



Benchmarking the performance of English universities

Jeff Pursglove

Hull City Council, Kingston upon Hull, UK, and

Mike Simpson

Sheffield University Management School, University of Sheffield, Sheffield, UK

Abstract

Purpose – This paper seeks to examine the effectiveness of teaching and widening participation as measures to assess, compare, and benchmark the performance of English universities.

Design/methodology/approach – Uses data from a paired sample English universities to compare the effectiveness of teaching and widening participation in: research-orientated “Russell Group” universities versus teaching-orientated “post 1992” universities. All data were in the public domain and provided from reports of the Higher Education Funding Council for England, The Higher Education Statistics Agency and *The Times Higher Education Supplement*.

Findings – The analysis quantified the greater academic effectiveness and academic efficiencies of post-1992 universities compared with members of the Russell Group. These results are the complete opposite of the widely accepted position of universities in published league tables and so are likely to be controversial.

Research limitations/implications – The equations used for the numerical analysis could be modified to give a different weighting to different factors and/or to include the effectiveness of research activity, and could therefore result in a different interpretation of the data.

Practical implications – The introduction of variable top-up fees in 2006 will probably lead to the Russell Group universities charging a higher monetary price. If all other factors remain unchanged, this will increase the academic and operational efficiencies of the Russell Group universities compared with the post-1992 group.

Originality/value – This is highly original analysis of existing data in the public domain and leads to controversial but logically inescapable findings.

Keywords Performance measures, Universities, Financial performance

Paper type Research paper

Introduction

The UK government’s White Paper *The Future of Higher Education* (DfES, 2003) states that all English universities are expected to excel both in teaching and in widening participation (i.e. in attracting and retaining students from non-traditional backgrounds), together with strengths in one or more of: research; knowledge transfer; linking to the local and regional economy; and providing clear opportunities for students to progress. This means that the effectiveness of teaching and widening participation is a measure which can reasonably be used to assess, compare, and benchmark the performance of all English universities. Other such measures could not

The authors are indebted to Professor J.M. Norman, University of Sheffield for his helpful comments on this work. The authors would also like to thank the staff of the University of Hull library for allowing access to various research materials.



be applied universally, for they would need to take account of the different missions and strategies of individual universities.

Universities not only need to be effective in teaching and in widening participation, they should also be efficient, i.e. to operate in a manner which makes the best use of their resources. We have addressed the issue of efficiency in developing a model of university financial performance (Pursglove and Simpson, 2001). This model yielded a ratio of academic efficiency, amongst others, and was used to show how alliances of universities differed from one another and to map the financial effects of strategy at one university (Sheffield) over five years. The model was improved following feedback (THES, 2001) on the original model, and then used to carry out longitudinal analyses of financial performance for six universities over seven years (Pursglove and Simpson, 2004). This latter work demonstrated the robustness and utility of this measure of academic efficiency.

Literature review

This research originated in an initial study of performance indicators (PIs) for research at UK universities and the application of the balanced scorecard approach (Pursglove and Simpson, 2000). Later work led to a model of university financial performance and to ratios of financial performance that can be used to the benefit of decision-making by managers within universities (Pursglove and Simpson, 2001). That work was widely reported (Goddard, 2001a) and considerable feedback was received (THES, 2001). These ratios of financial performance are distinct from the PIs that are produced by the Higher Education Funding Council for England (the HEFCE), for all publicly-funded universities and colleges in the UK (HEFCE, 2003a). Those latter PIs, provided by the HEFCE since 1999, measure performance in four areas:

- (1) access to higher education – indicating how successful institutions are in recruiting students from under-represented areas and backgrounds;
- (2) non-continuation rates beyond the first year at an institution;
- (3) projected completion rates based on current movement of students between years of study and an efficiency measure based on the average time taken for students to obtain a qualification, taking account of repeat years and non-completion; and
- (4) research outputs expressed as research output per share of research input, weighted by cost centre, specifically the:
 - share of PhDs awarded per share of academic staff costs;
 - share of PhDs awarded per share of funding council QR funding allocation for research (the “R” grant);
 - share of external research grants and contracts obtained per share of academic staff costs; and
 - share of research grants and contracts obtained per share of funding council “R” grant.

A characteristic of these HEFCE PIs is that they are all “lag” indicators. They reflect the outcome of past activities, but they do not state what those activities were, nor do they offer any guidance to universities as to what action should be taken in order to

achieve favourable outcomes. This inherent weakness is compounded by the fact that the PIs are published approximately 18 months after data collection. The HEFCE also produces analyses of universities' operating plans and financial forecasts, which show that 38 per cent of Higher Education Institutions were operating at a deficit in 2001, forecast to fall to 28 per cent by 2004/2005 (Nickols and Lewis, 2001). The HEFCE reports these two sets of PIs in complete isolation from each other. The managers of universities are not made aware of the existence and nature of any linkages or cause and effect relationships between these disparate PIs. We believe that the value of the HEFCE PIs would be dramatically improved by addressing this issue.

The UK government is encouraging diversity amongst universities (DfEE, 2000; DfES, 2003). The universities are also driving diversity themselves, by forming strategic alliances to exploit their differing strengths. This is especially apparent within the Russell Group of universities (so-called because they originally met in the Russell hotel, London). The members of the Russell Group habitually occupy the top places in league-tables of performance (THES, 2004) and receive the majority of the UK's research funding (HESA, 2003). Recent developments with the research assessment exercise (RAE) (Goddard and Tysome, 2001; Thomson, 2001; Goddard, 2001b) have led to further controversy surrounding the performance measurement of universities and the funding of higher education in England (Goddard and Thomson, 2001; Goddard and Wojtas, 2002; Goddard, 2002). There is similar controversy surrounding the teaching quality assessment exercise, which is widely believed to be a paper chasing exercise with little bearing on actual teaching delivery or quality of education received (Tysome, 2002; Baty, 2001, 2002; Sanders, 2002).

Bruneau and Savage (2002) give a coherent and well-argued case against the use of PIs in higher education. Their work gives an account of the chequered history of PIs and their use in education and firmly rejects the neo-conservative claim that PIs are a means of assuring accountability. They show that PIs actually undermine the guiding principles of our public education system where:

... the main point of education is to give people joy in learning, to provide the mental furniture they would need to have interesting lives, to make them into critically-minded inquirers and citizens ... (Bruneau and Savage, 2002, pp. 20-21).

They note that such systems of PIs have stifled creativity, innovation and alternative views of the world. In addition, Bruneau and Savage (2002) point out the massive growth in numbers of administrators and the huge, costly, centralised bureaucracy needed simply to collect and disseminate these PIs. They state that even Margaret Thatcher, a big proponent of public accountability, has been taken aback by this unintended result. Bruneau and Savage (2002) suggest an alternative approach that encompasses openness, practical accountability and quality of teaching and research.

