<td>239,000</td>
</tr>
<tr>
<td>Unemployed</td>
<td>17,000</td>
<td>10,000</td>
<td>136,000</td>
<td>163,000</td>
</tr>
<tr>
<td>Not in labour force</td>
<td>126,000</td>
<td>6,000</td>
<td>123,000</td>
<td>255,000</td>
</tr>
<tr>
<td>TOTAL</td>
<td>243,000</td>
<td>136,000</td>
<td>1,048,000</td>
<td>1,427,000</td>
</tr>
</tbody>
</table>

The Finn report recommended that by 2001 at least 60 per cent of 22 year-olds should have attained at least a diploma, degree or vocational certificate or be studying towards such qualifications. Initial estimates by Burke (1995) suggest that by 1994 about 39 per cent of 22 year-olds had obtained at least the target level of post-school qualification and a further 14 per cent were studying for such qualifications. This provides a total of 53 per cent to compare with the Finn target of 60 per cent for 22 year-olds, although the actual level of qualifications held may be somewhat lower than this due to measurement difficulties posed by changes in the ABS classification of qualifications. It seems that a substantial education and training effort remains to lift participation and completion levels to the targets for 22 year-olds proposed by Finn for 2001.

6. Destinations of School Leavers

The ABS estimates that in May 1994 there were 285,000 15-24 year-olds who were not attending school but who had attended school in 1993. Figure 3 summarises the post-school activities of these school leavers. Just over one-half (52 per cent) were enrolled in tertiary education. Of these, slightly more (25 per cent) were enrolled in higher education than in TAFE (24 per cent). A further 3 per cent were enrolled in other forms of tertiary education.

Non-government school leavers were more likely to enrol in tertiary education than government school students (67 per cent and 47 per cent of school leavers, respectively). School leavers from both types of schools enrolled in TAFE courses in much the same proportions (about 24 per cent each). However, leavers from non-government schools were twice as likely to enrol in higher education than were students from government schools (39 per cent and 20 per cent of school leavers, respectively). Indeed TAFE was a more common destination for government school leavers than was higher education. In the case of leavers from non-government schools the converse applied. Even school leavers from Year 12 level in government schools enrolled in TAFE in greater numbers than they enrolled in higher education. Year 12 school leavers now constitute the majority of entrants to TAFE direct from school (see Table 5).

Table 5: School Leavers Who Continued on to TAFE in 1993

<table>
<thead>
<tr>
<th>Highest Year of Secondary School Completed</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 12</td>
<td></td>
</tr>
<tr>
<td>Government</td>
<td>33,400</td>
</tr>
<tr>
<td>Non-government</td>
<td>13,100</td>
</tr>
<tr>
<td>Total</td>
<td>46,400</td>
</tr>
<tr>
<td>Year 10 or 11</td>
<td></td>
</tr>
<tr>
<td>Government</td>
<td>15,200</td>
</tr>
<tr>
<td>Non-government</td>
<td>4,000</td>
</tr>
<tr>
<td>Total</td>
<td>19,200</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
</tr>
<tr>
<td>Government</td>
<td>50,400</td>
</tr>
<tr>
<td>Non-government</td>
<td>17,200</td>
</tr>
<tr>
<td>Total</td>
<td>67,600</td>
</tr>
</tbody>
</table>

Figure 3: Persons Aged 15-24 Who Attended School in 1993, But Were Not Attending School in May 1994

Source: ABS, Transition from Education to Work, Australia, May 1994 (62270)
Higher education remains the major initial destination of Year 12 school leavers. Table 6 records data on the entry of Year 12 students to higher education from 1981 to 1993. Over this period the number of Year 12 school leavers continuing on to higher education has risen by almost 80 per cent— from about 39,000 students in 1981 to 69,000 in 1993. The general trend has been for school leavers to constitute an increasing proportion of undergraduate commencing students (for example, from 36 per cent in 1981 to 45 per cent in 1993). However, since the number of Year 12 students has more than doubled since 1981, the number of commencing higher education places taken up by Year 12 school leavers has not kept pace. The net result is that by 1993 school leavers commencing higher education represented 36 per cent of Year 12 enrolments in the previous year, a fall of several percentage points from the corresponding proportion in the late 1980's. Preliminary evidence for the 1995 academic year suggests an increased proportion of commencing places in higher education being made available to school leavers.

