

## SECONDARY SCHOOLING, TERTIARY ENTRY RANKS AND UNIVERSITY PERFORMANCE

**Ian R Dobson and Eric Skuja**

*A large proportion of students competing for first year university places are selected on the basis of their Year 12 performance according to the Equivalent National Tertiary Entry Rank (ENTER). The ENTER ranks each student in relation to all other students. Year 12 students strive to achieve the highest ENTER possible, in order to optimise their choice of university and course. Students from Government schools produce lower ENTERs (on average) than students from other types of schools. One also reads, from time to time, that high ENTERs are not a good predictor of university success. This paper examines the situation at the start of the twenty-first century, using Monash University as a case study.*

### INTRODUCTION

Many more students now attend university than was the case in the past. The Dawkins 'revolution' opened up university to many who had previously been excluded. One group which has always made up a relatively low proportion of the university population has been students from low socioeconomic status backgrounds. This group is defined in the Commonwealth equity scheme as those from the 25 per cent of postcodes at the bottom of the socio-economic hierarchy. They typically provide in the order of 15 to 16 per cent of all student enrolments. The proportion of low socio-economic status undergraduates in Medicine, perhaps the most difficult course to gain entry to, represented less than nine per cent in 2001.<sup>1</sup> The situation was little better in law courses, in which the proportion of these students in 2001 represented less than 11 per cent.<sup>2</sup> There has been little change in this situation over the past two decades.

Clearly students from the lower end of the socio-economic scale have not been beneficiaries of policies which have been set in place to improve access to the university sector. A number of variables are important in analysing this issue, including Year 12 entry ranks (ENTERs) and the influence on these exercised by the type of school Year 12 students attend.

Secondary schooling in Australia is provided by Government and non-Government schools, with the latter comprising systemic Catholic schools, and what are referred to as Independent schools. The majority of Government schools are 'non-selective', co-educational schools, attended in the main by students residing locally. There are two 'selective' Government secondary schools, both of which are single sex, and one each for boys and girls. There are about eight or nine non-selective Government schools for girls, but none for boys. Government sector schools charge no fees for tuition, but a wide range of fees is charged by non-Government schools. Most Catholic schools charge modest fees, but many within the Independent category charge fees which are out of the reach of most families.

It is no longer a secret that students from Independent schools achieve (on average) much higher ENTERs than their counterparts from Catholic or non-selective Government secondary colleges.<sup>3</sup> ENTERs rank each student compared with other students, and the highest rank which can be achieved is 99.95. Analysis by Birrell et al., showed that the median ENTER in 2000 gained by Victorian students from Independent schools was 84.20, compared with 69.65 and 62.80 for Catholic and Government school

students (selective and non-selective), respectively.<sup>4</sup> The higher the ENTER achieved by Year 12 students, the more university choices are available to them. Entry to high-demand/ high-status courses such as medicine and law is particularly dependent on a student gaining an ENTER in the very high 90s. Although individual students from all school types gain high ENTERs, on average students from Victoria's two selective schools in the Government sector and from Independent schools reign supreme in producing high ENTERs. There is often debate as to the reasons for the lower aggregate results achieved by Government and Catholic schools, together with suggestions that ENTERs are not necessarily a good predictor of success at university. These issues are examined below.

In order to test theories about students' Year 12 success and subsequent university performance, Monash University has been used as a case study. Monash is Australia's largest university, and offers courses in most fields of education. As Evans and Farley say, 'Monash... may be viewed as a microcosm of the higher education sector in Australia and an appropriate "laboratory" for analysing key factors and institutional differences'.<sup>5</sup> It is also an elite university but, in 'pecking order' terms, most statistics indicate that Monash is second behind the University of Melbourne in terms of its capacity to attract Year 12 students with the highest ENTERs. It should also be noted that an assumption implicit in this analysis is that winning a university place is the sole aim of Year 12 students. We acknowledge that this is not the case for everyone, and that gaining a high ENTER is not the only reason why parents might wish their children to attend particular schools.

Relatively little has been written recently on the quantitative link between

Year 12 and the first year of university, as measured by entry scores (ENTERs in this case). This paper therefore examines the issue on two main fronts. First, do ENTERs still have value as a predictor of university performance during their first year of study? And second, do the relatively high performing selective Government and Independent school students maintain their ascendancy when they take up university studies. Or do students from less privileged secondary school backgrounds catch up on the level university 'playing field'?