In contrast to the relatively recent measurement of universities' performance, businesses have reported crude financial measures of performance, such as profit and loss, on an annual basis for centuries (Elliot, 1992). The development of more sophisticated measures, reported more frequently and upon which management could act, dates from the beginning of the twentieth century. The "pyramid of financial ratios" developed by the Du Pont company, showed how various factors such as sales revenue and the allocation of fixed costs could be linked to produce a new measure of performance: return on capital employed (Johnson, 1975). Such concepts have been

greatly expanded to meet the needs of managers of manufacturing companies (Harper, 1984) or of financial analysts (Walsh, 1996). However, these numbers are only a reflection of what is actually happening and it is the reality and not the ratios that must be managed (Walsh, 1996). Other authors have also criticised this approach (Johnson and Kaplan, 1987), and have criticised the search for and transfer of best practices in manufacturing (Davies and Kochhar, 2002). Davies and Kochhar (2000) suggest that disappointing results from the implementation of best practices are due to: a failure to link practices to specific measurable objectives; failure to prioritise best practices, and; a lack of analysis of necessary infrastructure practices.

Modern performance measurement techniques have become more sophisticated (Neely *et al.*, 2000) particularly in: manufacturing management (Bourne *et al.*, 2000; De Toni and Tonchia, 2001; Gunasekaran *et al.*, 2001; Medori and Steeple, 2000; McAdam and Bannister, 2001; Ulusoy and Ikiz, 2001); in international manufacturing networks (Colotia *et al.*, 2003), and; in the supply chain (Beamon, 1999). The factors that affect the evolution of performance measurement systems and how they change over time have been investigated (Kennerley and Neely, 2002). Measuring performance in a changing business environment requires that the measurement systems must be relevant and appropriate for the environment and the strategies of the organisation (Kennerley and Neely, 2003; McAdam and Baillie, 2002). Managers' perceptions of the success and failure of performance measurement initiatives were related to: the purpose of the initiative, and; the structure and culture of the organisation (Bourne *et al.*, 2002). Palmer and Parker (2001) suggest that it is time to re-align performance measurement with post-deterministic discoveries, made in the physical sciences, where uncertainty has to be accommodated. They argue that the proliferation of performance measurement systems suggests that more study into the underlying principles that make these systems strategically successful, in a nonlinear world, would be of immense value to management. Neely (1999) asks why it is that performance measurement has become so important now and gives seven basic reasons: the changing nature of work; increasing competition; specific improvement initiatives; national and international awards; changing organisational roles; changing external demands, and; the power of information technology. The latter reason probably has an impact on both the nature of work and the ability to track improvement initiatives.

The service and public sectors are also keen to embrace performance measurement (Fitzgerald *et al.*, 1991), the balanced scorecard (Carmona and Gronland, 2003); benchmarking (Magd and Curry, 2003; Longo and Masella, 2002; Fowler and Campbell, 2001; Simpson and Kondouli, 2000; Simpson *et al.*, 1999); operational competitiveness rating analysis (Parkan, 2002); efficiency measurement (Sarkis and Talluri, 2002), and productive efficiency (Al-Shammari, 1999). Academics are also looking at ways in which small businesses might devise and use performance measurement systems (Hudson *et al.*, 2001).

There is a wealth of literature documenting the growth, over the last two decades, of PIs applied to universities. Bottrill and Borden (1994) identified the use of over 250 PIs. However, few attempts have been made to explore the relevance or value of such PIs as management tools. Varying numbers of these PIs have been categorised by different authors. The Jarratt Report (1985) described them as internal, external or operating PIs. The Committee of Vice-Chancellors and Principals and University Grants Committee (1986) distinguished between input, process and output PIs, while Cullen (1987)

segregated them according to efficiency, effectiveness or economy. However, such analysis has been superficial, with little assessment of the worth of these PIs. Banta and Borden (1994) stated that PIs should be used with reference to future action rather than past performance, yet the types of PIs to which they refer do not identify what action needs to be taken in order to improve future performance. This same criticism can be levelled at the recommendations of Cave *et al.* (1997). After an extensive survey of the literature, they identified six PIs which they felt should be applied to university research. These were:

- (1) number of research students;
- (2) output of research (publications, patents);
- (3) quality or impact indices based upon citations of publication or impact of journal;
- (4) research income from external sponsors;
- (5) peer review (subjective); and
- (6) reputation rankings (subjective).

Such an approach does not really help the management of a university to manage. In common with the HEFCE PIs (HEFCE, 2003a), it does not identify the causes of any deterioration in performance, or help management decide what needs to be done to rectify the situation. What is needed is a new approach for universities.

The Baldrige Award, the Deming Prize and the European Business Excellence Model (EFQM, 1999) provide a number of other PIs that can be used to measure the potential long-term performance of the organisation. Since, the 1970s, French companies have used a system of performance measurement known as the Tableau de Bord (Lebas, 1994) which is often compared to instruments on the dashboard of a motor car or aeroplane. The Tableau de Bord emphasises physical PIs and is designed to assist individual managers. It is, therefore, primarily an operational management tool, with no clear link between its PIs and the company's strategy, or its long-term financial health. An early, but limited, attempt to describe how corporate strategy could be linked to operational PIs was the Performance Pyramid of Lynch and Cross (1991).

Fitzgerald *et al.*'s (1991) determinants and results framework is designed for service industries and it should therefore be of more relevance to universities. This framework predicts that the different aspects of quality of service, flexibility, resource utilisation and innovation will determine the financial results and competitiveness of the organisation. This makes sense but, in our opinion, the types of measures used to track such determinants do not extend far enough back along the process chain and do not make clear links between corporate strategy and operational PIs. Eccles and Pyburn (1992) present a business model that describes how an organisation's strategies could consist of a series of assumptions about cause and effect relationships. The concept of translating corporate strategic objectives into PIs was further developed by Meekings (1995) using a visible indicator tree. Neely *et al.* (2000) provide an excellent review of these approaches to the design of performance measurement systems.

The balanced scorecard (Kaplan and Norton, 1996) was conceived as a management tool (as opposed to a simple measurement tool) to enable an organisation's strategy to be translated into operational terms. It complements financial measures of past performance with measures of the drivers of future performance. The objectives and

measures of the scorecard, derived from an organisation's vision and strategy, view the performance of an organisation from four perspectives: financial, customer, internal business process and learning and growth. The balanced scorecard approach has been applied to the research activities of UK universities (Pursglove and Simpson, 2000), and to the administration that supports them (Pursglove, 2002). The concept of the balanced scorecard has been developed further by its originators, into a framework which they call a strategy map (Kaplan and Norton, 2001). In such a strategy map, each measure of a balanced scorecard becomes embedded in a chain of cause-and-effect logic, which connects the desired outcomes from the strategy with the drivers that will lead to the strategic outcomes.