Table 6: Year 12 School Leavers Continuing on to Higher Education, Australia, 1981-93

<table>
<thead>
<tr>
<th>Year</th>
<th>Persons</th>
<th>Annual Growth Rate (per cent)</th>
<th>Female Proportion (per cent)</th>
<th>School Leavers as a Proportion of Total Undergraduate Commencers (per cent)</th>
<th>School Leavers as a Proportion of Year 12 Enrolments in the Preceding Year (per cent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1981</td>
<td>38,600</td>
<td>-2.3</td>
<td>50.3</td>
<td>36.3</td>
<td>43.4</td>
</tr>
<tr>
<td>1983</td>
<td>38,500</td>
<td>2.1</td>
<td>50.4</td>
<td>37.2</td>
<td>42.9</td>
</tr>
<tr>
<td>1985</td>
<td>45,800</td>
<td>9.0</td>
<td>52.0</td>
<td>40.9</td>
<td>41.4</td>
</tr>
<tr>
<td>1987</td>
<td>55,000</td>
<td>12.0</td>
<td>n/a</td>
<td>44.5</td>
<td>42.8</td>
</tr>
<tr>
<td>1989</td>
<td>66,900</td>
<td>11.8</td>
<td>54.5</td>
<td>46.1</td>
<td>41.5</td>
</tr>
<tr>
<td>1991</td>
<td>72,400</td>
<td>1.0</td>
<td>55.4</td>
<td>43.1</td>
<td>42.7</td>
</tr>
<tr>
<td>1993</td>
<td>68,900</td>
<td>5.1</td>
<td>55.9</td>
<td>45.3</td>
<td>35.8</td>
</tr>
</tbody>
</table>


As Figure 3 showed, some 48 per cent of 1993 school-leavers had not enrolled in tertiary education by May 1994. However, there are strong grounds for believing that a high proportion of this particular group will eventually enrol in tertiary education. About 7 per cent of all school leavers indicated that they had deferred tertiary entrance in 1994. An ACER study of Year 12 school leavers who had not enrolled in higher education by their early twenties found that well over half of them expected to return to study (most commonly in TAFE) within the next five years (McKenzie and Alford 1990). Despite the recent decline in Year 12 retention rates, Australia is fast approaching the position where a substantial majority of young people enrol in tertiary education, if not directly from school then at later stages in their working lives.

References

Australian Bureau of Statistics (1994), Transition from Education to Work, May 1994, Cat No. 6227.0, Canberra

Australian Bureau of Statistics (1994), Schools Australia 1994, Cat. No. 4221.0, Canberra


1. Introduction

Dramatic changes have occurred in the full-time full-year workforce in Australia over the last two or three decades. Many of these were charted by Gregory in his 1992 Copland Oration. He showed, for example, that relative to population growth there had been a twenty per cent drop in full-time employment between the mid-1960s and the beginning of the 1990s. However, whilst full-time employment opportunities for females more or less kept pace with the increase in the population, those for males fell by twenty-five per cent (Gregory 1992, pp 12-14).

The compositional changes in full-time employment have been just as dramatic. Between 1968/69 and 1989/90 only just over a million additional full-year full-time jobs were created in Australia, and these were fairly evenly split between men and women (see Table 1). Whilst this amounted to an increase of over fifty per cent in female full-time employment opportunities, it was less than an eighteen per cent increase for males.