### **ENTERs as a predictor of success at university**

Is the ENTER a good predictor of university performance? Some observations from the literature are reported here, followed by an analysis based on four years' data at Monash University.

Dobson and Sharma conducted a study of the relative performance of several different paired groups of students attending all of Victoria's universities and colleges of advanced education in 1991, including a comparison of students who had gained high scores in the Victorian Higher School Certificate (HSC) with those achieving lower scores. They found that high scores in Year 12 were a *prima facie* predictor of university performance, with students scoring 320 or higher (out of a possible 420) passing more of their university subjects than students with Year 12 scores less than 280.<sup>6</sup>

ENTERs were introduced in 1995 and elements of this result were supported by Evans and Farley's mid-1990s study (at Monash University), which also noted the strong link between secondary school academic results and subsequent tertiary performance. They reported that 'students' [ENTERs] appeared significant

in explaining the variation in their university marks in all cases when it was the sole explanatory variable'.<sup>7</sup>

Further support for this view came from a 2001 Queensland study, which reported on a range of research which suggested that the most significant predictor of university performance is previous academic performance.<sup>8</sup>

Another study, this time based on cohorts of RMIT students in 1995, 1996 and 1997, found that students with an ENTER above 80 showed a strong positive correlation between ENTER and university performance, whereas the correlation for ENTERs between 40 and 80 was nil, and for those below 40 was variable.<sup>9</sup>

A more recent study, based around a foundation program for students who might not normally have got into university, put a contrary view. Levy and McMillan found that students with low entrance scores can perform just as well as higher ranked students at university when given extra support.<sup>10</sup>

Statistically, the relationship between secondary school and university performance is influenced by a number of extraneous factors. In this study we controlled for a large proportion of measurement error in several ways. First, the analysis was restricted to full-time, domestic students enrolled in bachelor courses who had completed Year 12 the previous year at a Government, Catholic or Independent school. In short, something like 42 per cent of commencing students were excluded, being those who used some form of deferred, alternative or international entry pathway into Monash. Students studying part-time or at sub-degree level were also excluded. Second, we excluded a further two per cent of students with zero or extremely low end-of-year university grades (less

than 10 out of 100) on the assumption that these students had withdrawn during the academic year without completing required assignments and examinations. In all, the analysis was based on 12,543 students or just over 3,000 students in every intake during the four-year period 2000 to 2003. What do the Monash outcomes reveal?

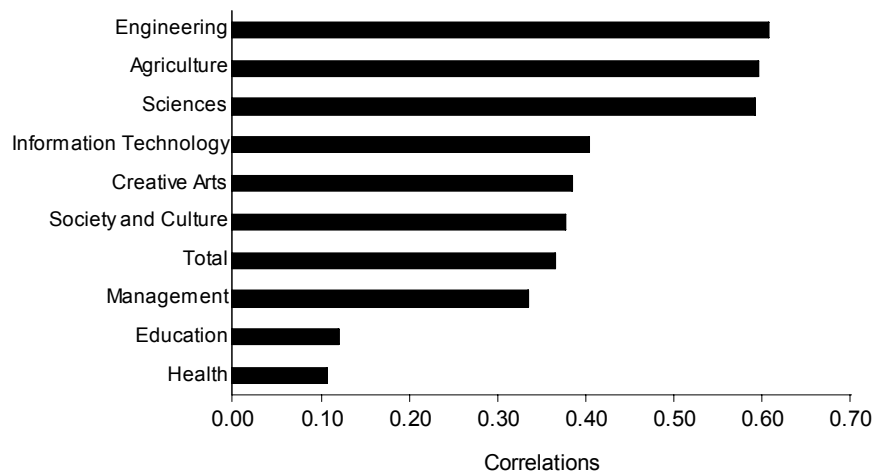
The correlation between ENTER scores and students' first year grades has been remarkably consistent at Monash during the period 2000 to 2003 ( $r=0.37$ ). As in earlier studies, the correlation is negligible for ENTERs below 80 ( $r=0.04$ ) but there is a strong linear relationship between Year 12 ENTERs and university performance above that level ( $r=0.38$ ). However, there are significant variations. Figure 1 shows the relationship between ENTERs and first-year marks by field of education.

