Table 5: Fees for MBA and Business degree qualifications in Auckland 2004.

Business Degree*

	Domestic		International	
	per year	**3 years**	**per year**	**3 years**
Massey University	3,279	9,837	14,000	42,000
AUT	4.025	12,075	17,000	51,000
University of Auckland	3,850	11,550	16,440	49,320
UNITEC	na	10,280	14,500	43,500
Manukau Institute of Technology	3,304	9,912	14,000	42,000
AIS St Helens	3,290	9,870	13,475	40,425

* tuition fees only

MBA

|	Domestic	International
Massey University	18,504	30,000
AUT	23,900	31,500
University of Auckland	26,128	na
UNITEC	na	na
Manukau Institute of Technology*	21,000	21,000
AIS St Helens	15,500	24,000

* Southern Cross University qualification

Figure 1: Number of Student Enrolled in New Zealand Tertiary Educat
**Institutions, 1991 to 2002**
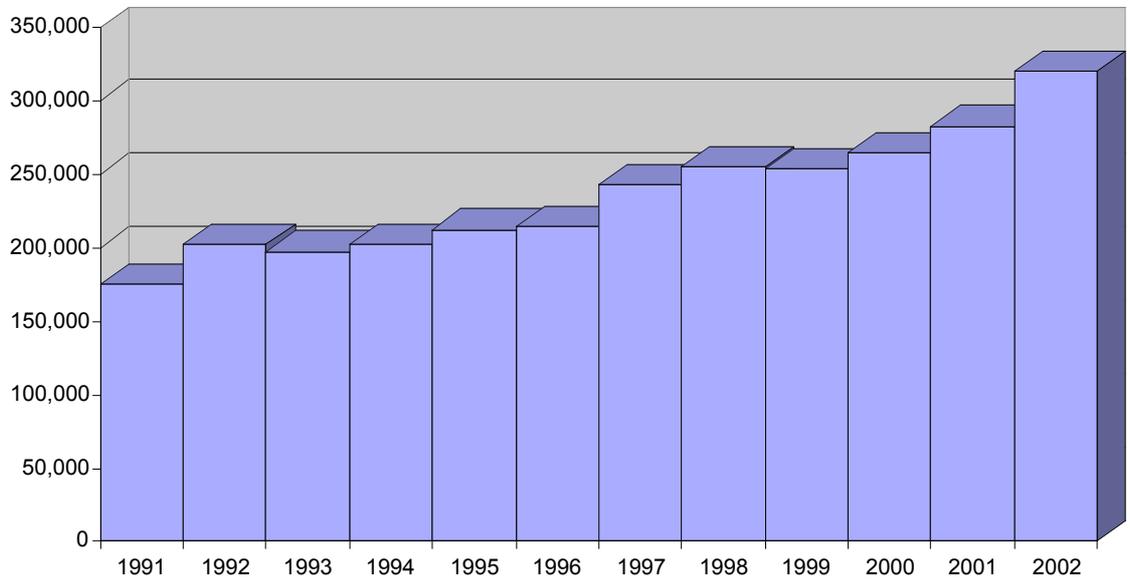
Source: *Education Statistics* .

Figure 2: International Students as a Percentage of Total Students an
Domestic Students as a Percentage of the New Zealand Population
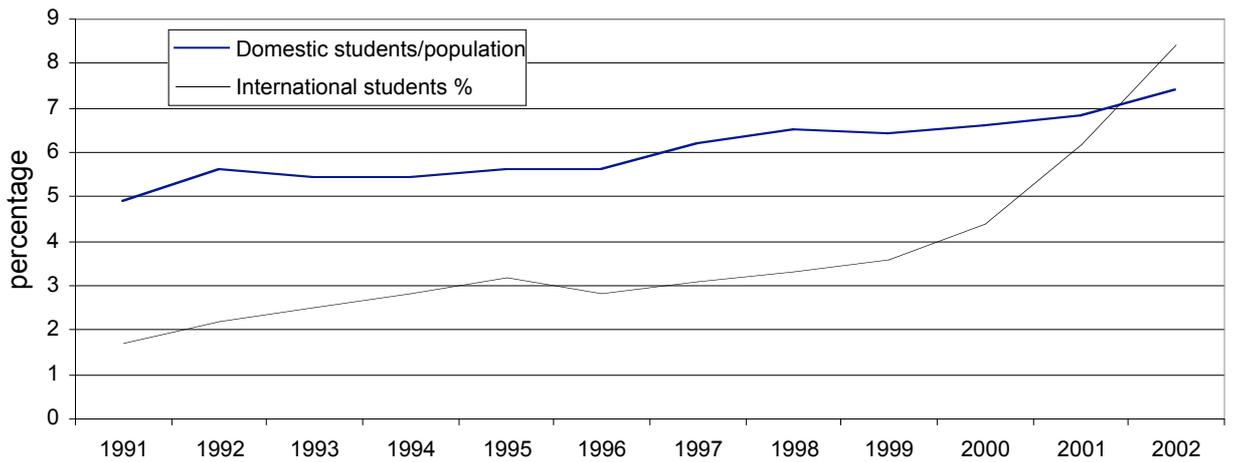
Source: *Education Statistics*