Table 1: Full-year Full-time Workforce: Australia, 1968/69 to 1989/90

<table>
<thead>
<tr>
<th></th>
<th>1968/69 (’000)</th>
<th>1989/90 (’000)</th>
<th>Net Increase</th>
<th>Percent Increase</th>
<th>Percent of Inc</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRADUATES</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>116.2</td>
<td>499.5</td>
<td>383.3</td>
<td>329.86</td>
<td>68.74</td>
</tr>
<tr>
<td>Females</td>
<td>25.7</td>
<td>199.8</td>
<td>173.2</td>
<td>673.93</td>
<td>32.48</td>
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<tr>
<td>Persons</td>
<td>141.9</td>
<td>698.4</td>
<td>556.5</td>
<td>392.18</td>
<td>51.02</td>
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<td>Males</td>
<td>3161.8</td>
<td>3719.4</td>
<td>557.6</td>
<td>17.64</td>
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<td>1009.1</td>
<td>1542.3</td>
<td>533.2</td>
<td>52.84</td>
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<tr>
<td>Persons</td>
<td>4170.9</td>
<td>5261.7</td>
<td>1090.8</td>
<td>26.15</td>
<td></td>
</tr>
</tbody>
</table>

Source: See Appendix Table A1
The big gainers, however, were university graduates. They took the lion's share of the expansion in employment over the period. Table 1 shows that, overall, one in every two additional full-time jobs created went to graduates — two out of every three amongst males and one in three amongst females. The number of male graduates in full-year full-time employment grew by more than 300 per cent over the twenty-one year period. The growth for female graduates was almost 700 per cent. In 1968/69 one in twenty-seven males and one in forty females in full-year full-time employment were graduates. By 1989/90 this had risen to one in seven for males and one in eight for females (see Figure 1).

Two of the possible economic consequences of these fundamental changes — for productivity and economic performance, and for the distribution of earnings — have been explored by the author elsewhere (see Maglen 1990, 1991 and 1993). The purpose of this paper is to examine the impact they have had upon the private rates of return on university degrees. Part 2 outlines the elements involved in the estimates, whilst Part 3 presents the results and compares them with those of other relevant studies. Part 4 subjects the estimates to variations in their elements to see how sensitive they are to such variations. Possible reasons for the trends observed amongst the private rates of return are canvassed in Part 5.

Figure 1

Full-Year Full-Time Workforce: Percent with Degrees (1968/69 to 1989/90)

Source: See Appendix Table A 1
2. The Calculations

The standard discounted cash flow technique has been used to calculate the internal rate of return on net cost-benefit streams associated with undertaking a university degree as an alternative to leaving school at various ages and entering the workforce without one. (Data limitations do not permit any distinction between type of course or between first and higher degrees)

Three sets of net cost-benefit streams are estimated for both males and females:

- DEG/LS@18+ is the stream associated with completing a degree, as an alternative to leaving school after completing year 12, at age eighteen (or over), and entering the workforce;

- DEG/LS@17 is the stream associated with finishing secondary school and then completing a degree, as an alternative to leaving school after year 11, at age seventeen, and entering the workforce; and

- DEG/LS@14/15 is the stream associated with finishing secondary school and then completing a degree, as an alternative to leaving school after year 9, at age fifteen (or fourteen), and entering the workforce.

Estimates are made for each of six years over a twenty-one year period: 1968/69, 1973/74, 1978/79, 1981/82, 1985/86 and 1989/90. These are the years for which the Australian Bureau of Statistics (ABS) has conducted income distribution surveys from which the core earnings data used in these calculations have been drawn.

The following assumptions underlie the estimates.

- both school and university courses are undertaken on a full-time basis,

- school-leavers either go on to university or enter the workforce — no other formal education or training courses are undertaken;

- university courses are commenced at age eighteen, and are of three-years' duration,

- no students drop out of their courses without completing, and all complete in minimum time,

- students live at home whilst still at school, and away from home when at university,

- school students do not have any part-time earnings, while university students have jobs over the long vacation; and

- those in the workforce are either in full-time employment or are unemployed — part-time work for graduates and school leavers is ignored

Some of these assumptions are relaxed in part 4 as part of the sensitivity testing of the results.