The figure shows that ENTERs are clearly a very good predictor of performance in engineering, agriculture and science ( $r=0.59$  to  $0.61$ ). The correlations are about average in information technology, creative arts and in the humanities courses clustered under society and culture ( $r=0.38$  to  $0.40$ ). The relationship is weaker in management courses ( $r=0.33$ ) and virtually non-existent in education ( $r=0.11$ ) and health ( $r=0.10$ ). One possible interpretation of this pattern is that the value of ENTERs as a selection tool diminishes as the discipline area moves away from the subjects taught to students at secondary school.

### **ENTERs and the influence of secondary schooling on university performance**

Do students from Government schools perform worse than students from other types of school in Year 12, but thereafter excel in university studies? There is

**Figure 1: Correlations between Year 12 ENTERs and university marks by field of education, 2000 to 2003**



Source: Monash University

controversy at the university level concerning outcomes by school origin, and this is rightly considered to be a significant issue. If students from non-selective Government schools really do better on the level playing field, it has significant implications for universities' admissions and equity policies. After a brief consideration of the literature on the topic, this proposition is also tested using Monash as a case study.

A paper was published by West in 1985 relating specifically to students entering Monash University.<sup>11</sup> Based on three years' analysis, West concluded that students from Government schools performed better in their first year at university than students with the same selection score from Independent schools: 'On average, students from Government schools perform as well as those from Independent schools who have a selection score in the order of 10

to 25 marks higher'.<sup>12</sup>

West conceded that his statistical analysis gave no indication of the causes of this phenomenon, but he conjectured that perhaps Independent schools coached less able students to over-achievement in the HSC examination, or that 'survival' in the Government sector breeds greater independence in students.<sup>13</sup> This is a provocative idea but, although now widely believed, it is rarely investigated. It may be seen as plausible, given the emphasis of private schools on cultivating achievement and on their competitive academic environment. One wonders, though, why students trained in such competitive environments failed to bring this competitive spirit to their university studies.

The differential between Independent and Government schools was also noted by Evans and Farley in their study at Monash.<sup>14</sup> They estimated an average difference in academic performance in

first-year university subjects of between two to eight marks in favour of Government school students.

Prominent coverage of this issue late last year, by *Sydney Morning Herald* and *Age* economics commentator Ross Gittins, has put the issue up in lights. Gittins' piece was based on the results of two studies from Western Australia. These studies show that students from Government schools do better in their first year at university than do students from Independent schools.<sup>15</sup> The Western Australian studies, reports Gittins, suggested a turnaround between the end of Year 12 and the end of first-year university. 'Taking students with the same ENTER, those from Government schools outperformed those from Catholic schools, with the Catholic kids out-performing those from Independent schools'.<sup>16</sup> As was the case with West's research, Gittins concludes that the superior resources and more attentive coaching of non-government schools serve to artificially inflate students' ENTERs relative to their raw abilities.

There have been similar debates in the British higher education sector, which has also gone through an examination of the relative university outcomes of students from different types of school. In the British system, research found that students from Government-funded schools achieved lower Year 12 outcomes (A-levels) than students from Independent schools, but nonetheless performed better at university. Students from the Government sector, 'were more likely to get a good degree than similar students with similar A-Level grades, from Independent schools'.<sup>17</sup> Those responsible for the study reported nonetheless that A-level points were the single most important factor in determining the expected HE [higher

education] achievement.<sup>18</sup>

The pattern of A-level performance and its lack of correlation with university performance is such that some British commentators are calling for 'affirmative action' for students from Government schools at the point of entry to university. As reported by the BBC, 'some argue that pupils from state schools should be given lower offers than those at independent schools'.<sup>19</sup>

So now there is a common theme. Private school students are advantaged by the resources devoted to their education at secondary school, but this advantage evaporates at university. At this point, so it is implied, the talent of Government school students starts to shine through. The data below examine student performance at university, according to the type of school they attended, and test the proposition that a private school background confers an ephemeral advantage.

The population analysed for this study was full-time domestic students enrolled in bachelor degrees. The student population has been divided into ENTER bands according to school type. Table 1 looks at Monash's intake in 2003 for all campuses. It has been assumed that there is no variation in the standards required of students at the various campuses.

