

7. VARIOUS BIBLIOMETRIC HYPOTHESES:

- *There has been a decline in the proportion of Australia's publications that are very highly cited ('big bangs'), leading to a decline in citation shares;*
- *Australians are finding it harder to publish in the 'top' journals and this is a major contributing factor to the decline in Australia's citation shares; and,*
- *Australians may be publishing fewer review articles, leading to a reduction in citation shares.*

Appendix 2 contains a full report of the analyses conducted to investigate the above hypotheses. A summary of the findings and general conclusions is reported below.

7.1 A decline in highly cited articles?

The hypothesis regarding a decline in the proportion of very highly cited Australian publications was not supported. In data based on a two-year citation period, Australia actually exhibited an increase in the proportion in all but one band (1980-1989) in this top bracket between the beginning and end of the period. A similar trend was exhibited when the citation period was increased to four years.

7.2 A decline in publishing in 'top' journals?

One explanation for the decline in share of citations for Australian science shown in Bourke and Butler (1993) is that there has been a declining presence in the high impact journals. The analyses reported in Appendix 2 does appear to provide a partial explanation. Of six case studies of declining fields that were studied in detail, three suggested the hypothesis could be part of the answer - Chemical Sciences, Physical Sciences and Immunology. For the other three fields - Physiology, Neurosciences and Pharmacology - no decline in high impact journals was noted. Of the two fields that had remained strong in terms of citation shares in Bourke and Butler (1993) - Earth Sciences and Agricultural Sciences - both showed an increasing presence in the high impact journals for their fields.

While the hypothesis regarding high impact journals does appear to provide part of the explanation for Australia's decline in citation shares, the question of cause remains: is there a decline in the quality of Australian science, or are there displacement effects, with more and more researchers competing for an outlet in the 'top' journals?

7.3 A decline in review articles?

Review articles are the most highly cited type of journal publication in the Science Citation Index. Australia's share of this type of publication has increased significantly over the time period 1981-1993, and is at a higher level than that for the average of all publication types. This hypothesis is therefore not supported by the evidence.