Work by Stevens (2001) on the economic efficiency of English and Welsh universities points out that most previous studies on university costs assume economic efficiency (i.e. that the university produces on the minimum-cost frontier). However, Stevens' approach accounts for inefficiency in university provision, investigates the influences on inefficiency, and allows for multiple outputs to be produced by higher education institutions. Stevens finds that there is inefficiency in production and that costs have generally risen, but that output has risen more and so efficiency does appear to have increased over the period 1995/1996-1998/1999.

English universities are "charities by decree": they do not need to make a profit to distribute to shareholders. In 1999/2000, 62.8 per cent of their total income came from public sources (HESA, 2001) and, because of this, their financial management is governed by the HEFCE, as set out in a Model Financial Memorandum (HEFCE, 1997). Specifically, that Memorandum states that:

The Institution (university) shall not have an historical cost deficit in two consecutive accounting periods unless there are sufficient discretionary reserves to cover the deficit. A deficit of less than 0.5% of total income, or £500,000, whichever is the lower, will not be taken into account for these purposes.

In essence, this means that universities are merely expected to break-even. Obviously, any sets of financial PIs which are based solely upon bottom line profit or surplus are inappropriate here.

The clear need for a meaningful way of measuring the financial performance of universities was addressed in our previous papers (Pursglove and Simpson, 2001, 2004). That work yielded a model and ratios having a strong operational focus, rather than simply reporting on the year-end statement of income and expenditure and the balance sheet.

Research objectives

Our objectives were to:

- develop a measure of the academic effectiveness of universities, based upon their combined performance in teaching and in widening participation;
- measure and compare the academic effectiveness and academic efficiencies of a sample of Russell Group and post-1992 universities;
- identify best practice and worst practice; and
- discuss the significance of the results, especially in comparison with current league tables of university performance.

Methodology

For our analysis, we chose the paired sample of Russell Group and post-1992 universities shown in Table I. It should be noted that the Russell Group universities (so-called because their vice chancellors regularly meet in the Russell Hotel, London) are regarded as research orientated universities. The post-1992 universities are mainly teaching orientated institutions, such as polytechnics, that were awarded a university charter in 1992. By pairing universities in the same cities, we sought to isolate the effect of geographic location upon universities' performance (such as the size and characteristics of the hinterland of home-based students from which a university could recruit), or the influence of a city's attributes (such as cost of living and nightlife) upon its attractiveness to students.

All data were in the public domain, and were drawn from the following sources:

- Student non-continuation: "Performance indicators in higher education" (HEFCE, 2003a).
- Student participation: "Performance indicators in higher education" (HEFCE, 2002).
- Percentage of first and second class degrees awarded and the entry point scores of undergraduates: *The Times Higher Educational Supplement* (THES, 2004).
- Financial data: *The Resources of Higher Education Institutions, 2000-2001* (HESA, 2002) and "Resources for the academic year 2000-2001" (HEFCE, 2000).

We chose the academic year 1 August 2000-31 July 2001 for our research, because this was the most recent year for which all of the data were freely available.

Academic effectiveness

The academic effectiveness of a university is essentially a measurement of the process by which inputs are converted into outputs. We sought a measure of academic output (in relation to teaching) that would take into account the completion rates and attainment of students, as calculated by equation (1):

$$\text{Academic output} = a \times b \tag{1}$$

where, *a* = the number of young, full-time first degree students who entered each university in 2000-2001, and who were still in higher education a year later, expressed as a percentage of the intake; *b* = the percentage of 1st and upper 2nd class degrees awarded by each university in the academic year 2000-2001.

We then sought a measure of academic input, searching for parameters that had a direct influence upon academic output. Our analysis demonstrated: a positive

Russell Group	Post-1992
Birmingham	Central England
Leeds	Leeds Metropolitan
Liverpool	John Moores
Manchester	Manchester Metropolitan
Newcastle	Northumbria
Nottingham	Nottingham Trent
Sheffield	Sheffield Hallam

Table I.
The sample of universities used for this research

correlation between the A-level entry point requirements of universities and the class of degree awarded (Figure 1); a negative correlation between participation by students from non-traditional backgrounds and continuation rates (Figure 2), and; a negative correlation between entry point requirements and participation (Figure 3). We therefore calculated academic input by equation (2):

$$\text{Academic input} = c(100 - d) \quad (2)$$

where, c , the mean A-level point scores of undergraduates entering each university in 1997-1998 expressed as a per cent of the maximum possible score of 30 (we chose data from 1997 to 1998 because this cohort would be most likely to have graduated in