The table confirms the over representation of students from Independent and Catholic schools. In 2002, Independent school students represented less than 20 per cent of all Year 12 students who applied for a place at university or a college offering Technical and further Education (TAFE),<sup>20</sup> but made up 35 per cent of Monash entrants in 2003. Equivalent figures for Catholic and Government Year 12 enrolments were 22 per cent and 59 per cent, respectively, compared with their presence in the 2003

**Table 1: Monash University: equivalent full time domestic students commencing bachelor degrees in 2003 by ENTER band and school type, per cent**

ENTER band	School Type					Total per cent	Total No.
	Government: Non-Selective	Government: Selective	Catholic	Independent			
< 70.00	4.50	0.00	1.70	1.10	2.40	75	
70.00-79.95	20.50	6.80	20.60	12.70	17.20	531	
80.00-84.95	16.70	6.10	18.20	13.80	15.60	482	
85.00-89.95	21.70	12.10	22.80	19.60	20.80	643	
90.00-94.95	22.80	31.10	23.10	28.40	25.20	778	
95.00-99.95	13.80	43.90	13.70	24.40	18.80	579	
<b>Total</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>3088</b>	
Per cent 90.00+	36.60	75.00	36.80	52.80	43.90		
Total - No.	1117	132	759	1080	3088		
Total - per cent	36.20	4.30	24.60	35.00	100.00		

Source: Monash University

Monash intake of 25 per cent and 40 per cent, respectively.

Table 1 also indicates that there is a marked difference in the proportions of students gaining high ENTERs according to the type of schools they attended. About 37 per cent of the new Monash students shown who were from either Catholic schools, non-selective Government schools or achieved ENTERs of 90 or higher, compared with about 53 per cent of Independent school students and 75 per cent of students from selective Government schools.

Thus the pattern at point of entry to Monash is quite plain, with the 'best' students (in terms of their Year 12 attainment) being drawn from selective Government schools or from Independent schools.

#### **Performance at university**

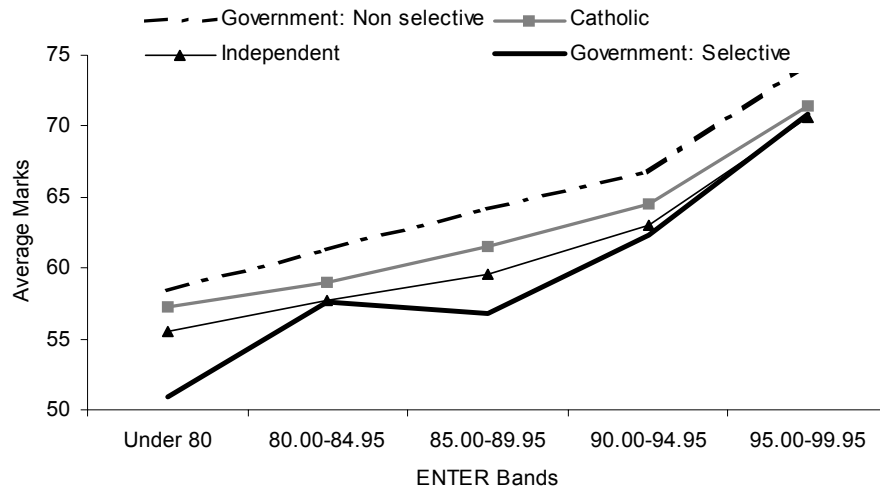
It was noted above that Independent schools are alleged to be good at producing high ENTERs for their Year 12 students but that, when left to their own devices, these students do not

always perform commensurately at university. As Gittins put it, 'the private schools' "value added" is short lived'.<sup>21</sup> Is this true? In part the answer is 'Yes'.

Figure 2 shows that students from non-selective Government schools recorded higher marks during their first year at university than students from other school types in nearly all ENTER bands. This is surprising given the entry point pecking order in secondary school performance, from selective Government, to Independent, Catholic, then Government schools. Figure 2 shows that, by the end of first year university this pecking order had been neatly reversed. Although anecdote had suggested that this occurred with students from Independent schools, it had never been suggested that the same reversal would occur to students from selective Government schools. It should be noted however, that 75 per cent of students from selective Government schools achieved ENTERs of 90 or higher.