The basic component of the cost estimates is the age-specific average annual full-year full-time gross earnings of the respective school leaver cohorts, that students forego when furthering their studies. These are then adjusted for the following factors...
• average taxation rates by level of income,
• costs of books, consumables, tuition fees, etc,
• average living allowances (and any additional allowances) paid under Austudy and its predecessors (TEAS, Commonwealth University Scholarship Scheme. Note that in 1968-69 students had to be awarded a scholarship before they were entitled to a living allowance);
• net earnings from long vacation employment when an undergraduate, and
• unemployment — annual rates/average duration/benefits payable.

The basic component in the benefit estimates is the age-specific average annual full-year full-time gross earnings of graduates and the respective school leaver cohorts. These are adjusted for the following factors.

• average taxation rates by level of income,
• unemployment — annual rates/average duration/benefits payable, and
• Higher Education Contribution Scheme (HECS) payments, for 1989/90 only — it is taken that students elect to defer payment.

The resulting adjusted net earnings streams are then used to calculate the differentials that graduates enjoy over the three respective school leaver cohorts. These adjusted net earnings differentials are then further adjusted to allow for:

• the ‘alpha' coefficient — that is, that proportion of the differential associated with having a degree that can be assumed to be due to that degree. As there is no Australian estimate of this coefficient available, the figure of 0.8 was used since this is broadly in line with that used elsewhere — for a review, see Psacharopoulos (1975) and Hinchcliffe (1987); and

• long-run growth in real earnings. Earnings differentials can be expected to widen over time because of the growth in average labour productivity. An estimate of 2.7 per cent per annum is used here, in line with Australian experience since the late 1960s — see Economic Planning Advisory Council (1986).

The impact that these various adjustment factors used in the cost and benefit estimates have on the rates of return is examined in Part 4.

The principal data sources are the ABS publications containing statistics drawn from its six periodic income distribution surveys. Other ABS publications are used to supplement these, as are other Australian Government publications emanating from the Taxation Office, the Department of Social Security, the Department of Employment, Education and Training and its predecessors. Data sources are listed at the end of this paper.
3. The Results

Table 2 and Figures 2 and 3 present the 'fully adjusted' private rate of return calculations for both males and females, on university degrees over leaving school at each of the three ages, for each of the six survey years.

Table 2: Private Rates of Return on a University Degree
Australia: 1968/69 to 1989/90

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>MALES</strong></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>DEG/LS@18+</td>
<td>19.97</td>
<td>20.73</td>
<td>19.97</td>
<td>19.56</td>
<td>15.02</td>
<td>20.11</td>
</tr>
<tr>
<td>DEG/LS@17</td>
<td>18.02</td>
<td>18.11</td>
<td>16.13</td>
<td>14.99</td>
<td>13.52</td>
<td>13.48</td>
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<td>13.66</td>
<td>12.34</td>
<td>12.35</td>
<td>12.92</td>
</tr>
<tr>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEG/LS@18+</td>
<td>24.11</td>
<td>20.12</td>
<td>20.16</td>
<td>15.41</td>
<td>15.51</td>
<td>18.09</td>
</tr>
<tr>
<td>DEG/LS@17</td>
<td>18.19</td>
<td>19.56</td>
<td>13.73</td>
<td>13.97</td>
<td>13.18</td>
<td>12.05</td>
</tr>
<tr>
<td>DEG/LS@14-15</td>
<td>15.91</td>
<td>15.41</td>
<td>13.19</td>
<td>12.24</td>
<td>12.91</td>
<td>11.74</td>
</tr>
</tbody>
</table>

where: DEG/LS@18+ = a degree over leaving school at age 18 or more
       DEG/LS@17  = a degree over leaving school at age 17
       DEG/LS@14-15 = a degree over leaving school at age 14 or 15

The salient features of these results are.