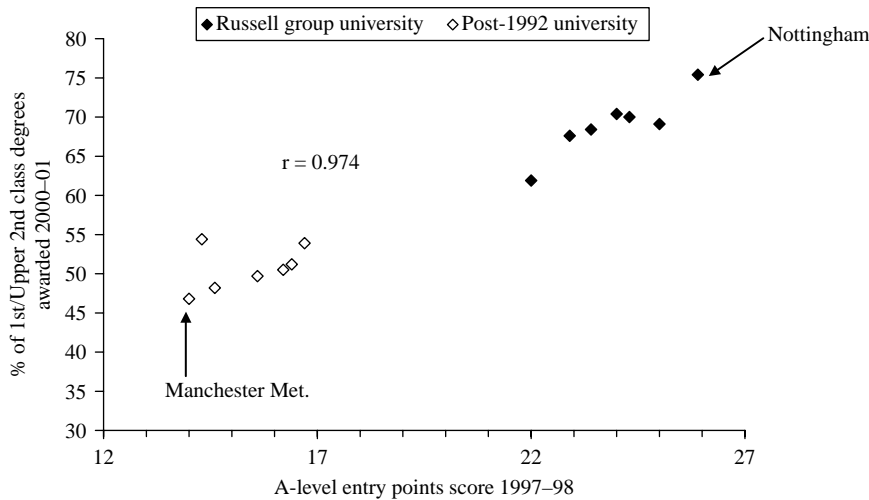


Figure 1.
Effect of entry points on
class of degree

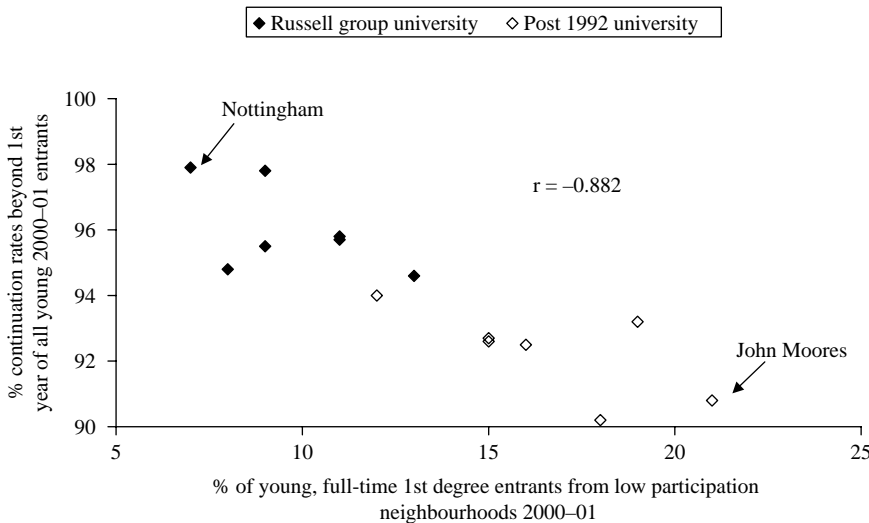


Figure 2.
Effect of widening
participation on student
continuation

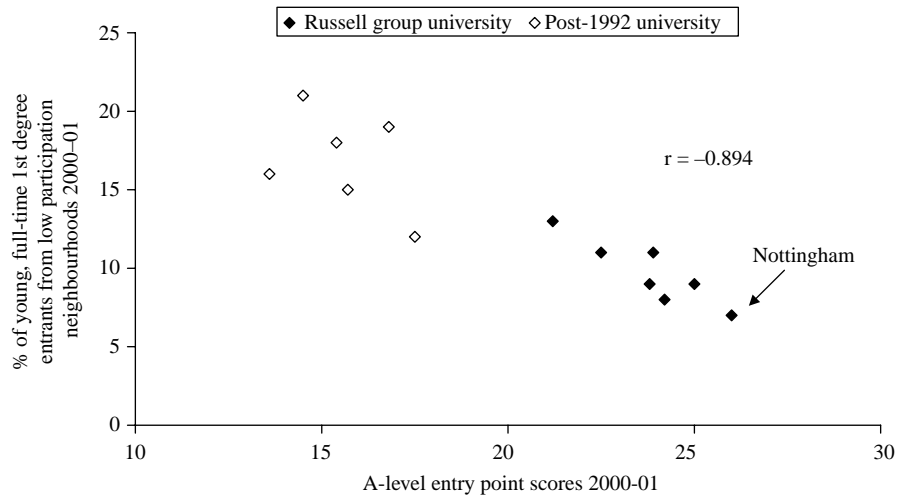


Figure 3.
Effect of entry points on participation

2000-2001 and thus influenced the value of (*b*); *d* = the proportion of young, full-time first degree entrants at each university in 2000-2001 drawn from low participation neighbourhoods (as defined by the HEFCE) expressed as a percentage of the national proportion of such young people (i.e. as a percentage of 0.3).

And so academic effectiveness is expressed as a ratio of output over input and is given by equation (3):

$$\text{Academic effectiveness} = \frac{a \times b}{c(100 - d)} \quad (3)$$

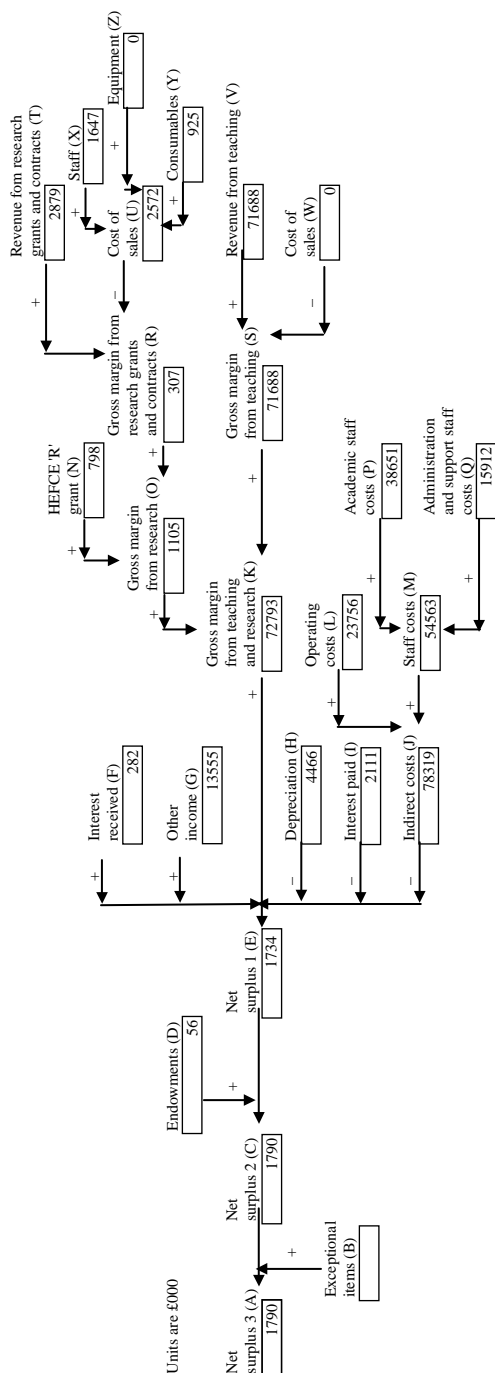
This means that a university would achieve a comparatively high score for academic effectiveness if it had high continuation rates for its students and awarded them a high percentage of 1st and upper 2nd degrees, and yet took in a large proportion of entrants with low A-level scores and from non-traditional backgrounds (i.e. students from poorer families in general and whose parents did not go to university).

Financial performance ratios

Our model of university financial performance is shown in Figure 4, using the University of the West of England as the example. All of the data used to populate the model for each university were either taken from their published financial statements, or from the compendium volume “The Resources of Higher Education Institutions” (HESA, 2002). In this paper we refer to four of the key ratios yielded by the model (the symbols used in the following formulae are shown in Figure 4).

Research intensity. This ratio is the revenue from research as a proportion of the total revenue from teaching and research. It is derived, using the symbols shown in Figure 4, by the formula $(T + N)/(T + N + V)$. A high value indicates that a university is research orientated and a low value means that a university is teaching orientated.

Academic intensity. This ratio is the cost of academic staff as a proportion of total indirect staff costs. It is derived by the formula P/M . This ratio gives an indication of



RATIOS

EFFICIENCY
 Academic Efficiency: $K/P = 1.88$
 Operational Efficiency: $(G+K)/J = 1.103$

DESCRIPTIVE
 Research Intensity: $(T+N)/(T+N+V) = 0.049$
 Academic Intensity: $P/M = 0.708$

Figure 4.
Pyramid of financial ratios
for University of Central
England 2000-2001

the type of organisation in terms of administrative versus academic orientation. An academic orientation would be indicated by a high value for this ratio and an administrative orientation would be indicated by a low value.

Academic efficiency. This ratio describes how much gross margin from teaching and research is made per £ of academic staff costs. It is an indicator of the efficiency of academic staff in producing disposable income for the university. This ratio is derived by the formula K/P .