One other important observation can be made from the data in Figure 2. Students from non-selective Government

**Figure 2: Monash University commencing students, 2000 to 2003: average markd at the end of first year, by school type, and ENTER band**



Source: Monash University

schools performed at a similar level during their first year at Monash as students from Catholic and Independent schools who scored five ENTER points higher at school. The same pattern can be seen in all ENTER bands below 95. For instance, at the end of first year non-selective Government school students admitted with ENTERs in the 85.00 to 89.95 range recorded about the same grades (64.1) as Catholic (64.6), Independent (63.0) and selective Government (62.3) school students admitted with ENTERs in the 90.00 to 94.95 range.

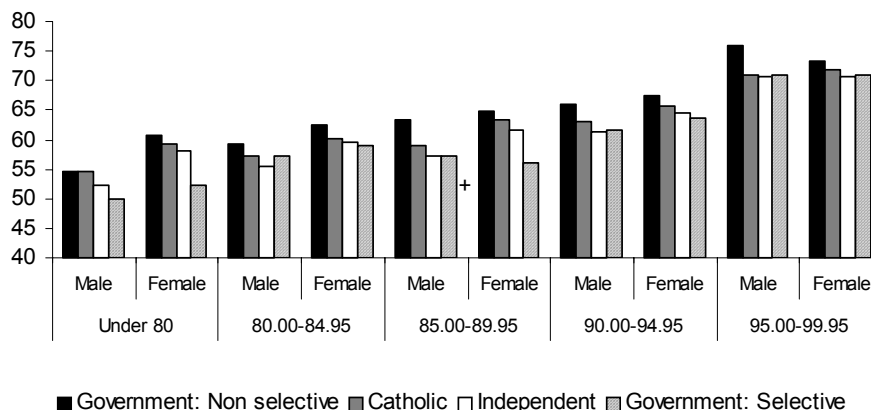
These findings are consistent with the argument that private schools add value to students of similar ability who attend non-selective Government schools. Once on a level playing field, students from non-selective Government schools tend to do better. Again, this pattern is similar to that identified by British researchers. To some extent, selective Government

schools, with better resourcing and a culture of academic excellence, are akin to schools in the Independent sector.

#### The influence of sex

The academic superiority of female over male students, at school and at university, has been noted in several pieces of work.<sup>22</sup> Overall patterns of gender-based performance at university by Year 12 ENTER bands and school type are shown in Figure 3. As can be seen, only in the top ENTER band (95.00 to 99.95) do any male students out perform their female counterparts. This result occurs in the case of students from non-selective Government schools. In general, however, it is female students who (on average) gain higher marks. Female students from non-selective Government schools significantly outperformed male students at all ENTER bands below 85, but their performance was not statistically

**Figure 3: Average marks at the end of first-year university, by sex, ENTER band and school type, 2000 to 2003**



Source: Monash University

significant for ENTERs between 85 and 95. Females from both Catholic and Independent schools significantly outperformed their male counterparts at all but the highest ENTER band (where the difference was not significant). For students from selective Government schools, there was no statistically significant difference in gender performance within any ENTER band.

Comparing the university performance of male students from different types of school, those from non-selective Government schools recorded statistically significant higher marks than males students, from Independent schools at ENTER levels of 80 or above. For ENTERs of 85 and above, male students from non-selective Government schools outperform males from both Independent and Catholic schools, and for ENTERs above 90, they outperformed male students from all types of schools. School type had no effect on male students'

university performance at ENTER levels below 80. Despite the visual appearance of the Under 80 ENTERs in Figure 3, the result is not statistically significant, in part due to the small number of students from Selective Government schools with ENTERs in this range.

In the case of female students, those from non-selective Government schools generated higher marks at all ENTER bands than females from other school types. These results were statistically significant in the case of comparison with female students from Independent schools but not with students from Catholic and selective Government schools.

### Conclusion

This paper sought to establish whether or not there was predictive value in the ENTERs gained by students at Year 12, and whether students from non-selective Government schools outperformed



students from other types of secondary school students when they were at university. On the basis of an analysis of several years' data at Monash, the answer to both questions is a qualified 'Yes'. For ENTERs above 80.00, the average number of marks earned at the end of first year university increased steadily, but ENTER is not a particularly good predictor of performance in information technology, creative arts, the humanities or business courses and is a poor predictor of performance in the health and education areas.