- all rates were lower in 1989/90 than they had been twenty-one years before. For the most part the decline has been continuous, although one or two rates rose again at the end of the period. The falls that occurred were most dramatic in the 1970s;
- the longer the investment period the lower the rates of return. The highest rates are those on degrees over leaving school at eighteen, the lowest on degrees over leaving school three or four years earlier. The extra benefits generated do not fully compensate for the extra costs involved. Of the three sets of rates, however, the most volatile, and the least reliable, are those associated with school-leavers age eighteen and over;
- private rates of return on university degrees for males and females are very similar, and have exhibited the same trends over the period; and
- despite the decline in the rates they still constitute a good return on an individual's investment. The lowest rate shown in Table 2 is just under twelve per cent and it is unlikely that any reasonable 'alternative rate of return', available to students or their families would have greatly exceeded that level, even in the boom period of the 1980s.
Figure 2

Private Rates of Return on Uni Degrees
Males, Australia: 1968/69 to 1989/90

Figure 3

Private Rates of Return on Uni Degrees
Females, Australia: 1968/69 to 1989/90
The only previous Australian studies with which to compare these results are those conducted by Miller (1984) and Chia (1991). Their estimates, for males only, were as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Miller</th>
<th>Chia</th>
</tr>
</thead>
<tbody>
<tr>
<td>1968/69</td>
<td>24.0</td>
<td>17.2</td>
</tr>
<tr>
<td>1973/74</td>
<td>22.4</td>
<td>16.2</td>
</tr>
<tr>
<td>1978/79</td>
<td>19.4</td>
<td>14.9</td>
</tr>
<tr>
<td>1982/83</td>
<td>(18.3)</td>
<td></td>
</tr>
<tr>
<td>1985/86</td>
<td>(16.8)</td>
<td></td>
</tr>
</tbody>
</table>

(The figures in parentheses are by Chia using the same procedures as Miller).

Their rates are generally higher than those estimated in this study. It would appear (although it is never clearly spelt out) that neither of them adjusted the gross earnings data for as many factors as has been attempted here. Nevertheless they are not greatly different, and they too clearly track the decline in private returns on university degrees over the period.

How do these Australian results compare with the private rates of return earned on degrees elsewhere? Haddad et al (1990, Table 2, pp 7-9) present the estimated private rates of return to males' higher education taken from studies in sixteen countries comparable to Australia. The results from this present study fall well within the range observed by Haddad et al and have remained above their mean rate of twelve per cent. This latter figure accords with the mean of 12.4 per cent Leslie and Brinkman (1988, Table 4.2, p 47), calculate from a review of forty-three studies of the private rates of return on first degrees earned by males in the United States.

It would appear, however, that the trend in Australia is in the opposite direction to that observed in the United States. Haddad et al present figures calculated by Carnoy et al (1988) which indicate that the private rates of return for males on their higher education rose continuously from about eleven per cent in 1969 to fourteen per cent in 1985. Leslie and Brinkman's findings are that male private rates of return on first degrees actually fell from an average of thirteen per cent in 1969 to 11.7 per cent in 1973, but rose again to 16.5 per cent in 1980.

4. Sensitivity Tests

The "fully adjusted" rates of return given in Table 2 can be decomposed to show the impact upon them of the various elements used in their estimation. This is done in Table 3, using as the benchmark the rates of return on degrees over leaving school at age seventeen.

The salient features of this table are:

- changes in gross earnings differentials were the prime mover in changes in the fully adjusted rates of return. This is clearly evident in Figure 4, and it appears to have been especially the case during the period of rapid decline in the rates over the 1970s;

- while income tax differences lower both cost and benefit streams, their net effect was to lower rates of return by about two or three percentage points;

- adjusting for the possibility of unemployment also lowered both the cost and benefit streams, but the impact was greater on the former than on the latter. The net effect was that it raised the private rates of return on a university degree;
Table 3: Private Rates of Return: Degree/Leaving School at Age 17