Figure 3: Real Government Funding of of Tertiary Education Institions in N Zealand: 1992 to 2002, ($1999 per EFTS)
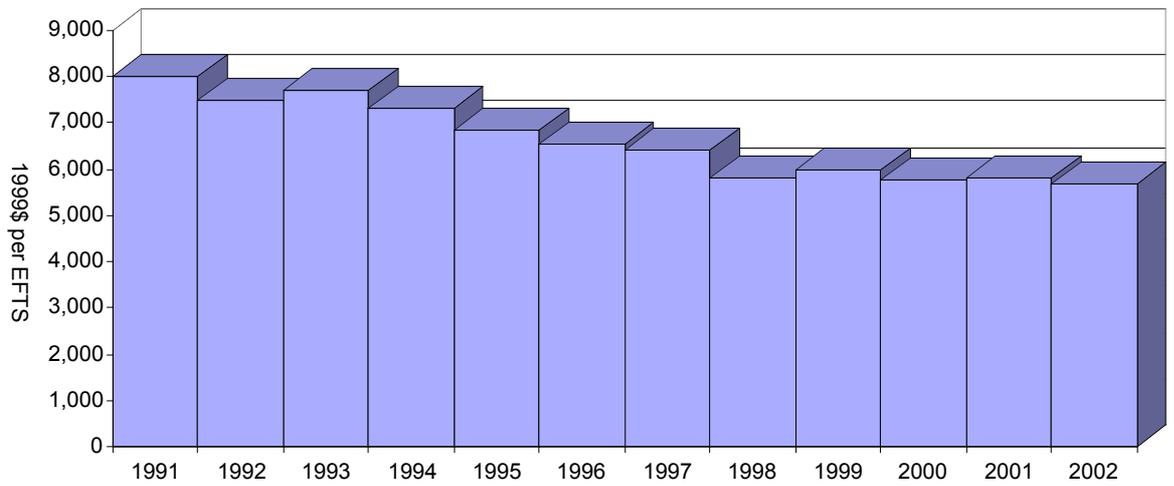
Source: Tertiary Education Commission 2003.

Appendix

Productivity measures

Issue of the level of productivity achieved by organisations is just as important with the tertiary education sector as it is in any sector such as manufacturing or finance. In resources are scare and interested parties wish to see education delivery maximised within these constraints then increasing the level of productivity is one way of achieving this. Productivity can be defined as being the amount of output per unit of inputs achieved by a firm, industry or country. This may be output per unit of a single particular factor of production for example labour (partial productivity) or total productivity can be measured which involves relating all inputs in the production process to the level of output. The productivity of a single input unit can be raised by using more or the other inputs (say for instance more capital per labour), improved technology, improved use of recourses, better management of by achieving greater economics by raising scales of production.

In the tertiary education sector the min relevant outputs and inputs used are the students educated, and in the case of the universities research conducted with the main inputs being the numbers of academic and general staff employed as well as capital (equipment and buildings). Partial productivity measures can be determined by simply dividing the output by a single input; say for instance students divided by staff or students divided by amount of capital used. One way of determining the level of total factor productivity is to use data envelopment analysis to estimate a Malmquist index. The idea behind this approach is to use data collected for the organisations and to derive what is known as the 'best practice frontier'. The Malmquist total factor productivity index is one method of doing so. In effect, the Malmquist index derives an efficiency measure for one year relative to the prior year, while allowing the technical progress frontier to shift. Logically, the frontier may shift outwards and reflect technical progress. Data envelopment analysis was pioneered by Charnes et al (1978) who were in turn influenced by Farell (1957). There are now many texts offering a detailed discussion this approach including the algorithms used (see, for example, Lovell and Schmidt 1988, Fare, Grosskopf and Lovell 1985 and Coelli, Rao and Battese 1998). The software used in this case was that developed by Coelli (1996a). Data Envelopment Analysis has been used to evaluate the productivity and efficiency of a number industry sectors including the tertiary education sector in a wide variety of countries (for just a few examples Athanassopoulos, and Shale 1997; Tomkins and Green 1988; Wilkinson 1993; Johnes and Johnes 1993, Johnes 1995; Coelli 1996b; Hashimoto 1997 and Abbott and Doucouliagos 2000, 2002).

The Data Envelopment Analysis used here draws on three inputs and one output in the case of the polytechnics and three inputs and two outputs in the case of the universities. The one output used in both cases is the number of equivalent fulltime students in each institution. In addition the number of research publications is used as an additional output for the universities. In the case of the capital stock the amount of building space is used for the universities and fixed assets in real terms for the polytechnics as a proxy for capital stock For labour the numbers of academic staff and general staff were used as separate inputs for both the polytechnics and universities.

The data used in this study is derived from a sample, which includes all of the polytechnics between 1995 and 2002 and separately all of the universities between 1994 and 2002. The Open Polytechnic is the only institution not included. The Auckland Institute of Technology/Auckland University of Technology is included in the polytechnic data set for the whole period. Data was derived from the Annual Reports of these institutions.

In common with most of the literature on the efficiency of higher education institutions, the measure of output used in this paper does not control for differences in quality. This is necessitated by lack of data. Moreover, data is available only for each institution as a whole, so that it is not possible, for example, to compare business schools across the different institutions.

The results of both the partial and total productivity measures appear in the table 3 and 4.

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