As to university outcomes based on students' secondary school education, analysis of data for Monash University reveals that there was a differential of around five marks at the end of first year between students from non-selective Government schools and students from Independent schools, within the same ENTER band. This pattern was consistent across all ENTER bands examined. These findings imply that attendance at an independent school confers an advantage relative to students' talent (as measured by subsequent university performance). These results replicate much of what has been said in the past, and also indicate something in common with British research on school types, Year 12 scores and university performance.

These results ought to cause some tremors among higher-education policy makers. Bright students from non-selective Government schools are disadvantaged in Year 12. Perhaps there should be a larger number of Government selective schools, which focus on producing young people with the best possible opportunity to get the ENTERs required to get into the hard-to-enter courses, such as law and medicine. Alternatively, perhaps students from non-selective Government schools should receive ENTER compensation when university places are being allocated.

Policies to equalise students' opportunities to gain admission to university have been in place for many years. Most frequently they have sought to increase the numbers of students with 'designated equity characteristics', such as students from non-English-speaking backgrounds or women in non-traditional courses. Statistical analysis shows clearly that students from relatively disadvantaged schools, who gain lower ENTERs in Year 12, subsequently catch up to, and then overtake their more privileged counterparts from other school types once at university. Perhaps a new equity category based on school type should be introduced.

## References

- <sup>1</sup> Department of Education, Science and Training: Calculated from Aggregated Data Set (Enrolments), 2001. Available at [www.dest.gov.au](http://www.dest.gov.au). Accessed 1 March 2005.
- <sup>2</sup> *ibid.*
- <sup>3</sup> See A. Calderon, I. R. Dobson and N. Wentworth, 'Recipe for Success', *Journal of Institutional Research*, vol. 1, no 9, 2000, pp. 111-123.
- <sup>4</sup> See B. Birrell, V. Rapson, I. R. Dobson, D. Edwards and F. T. Smith, *From Place to Place*, Centre for Population and Urban Research, Monash University, Melbourne, 2002.
- <sup>5</sup> M. Evans, and A. Farley, *Institutional characteristics and the relationship between students' first year university and final year secondary school academic performance*, Working Paper, 18, Department of Econometrics and Business Statistics, Monash University, 1998, p. 3
- <sup>6</sup> I. R. Dobson and R. Sharma, 'Student progress: a study of the experience in Victorian tertiary institutions', *Journal of Tertiary Education Administration*, vol. 15, no. 2, 1993, pp. 203-211. The entrance scores cited were Anderson Scores, which scored students according to a formula out of 420.
- <sup>7</sup> Evans and Farley, *op. cit.*, p.1

- <sup>8</sup> K. McKenzie, and R. Schweitzer, 'Who Succeeds at University? Factors predicting academic performance in first year Australian university students', *Higher Education Research and Development*, vol. 20, no. 1, 2001, pp. 21-33.
- <sup>9</sup> M. Murphy, K. Papanicolaou, and R. McDowell, 'Entrance score and performance: A three year study of success', *Journal of Institutional Research*, vol. 10, no. 2, 2001, pp. 32-49
- <sup>10</sup> F. Tomazin, 'ENTER score no success: study', *The Age*, 13 June 2003
- <sup>11</sup> L. West, 'Differential prediction of first year university performance for students from different social backgrounds', *Australian Journal of Education*, vol. 27, 1985, pp. 175-187
- <sup>12</sup> *ibid.*, pp. 183-184
- <sup>13</sup> *ibid.*, p. 186
- <sup>14</sup> M. Evans, and A. Farley, *op. cit.*
- <sup>15</sup> R. Gittins, 'Do private schools give you value for money?', *The Age*, November 24, 2004, p. 19
- <sup>16</sup> *ibid.*
- <sup>17</sup> A. Harrison, 'Higher degrees for state school pupils', *BBC News*, <http://newsvote.bbc.co.uk>, Accessed 22 October, 2004
- <sup>18</sup> Higher Education Funding Council for England (HEFCE), 'Schooling effects on higher education achievement', *HEFCE, Issues Paper*, no. 32, 2003, p. 3
- <sup>19</sup> Harrison, *op. cit.*, p. 2
- <sup>20</sup> Birrell et al., *op. cit.*, 2002, p. 11
- <sup>21</sup> R. Gittins, *op. cit.*
- <sup>22</sup> For example, see Birrell et al, *op. cit.*; Calderon et. al., *op. cit.*, 2000; Dobson and Sharma, *op. cit.*