<table>
<thead>
<tr>
<th></th>
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<td></td>
<td></td>
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<tr>
<td>NET</td>
<td>17.88</td>
<td>17.96</td>
<td>14.07</td>
<td>12.39</td>
<td>11.02</td>
<td>11.63</td>
</tr>
<tr>
<td>NETF'</td>
<td>18.01</td>
<td>18.07</td>
<td>15.95</td>
<td>14.58</td>
<td>12.93</td>
<td>12.83</td>
</tr>
<tr>
<td>B''</td>
<td>18.02</td>
<td>18.11</td>
<td>16.13</td>
<td>14.99</td>
<td>13.52</td>
<td>13.48</td>
</tr>
<tr>
<td>B' ~ only</td>
<td>15.63</td>
<td>15.73</td>
<td>13.75</td>
<td>12.56</td>
<td>11.09</td>
<td>11.03</td>
</tr>
<tr>
<td>B' g only</td>
<td>20.36</td>
<td>20.41</td>
<td>18.29</td>
<td>16.96</td>
<td>15.31</td>
<td>15.24</td>
</tr>
<tr>
<td>B'' max LA</td>
<td>21.45</td>
<td>20.34</td>
<td>17.59</td>
<td>16.05</td>
<td>14.64</td>
<td>15.17</td>
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<tr>
<td>B'' no LA</td>
<td>15.73</td>
<td>15.40</td>
<td>13.29</td>
<td>12.78</td>
<td>11.47</td>
<td>11.55</td>
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<tr>
<td>GE</td>
<td>20.16</td>
<td>22.15</td>
<td>13.69</td>
<td>13.93</td>
<td>12.09</td>
<td>11.81</td>
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<tr>
<td>NET</td>
<td>18.61</td>
<td>20.02</td>
<td>11.55</td>
<td>12.34</td>
<td>10.50</td>
<td>9.74</td>
</tr>
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<td>NETF'</td>
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<td>13.67</td>
<td>13.35</td>
<td>12.82</td>
<td>11.14</td>
</tr>
<tr>
<td>B''</td>
<td>18.19</td>
<td>19.56</td>
<td>13.73</td>
<td>13.97</td>
<td>13.18</td>
<td>12.05</td>
</tr>
<tr>
<td>B' ~ only</td>
<td>15.95</td>
<td>17.33</td>
<td>11.41</td>
<td>11.53</td>
<td>10.83</td>
<td>9.58</td>
</tr>
<tr>
<td>B' g only</td>
<td>20.96</td>
<td>22.36</td>
<td>15.91</td>
<td>15.76</td>
<td>15.13</td>
<td>13.59</td>
</tr>
<tr>
<td>B'' max LA</td>
<td>24.22</td>
<td>23.06</td>
<td>15.32</td>
<td>15.01</td>
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<td>13.55</td>
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<tr>
<td>B'' no LA</td>
<td>14.69</td>
<td>15.71</td>
<td>10.85</td>
<td>11.76</td>
<td>10.76</td>
<td>10.31</td>
</tr>
</tbody>
</table>

where: GE = gross earnings, unadjusted
NET = net earnings, unadjusted
NETF' = net earnings, adjusted for unemployment
B'' = net earnings differentials, adjusted for unemployment, an 'alpha' factor and real growth in earnings, and assuming average living allowance
B' ~ only = B'' not adjusted for long-term growth
B' g only = B'' not adjusted for an 'alpha' factor
B'' max LA = B'' assuming maximum living allowances, not average living allowances
B'' no LA = B'' assuming no living allowances.
the 'alpha' coefficient and the real growth adjustment virtually cancelled each other out;

- the removal of the long-run real growth adjustment lowered the rates by over two percent (but by less than 27 percent);

- not applying the 'alpha' coefficient (of 0.8) raised the rates by about one and a half to two percentage points; and

- the level of student assistance received clearly had a marked effect upon the rates of return. Figure 5 shows that — depending upon whether students received the maximum living allowance, the average allowance or no allowance at all — private rates of return on a university degree could vary anywhere between three and nine percentage points.

The rates can be further tested for their sensitivity by varying the assumptions regarding student dropout rates, average length of course, and how the HECS payment is made. This is done, for 1989/90 only, in Table 4.