Operational efficiency. This is the ratio of total income (except for interest and endowments) to indirect costs. It adds a measure of administrative and ancillary efficiency to that of Academic Efficiency and is derived by the formula $(G + K)/J$. By ignoring the factors of interest paid or received, depreciation, endowment income and exceptional items, this ratio vividly describes the surplus or, if the value is less than 1, the deficit that a university makes on its daily operations.

Results and discussion

The key data for each university are shown in Table II.

Relationships between the determinants of academic effectiveness

Figure 1 shows the strong, positive correlation ($r = 0.974$) that exists between the A-level entry point requirements of universities and the class of degree awarded. The Russell Group had the highest entry requirements and awarded a bigger percentage of 1st and upper 2nd class degrees. The two extreme points are Manchester Metropolitan and Nottingham universities.

Figure 2 shows the strong, negative correlation ($r = -0.882$) of participation by students from non-traditional backgrounds and continuation rates beyond the first year of study. The two extreme points are John Moores and Nottingham universities.

From Figure 3 it is seen that, overall, high A-level entry point requirements tend to decrease participation by students from non-traditional neighbourhoods (that is from generally poorer areas where it is unusual for school leavers to enter university) ($r = -0.894$). This trend is especially apparent in the Russell Group, within which, once again, Nottingham represents the extreme case.

These results are in agreement with the findings of Bekhradnia and Thompson (2002), who concluded:

To sum up, entrants with lower A-level points are more likely to drop out, to repeat years and, if they graduate, they are less likely to get a good degree.

Outcomes

It is seen from Table II that John Moores University has the highest academic effectiveness, and that Nottingham University has the lowest. The mean academic effectiveness of the post-1992 universities is considerably greater than that of the Russell Group. Indeed, not one Russell Group university has a score which exceeds that of any member of the post-1992 group. This result is a consequence of the relatively poor performance of post-1992 universities in student continuation and attainment being more than compensated for by their intake of poorly qualified entrants drawn from non-traditional backgrounds.

University	Continuation (a)		Determinants of academic effectiveness			Financial performance ratios			Operational efficiency
	(a)	(a)	Degree class (b)	Entry points (c)	Participation (d)	Academic effectiveness	Research intensity	Academic intensity	
Birmingham	95.5	70.0	81.0	30.0	1.18	0.446	0.695	1.70	1.065
Leeds	94.8	68.4	78.0	26.7	1.13	0.428	0.692	1.70	1.039
Liverpool	94.6	61.9	73.3	43.3	1.41	0.447	0.655	1.78	1.053
Manchester	95.7	70.4	80.0	36.7	1.33	0.433	0.658	1.88	1.038
Newcastle	95.8	67.6	76.3	36.7	1.34	0.468	0.649	1.72	1.004
Nottingham	97.9	75.4	86.3	23.3	1.11	0.437	0.682	1.80	1.038
Sheffield	97.8	69.1	83.3	30.0	1.16	0.461	0.691	1.75	1.072
<i>Russell Group mean</i>	<i>96.0</i>	<i>69.0</i>	<i>79.8</i>	<i>32.4</i>	<i>1.24</i>	<i>0.446</i>	<i>0.675</i>	<i>1.76</i>	<i>1.044</i>
Central England	92.5	54.4	47.7	53.3	2.26	0.049	0.708	1.88	1.103
Leeds	92.7	49.7	52.0	50.0	1.77	0.030	0.681	1.96	1.040
Metropolitan	90.8	48.2	48.7	70.0	3.00	0.069	0.645	2.20	1.044
John Moores Manchester	90.2	46.8	46.7	60.0	2.26	0.077	0.683	2.08	1.089
Met. Northumbria	93.2	51.2	54.7	63.3	2.38	0.060	0.698	1.91	1.077
Nottingham	94.0	53.9	55.7	40.0	1.52	0.061	0.621	2.07	1.065
Trent	92.6	50.5	54.0	50.0	1.73	0.101	0.631	2.09	1.112
Sheffield Hallam	92.3	50.7	51.3	55.2	2.13	0.064	0.667	2.03	1.076
<i>Post-1992 mean</i>									

Table II.
Key data

Effect of location

We sought to isolate the effect of geographic location upon universities' performance by pairing universities in the same cities. We have explored this in relation to academic effectiveness in Figure 5, by plotting the rank of each post-1992 university against the rank of its counterpart, from the same city, in the Russell Group. There is a high degree of correlation between the two ranks ($r = 0.929$). This means that the location of a university has a significant effect upon its academic effectiveness, irrespective of whether it is one of the Russell Group or post-1992 universities. The HEFCE has addressed the issue of location by publishing "location adjusted benchmarks" (HEFCE, 2003a), but such benchmarks do not show or allude to this effect as explicitly as our results show in Figure 5.

Our research does not enable us to be precise regarding the reasons for the effect of location, but it is likely to result from a combination of factors such as: the socio-economic characteristics of a particular city and its environs; its accessibility; and its cost of living.

Academic efficiency

Table II shows that the academic staff of the post-1992 universities are more efficient than their counterparts in the Russell Group in converting their salary costs into disposable revenue. None of the Russell Group universities have an academic efficiency greater than any of the post-1992 universities. John Moores university has the highest individual academic efficiency, whilst Birmingham and Leeds universities have the joint lowest. This low academic efficiency of members of the Russell Group agrees with our earlier findings (Pursglove and Simpson, 2001). We are not suggesting that different academic efficiencies are a reflection of the attributes of the academic staff themselves, but rather that they are a consequence of the business environment, strategy and operations of their employer.

These differences in the mean academic efficiencies of the two groups of universities are also found in their mean operational efficiencies, but with more variation within the

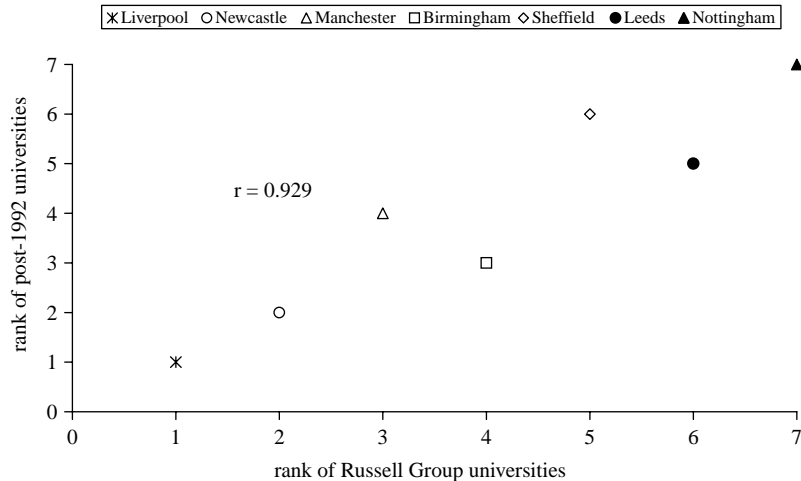


Figure 5.
Rank of academic effectiveness of post-1992 and Russell group universities located in the same cities

two groups. The very low operational efficiency of Newcastle University was identified in our most recent work (Pursglove and Simpson, 2004).

We have identified four possible explanations as to why the post-1992 universities have the higher academic efficiencies:

- (1) Are the academics of Russell Group universities paid more than academic staff in post-1992 universities? If this were so, then there would have to be fewer of them, or else the academic intensity of the Russell Group would be much higher than the post-1992 group, which is not the case (Table II). With that caveat, and considering the dominant research intensities of the Russell Group (Table II), then perhaps research-active staff tend to be paid more than those who are non research-active. Another factor is that there are schools of medicine at all of these Russell Group universities, but none at any of the post-1992 group. Senior clinical staff are amongst the most highly paid, e.g. in 2000-2001, 102 of the 174 higher paid staff at the University of Sheffield were clinicians (Anon, 2001).
- (2) Is research a less lucrative activity than teaching? We have demonstrated that universities follow a cycle of investment in their complement of "high quality" research-active staff prior to each RAE census (Pursglove and Simpson, 2004). Such a census took place in 2001. The resultant increased "R" grant (item *N* in Figure 4) appeared in universities' accounts in 2002-2003, and so would have been undetected by our research for this paper.
- (3) Because we have been unable to access data in the public domain which would have enabled us to account for the direct "cost of sales" in teaching, such as laboratory reagents and similar consumables (represented by item *W* in Figure 4), have we unintentionally favoured the teaching intensive post-1992 universities in our calculation of academic efficiency? If all universities taught the same subjects, in the same proportionate pattern, then this enforced omission of data from our model would indeed favour the academic efficiencies of the teaching intensive post-1992 universities. However, the profile of subjects taught differs between the two groups of universities: specifically, the Russell Group offer medical subjects, which receive more funding from the HEFCE than do the arts and humanities (HEFCE, 2003b). Notwithstanding this, the unaccounted direct cost of teaching would need to be massive if it were to explain differences in academic efficiency. For example, in order for the academic efficiency of John Moores university (2.20) to be reduced to that of Liverpool university (1.78), the direct cost of teaching at John Moores in 2000-2001 would have had to exceed £15 million, even if the direct cost at Liverpool remained unchanged at zero.
- (4) Are the universities of the Russell Group under less pressure to improve their academic efficiency, because their inflow of funds from endowments and investments cushions them from financial hardship? In the financial year 2000-2001, the seven Russell Group universities had a total net inflow of funds from endowments, investments and interest of £13.9 million, compared to a net outflow of £12.6 million at the seven post-1992 universities (HESA, 2002).

The four factors listed above are not mutually exclusive: some or all of them could be working in combination to influence academic efficiency in the two groups of universities.

Matrix comparison

In Figure 6 we have plotted the academic efficiency of each university against its academic effectiveness, and have defined four quadrants by drawing lines at the mean values of the two co-ordinates. The Russell and post-1992 universities are clearly separated. According to Figure 6, apart from the partial outliers of Nottingham Trent and Central England, the post-1992 universities are both academically effective and academically efficient.

The university located firmly in the top right hand corner of the Figure 6 is John Moores: according to our analysis this is the university that demonstrates overall best practice. The Russell Group universities are tightly clustered, and so we think that it would be inappropriate to single out any particular one as being the antithesis of John Moores. Indeed, the close proximity of the Russell Group universities is what one would expect from a cohesive group, whose members have similar attributes, objectives and strategies.

Conclusions and recommendations

We found: a positive correlation between the A-level entry point requirements of universities and the class of degree awarded; a negative correlation between participation by students from non-traditional backgrounds and continuation rates beyond the first year of study, and; a negative correlation between A-level entry point requirements and participation by students from non-traditional neighbourhoods.

Our analysis quantified the greater academic effectiveness and academic efficiencies of post-1992 universities compared to members of the Russell Group. These results are the complete opposite of the widely accepted position of universities in published league tables (THES, 2004) and so are likely to be controversial.

In introducing its latest set of PIs, the HEFCE states that:

When the proposals for performance indicators were put forward, there were concerns that publishing such indicators would encourage people to make comparisons between institutions which were so different from each other that they should not be compared (HEFCE, 2003a).

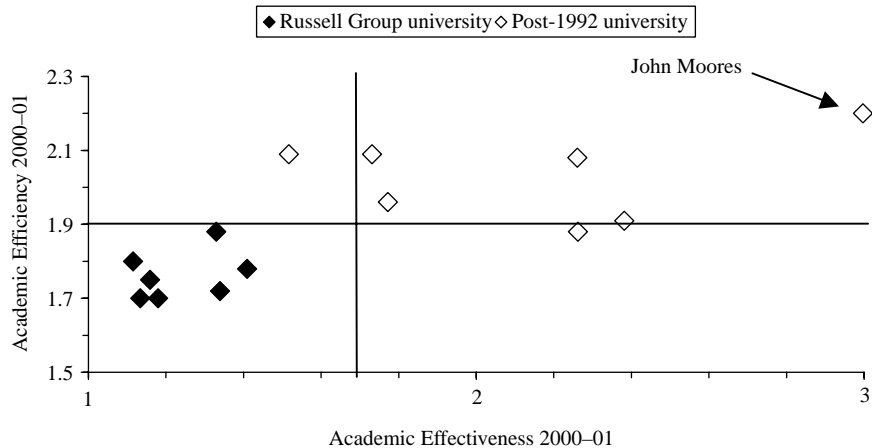


Figure 6.
Academic effectiveness
versus academic efficiency

In contrasting the academic effectiveness of the Russell Group and post-1992 universities, we have made the type of comparison that the HEFCE did not wish to encourage: presumably, the HEFCE would prefer that differences in performance were sought solely within the two groups of universities, rather than between them. Whilst we appreciate the concerns of the HEFCE, nevertheless we believe that our attempt to quantify and explain the differences between the Russell Group and post-1992 universities, in such an open and transparent manner, has yielded fresh insights into their performance (e.g. the effect of location, as shown in Figure 5, which we recommend as a subject which merits further investigation).

In this paper, we have only addressed the academic effectiveness of universities in teaching and in widening participation: our justification being that these are the two areas in which the UK government expects that all universities will excel. However, it may be argued that some of the factors in equation (3) should carry different weightings. For example, if that equation were modified on the basis of academic attainment being twice as important as widening participation, then the ranking of the universities would change somewhat. We recommend that the case for, and the consequences of such different weightings are investigated. We also recommend that the opportunity is taken to bring in other factors, which relate to the distinctive missions and strengths of individual universities in other areas. In particular, equation (3) should be developed to take account of the research activities and outputs of the Russell Group universities.