**Table 4: Private Rates of Return on a University Course — 1989/90**

<table>
<thead>
<tr>
<th>Over leaving school at:</th>
<th>18+</th>
<th>17</th>
<th>14/15</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>males</td>
<td>females</td>
<td>males</td>
</tr>
<tr>
<td>3 Years to Graduate</td>
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<td></td>
</tr>
<tr>
<td>HECS paid up front</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>zero dropout rate</td>
<td>19.62</td>
<td>16.61</td>
<td>13.05</td>
</tr>
<tr>
<td>HECS payment deferred</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>zero dropout rate</td>
<td>20.11</td>
<td>18.09</td>
<td>13.48</td>
</tr>
<tr>
<td>27% dropout rate</td>
<td>19.34</td>
<td>16.51</td>
<td>11.99</td>
</tr>
<tr>
<td>35% dropout rate</td>
<td>19.12</td>
<td>16.07</td>
<td>11.52</td>
</tr>
<tr>
<td>4 Years to Graduate</td>
<td></td>
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</tr>
<tr>
<td>HECS paid up front</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>zero dropout rate</td>
<td>18.49</td>
<td>13.68</td>
<td>11.61</td>
</tr>
<tr>
<td>HECS payment deferred</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>zero dropout rate</td>
<td>18.95</td>
<td>14.97</td>
<td>12.01</td>
</tr>
<tr>
<td>5 Years to Graduate</td>
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</tr>
<tr>
<td>HECS paid up front</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>zero dropout rate</td>
<td>17.68</td>
<td>11.98</td>
<td>10.48</td>
</tr>
<tr>
<td>HECS payment deferred</td>
<td></td>
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</tr>
<tr>
<td>zero dropout rate</td>
<td>18.11</td>
<td>12.97</td>
<td>10.85</td>
</tr>
</tbody>
</table>
Figure 4

Private Rates of Return on Deg/LS@17 Males: Fully Adjusted Compared to GE Only

Figure 5

Private Rates of Return on DEG/LS@17 Males: by Level of Student Assistance
The salient features of this Table are:

- paying HECS upfront — even with the discount of fifteen percent — does not appear to pay-off, for doing so actually lowers the rates of return (see also Chapman and Chia 1989);

- increasing the length of course both increases costs and reduces the stream of benefits. The combined effect is to lower rates of return by about one per cent for each additional year taken over the degree. The minimum length of course in Australia varies between three and six years, but despite the changes in the composition of enrolments between courses, the average length of course has remained at about 3.3 years. The average amount of time students actually take to complete their courses is unknown, but is likely to be a good deal longer than this; and

- dropping out before completing the degree can mean that some or all of the costs are incurred, but none or very little of the benefits accrue. Studies conducted in Australia suggest that student dropout rates at university could range between 27 and 35 percent (see Williams Report 1979, Vol. 2 and West et al 1986). The same studies also reveal that the first year of a course is the biggest hurdle; about twenty percent of students do not proceed any further. Table 4 shows that these dropout rates can lower the private rates of return by around two percentage points.

What these sensitivity tests reveal is that, whilst it is the movement in gross earnings differentials associated with a degree that has been most instrumental in causing the changes in the rates of return over the period, variations in factors affecting the costs of doing a degree (such as living allowances, the length of time taken or the possibility of dropout) potentially have the greatest effect on variations in rates of return between individuals.

5. Interpretation

Private rates of return on university degrees are particularly sensitive to two sets of influences: (a) factors such as the level of student assistance, the length of course and the dropout rate etc. that impact upon costs; and (b) movements in the gross earnings differential that graduates can command. The first, whilst being crucially important to differences in rates of return between individuals, do not appear to have brought about substantial changes in the rates over time. The second set of influences, however, have played the dominant role in bringing about changes in the overall rates over time.

To underscore this point Figures 6 and 7 show the trends in gross full-year full-time earnings differentials between 1968/69 and 1989/90. There is a close similarity between these trends and the trends in the private rates of return shown in Figures 2 and 3. However, graduate earnings differentials also appear to display something of a countercyclical tendency.
Figure 6

Male Graduate Earnings Differentials
(School-Leaver Earnings = 100)

Figure 7

Female Graduate Earnings Differentials
(School-Leaver Earnings = 100)
Figure 8 charts the movement in male real wages in Australia over the same period. During the 1970s when real wages were growing strongly graduates fared comparatively poorly. This was when their earnings differentials, and hence rates of return, fell most rapidly. The period of real earnings slowdown in the late 1970s and early 1980s was when the fall in graduate differentials tapered off, and for females when it was arrested completely. The Accord of the middle to late 1980s saw real earnings decline, and this was the period when graduate earnings differentials, and the private rates of return on university degrees, started to rise again.

Figure 8

Male Real Earnings — Australia
(At 1968 Prices: 1968 = 100)

Sources: ABS, Average Weekly Earnings, Australia: 1941 to 1990, Cat. No. 6350.0
ABS, Yearbook Australia, 1991, Cat. No. 1301.0.

One possible explanation for this is that the growth in graduate earnings has been much more steady than that of non-graduate earnings, so that in relative terms the differential between the two narrows during periods of earnings breakout and widens again in periods of stagnation. However, why this should be so, especially in the light of the huge comparative growth in graduate employment, requires further investigation.
APPENDIX

TABLE A.1 FULL-YEAR FULL-TIME WORKFORCE: AUSTRALIA, 1968/69 TO 1989/90. THOSE WITH DEGREES, AND THOSE WHO LEFT SCHOOL AT SELECTED AGES WITHOUT ONE.

<table>
<thead>
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<tbody>
<tr>
<td><strong>MALES</strong></td>
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<td>Degree</td>
<td>116.2</td>
<td>147.3</td>
<td>255.8</td>
<td>296.1</td>
<td>371.1</td>
<td>499.5</td>
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<td>Left school at 18+</td>
<td>133.1</td>
<td>137.3</td>
<td>116.4</td>
<td>139.4</td>
<td>185.3</td>
<td>223.2</td>
</tr>
<tr>
<td>Left school at 17</td>
<td>186.8</td>
<td>221.8</td>
<td>200.1</td>
<td>238.3</td>
<td>272.3</td>
<td>303.7</td>
</tr>
<tr>
<td>Left school at 14/15</td>
<td>1256.6</td>
<td>1125.5</td>
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<td>4.47</td>
<td>8.15</td>
<td>9.10</td>
<td>10.69</td>
<td>13.43</td>
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<tr>
<td>Degree</td>
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<td>33.5</td>
<td>58.8</td>
<td>83.8</td>
<td>151.7</td>
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<td>Left school at 18+</td>
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<td>40.3</td>
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<td>82.2</td>
<td>97.4</td>
<td>125.8</td>
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<td>420.4</td>
<td>331.9</td>
<td>286.7</td>
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<td>1099.8</td>
<td>1132.1</td>
<td>1098.3</td>
<td>1271.3</td>
<td>1542.3</td>
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<tr>
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<td>2.55</td>
<td>3.05</td>
<td>5.19</td>
<td>7.63</td>
<td>11.93</td>
<td>12.90</td>
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TABLE A.2 RELATIVE GROSS EARNINGS DIFFERENTIAL\(^*\) ASSOCIATED WITH HOLDING A DEGREE: 1968/9 TO 1989/90

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<td>173.7</td>
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<td>199.7</td>
<td>169.8</td>
<td>169.7</td>
<td>170.4</td>
<td>170.9</td>
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</table>

Notes:  
\(^*\) using average gross earnings figures for full-year full-time workers  
\(^\dagger\) differential for degree and non-degree tertiary qualifications.
Data Sources

• Workforce and Gross Earnings


   (b) 1973/74: ABS, *Social Indicators No 3, 1980*, ABS Cat No. 41010


   (d) 1981/82: ABS, *Social Indicators No 4, 1984*, ABS Cat No 41010


• Taxation


• Unemployment Rates and Duration


• Unemployment Benefits


• Student Costs


• **Student Assistance**


• **Student Dropout Rates**


• **'Alpha' Coefficient**


• **Longrun Growth in Real Earnings**


ABS, *Yearbook Australia, 1991*, ABS Cat No. 1301 0

Other References


Maglen, L. (1990), 'Challenging the Human Capital Orthodoxy: The Education-Productivity Link Re-examined', The Economic Record, 66, 195, December