If the Russell Group universities are to increase their academic and operational efficiencies, they must increase disposable income and/or reduce costs. We have shown that members of the Russell Group are able to charge their student intake a higher “academic price” (i.e. a higher A-level points score) than the post-1992 universities. Because of this, we believe that the introduction of variable top-up fees in 2006 (DfES, 2003) will, in turn, lead to the Russell Group universities charging a higher monetary price. If all other factors remain unchanged, this will increase the academic and operational efficiencies of the Russell Group universities compared to the post-1992 group. We therefore recommend that, sometime after 2006, a study is undertaken to see what effect variable top-up fees have had on the A-level points score and monetary price demanded by universities of their entrants, and upon the academic efficiencies of the universities.

In common with the HEFCE PIs, our measures of academic efficiency and academic effectiveness are “lag” PIs. They reflect the consequences of previous actions, and are further dated by delays in the publication of their constituent data. The focus of our current work is, therefore, to apply the concept of strategy maps (Kaplan and Norton, 2001), to show not only how these PIs can be tailored to measure the achievement of a university’s mission statement, but also to identify the links between them and the daily activities within the university.

References

- Al-Shammari, M. (1999), “A multi-criteria data envelopment analysis model for measuring the productive efficiency of hospitals”, *International Journal of Operations & Production Management*, Vol. 19 Nos 9/10, pp. 879-90.
- Anon (2001), *The University of Sheffield Financial Statements 2000-01*, University of Sheffield, Sheffield.

- Banta, T. and Borden, V. (1994), "Performance indicators for accountability and improvement", *New Directions for Institutional Research*, Vol. 82, pp. 95-106.
- Baty, P. (2001), "Outrage at claims by QAA chief", *The Times Higher Education Supplement*, 31 August, pp. 3, 14-16.
- Baty, P. (2002), "Delay spares QAA a review", *The Times Higher Education Supplement*, 18 January, p. 8.
- Beamon, B.M. (1999), "Measuring supply chain performance", *International Journal of Operations & Production Management*, Vol. 19 Nos 3/4, pp. 275-92.
- Bekhradnia, B. and Thompson, J. (2002), "Who does best at university?", *The Guardian*, 15 October.
- Bottrill, K. and Borden, V. (1994), "Using performance indicators to guide strategic decision-making", *New Directions for Institutional Research*, Vol. 82, pp. 107-19.
- Bourne, M., Mills, J., Wilcox, M., Neely, A. and Platts, K. (2000), "Designing, implementing and updating performance measurement systems", *International Journal of Operations & Production Management*, Vol. 20 No. 7, pp. 754-71.
- Bourne, M., Neely, A., Platts, K. and Mills, J. (2002), "The success and failure of performance measurement initiatives: the perceptions of participating managers", *International Journal of Operations & Production Management*, Vol. 22 No. 11, pp. 1288-310.
- Bruneau, W. and Savage, D.C. (2002), *Counting Out the Scholars: The Case Against Performance Indicators in Higher Education*, James Lorimer & Company, Ltd, Toronto.
- Carmona, S. and Gronland, A. (2003), "Measure vs actions: the balanced scorecard in Swedish law enforcement", *International Journal of Operations & Production Management*, Vol. 23 Nos 11/12, pp. 1475-96.
- Cave, M., Hanney, S., Henkel, M. and Kogan, M. (1997), *The Use of Performance Indicators in Higher Education: The Challenge of the Quality Movement*, Jessica Kingsley, London.
- Colotia, I., Shi, Y. and Gregory, M.J. (2003), "Operation and performance of international manufacturing networks", *International Journal of Operations & Production Management*, Vol. 23 No. 10, pp. 1184-206.
- Committee of Vice-Chancellors and Principals and University Grants Committee (1986), *Performance Indicators in Universities: A First Statement by a Joint CVCP/UGC Working Group*, CVCP, London.
- Cullen, B. (1987), "Performance indicators in UK higher education: progress and prospects", *International Journal of Institutional Management in Higher Education*, Vol. 11, p. 2.
- Davies, A.J. and Kochhar, A.K. (2000), "A framework for the selection of best practices", *International Journal of Operations & Production Management*, Vol. 20 Nos 9/10, pp. 1203-17.
- Davies, A.J. and Kochhar, A.K. (2002), "Manufacturing best practice and performance studies: a critique", *International Journal of Operations & Production Management*, Vol. 22 No. 3, pp. 289-305.
- De Toni, A. and Tonchia, S. (2001), "Performance measurement systems: models, characteristics and measures", *International Journal of Operations & Production Management*, Vol. 21 Nos 1/2, pp. 46-70.
- DfEE (2000), "Radical changes will prepare higher education for the 21st century – Blunkett", available at: www.dfes.gov.uk/news (accessed February).
- DfES (2003), *The Future of Higher Education*, Department for Education and Skills, Stationery Office Ltd, Norwich.

- Eccles, R.G. and Pyburn, P.J. (1992), "Creating a comprehensive system to measure performance", *Management Accounting (US)*, October, pp. 41-4.
- EFQM (1999), available at: www.efqm.org
- Elliot, R.K. (1992), "The third wave breaks on the shores of accounting", *Accounting Horizons*, June, pp. 61-85.
- Fitzgerald, L., Johnston, R., Brignall, S., Silvestro, R. and Voss, C. (1991), *Performance Measurement in Service Businesses*, CIMA, London.
- Fowler, A. and Campbell, D. (2001), "Benchmarking and performance management in clinical pharmacy", *International Journal of Operations & Production Management*, Vol. 21 No. 3, pp. 327-50.
- Goddard, A. (2001a), "Why the smart cash is not so clever", *The Times Higher Education Supplement*, 31 August, pp. 6-7.
- Goddard, A. (2001b), "A high five for British research", *The Times Higher Education Supplement*, 14 December, p. 1.
- Goddard, A. (2002), "Knives are out as Hefce breaks vow", *The Times Higher Education Supplement*, 25 January, p. 1.
- Goddard, A. and Thomson, A. (2001), "Ministers favour RAE elite", *The Times Higher Education Supplement*, 21 and 28 December, p. 1.
- Goddard, A. and Tysome, T. (2001), "Investing in success puts elites in red", *The Times Higher Education Supplement*, 30 November, p. 1.
- Goddard, A. and Wojtas, O. (2002), "Time runs out on RAE options", *The Times Higher Education Supplement*, 18 January, p. 3.
- Gunasekaran, A., Patel, C. and Tirtiroglu, E. (2001), "Performance measures and metrics in a supply chain environment", *International Journal of Operations & Production Management*, Vol. 21 Nos 1/2, pp. 71-87.
- Harper, J. (1984), *Measuring Business Performance*, Gower, Aldershot.
- HEFCE (1997), "Model financial memorandum between the HEFCE and institutions", available at: www.niss.ac.uk/education/hefce/pub97 (accessed July).
- HEFCE (2000), "Resources for academic year 2000-01", available at: www.hefce.ac.uk/Pubs/hefce/2000/ (accessed March).
- HEFCE (2002), "Performance indicators in higher education", www.hefce.ac.uk/Learning/PerfInd/2002/ (accessed December).
- HEFCE (2003a), "Performance indicators in higher education in the UK", www.hefce.ac.uk/Learning/PerfInd/2003/ (accessed December).
- HEFCE (2003b), "How the HEFCE allocates its funds", www.hefce.ac.uk/Pubs/hefce/2003/ (accessed June).
- HESA (2001), *The Resources of Higher Education Institutions, 1999-2000, 2000-2001, 2001-2002*, Higher Education Statistics Agency, Cheltenham.
- HESA (2002), *The Resources of Higher Education Institutions, 1999-2000, 2000-2001, 2001-2002*, Higher Education Statistics Agency, Cheltenham.
- HESA (2003), *The Resources of Higher Education Institutions, 1999-2000, 2000-2001, 2001-2002*, Higher Education Statistics Agency, Cheltenham.
- Hudson, M., Smart, A. and Bourne, M. (2001), "Theory and practice in SME performance measurement systems", *International Journal of Operations & Production Management*, Vol. 21 No. 8, pp. 1096-115.

- Jarratt Report (1985), *Report of the Steering Committee for Efficiency Studies in Universities*, CVCP, London.
- Johnson, H.T. (1975), "Management accounting in early integrated industry – E.I. DuPont de Nemours Powder Company 1903-1912", *Business History Review*, Summer, pp. 184-204.
- Johnson, T.H. and Kaplan, R.S. (1987), *Relevance Lost: The Rise and Fall of Management Accounting*, Harvard Business School Press, Boston, MA.
- Kaplan, R. and Norton, D. (1996), *The Balanced Scorecard-Translating Strategy into Action*, Harvard Business School Press, Boston, MA.
- Kaplan, R.S. and Norton, D.P. (2001), *The Strategy-focused Organisation: How Balanced Scorecard Companies Thrive in the New Business Environment*, Harvard Business School Publishing Corporations, Boston, MA.
- Kennerley, M. and Neely, A. (2002), "A framework of the factors affecting the evolution of performance measurement systems", *International Journal of Operations & Production Management*, Vol. 22 No. 11, pp. 122-1245.
- Kennerley, M. and Neely, A. (2003), "Measuring performance in a changing business environment", *International Journal of Operations & Production Management*, Vol. 23 No. 2, pp. 213-29.
- Lebas, M. (1994), "Managerial accounting in France: overview of past tradition and current practice", *European Accounting Review*, Vol. 3 No. 3, pp. 471-87.
- Longo, M. and Masella, C. (2002), "Organisation of operating theatres: an Italian benchmarking study", *International Journal of Operations & Production Management*, Vol. 22 No. 4, pp. 425-44.
- Lynch, R.L. and Cross, K.F. (1991), *Measure Up: The Essential Guide to Measuring Business Performance*, Mandarin, London.
- McAdam, R. and Baillie, B. (2002), "Business performance measures and alignment impact on strategy: the role of business improvement models", *International Journal of Operations & Production Management*, Vol. 972, p. 996.
- McAdam, R. and Bannister, A. (2001), "Business performance measurement and change management within a TQM framework", *International Journal of Operations & Production Management*, Vol. 21 Nos 1/2, pp. 88-107.
- Magd, H. and Curry, A. (2003), "Benchmarking: achieving best value in public-sector organisations", *Benchmarking: An International Journal*, Vol. 10 No. 3, pp. 261-86.
- Medori, D. and Steeple, D. (2000), "A framework for auditing and enhancing performance measurement systems", *International Journal of Operations & Production Management*, Vol. 20 Nos 5/6, pp. 520-33.
- Meekings, A. (1995), "Unlocking the potential of performance measurement: a practical implementation guide", *Public Money & Management*, Vol. 15 No. 4, pp. 1-8.
- Neely, A. (1999), "The performance measurement revolution: why now and what next?", *International Journal of Operations & Production Management*, Vol. 19 No. 2, pp. 205-28.
- Neely, A., Mills, M., Platts, K., Richards, H., Gregory, M., Bourne, M. and Kennerley, M. (2000), "Performance measurement system design: developing and testing a process-based approach", *International Journal of Operations & Production Management*, Vol. 20 No. 10, pp. 1119-45.
- Nickols, K. and Lewis, I. (2001), *Analysis of Corporate Plans, Outcomes of 2001 Financial Forecasts and Annual Operating Statements*, HEFCE 01/71, December Report, Higher Education Funding Council for England, Bristol.

- Palmer, E. and Parker, D. (2001), "Understanding performance measurement systems using physical science uncertainty principles", *International Journal of Operations & Production Management*, Vol. 21 No. 7, pp. 981-99.
- Parkan, C. (2002), "Business performance measures and alignment impact on strategy: the role of business improvement models", *International Journal of Operations & Production Management*, Vol. 22 Nos 5/6, pp. 693-720.
- Pursglove, J.D. (2002), "A case study in building a balanced scorecard for an internal service provider", paper presented at the Third International Conference on Performance Measurement, World Trade Centre, Boston, MA, 17-19 July.
- Pursglove, J.D. and Simpson, M. (2000), "A balanced scorecard for university research", Performance Measurement Past, Present and Future, paper presented at the Second International Conference on Performance Measurement, University of Cambridge, Cambridge, 19-21 July.
- Pursglove, J.D. and Simpson, M. (2001), "A model of university financial performance", *International Journal of Business Performance Management*, Vol. 3 No. 1, pp. 1-15.
- Pursglove, J.D. and Simpson, M. (2004), "Longitudinal trends in university financial performance", *International Journal of Business Performance Management*, Vol. 6 No. 1, pp. 1-21.
- Sanders, C. (2002), "A gravitation towards the mediocre?", *The Times Higher Education Supplement*, 4 January, pp. 6-7.
- Sarkis, J. and Talluri, S. (2002), "Efficiency measurement of hospitals: issues and extensions", *International Journal of Operations & Production Management*, Vol. 22 No. 3, pp. 306-13.
- Simpson, M. and Kondouli, D. (2000), "A practical approach to benchmarking in three service industries", *Total Quality Management*, Vol. 11 Nos 4/5/6, pp. S623-30.
- Simpson, M., Kondouli, D. and Wai, P.H. (1999), "From benchmarking to business process re-engineering: a case study", *Total Quality Management*, Vol. 10 Nos 4/5, pp. S717-24.
- Stevens, P.A. (2001), "The determinants of economic efficiency in English and Welsh Universities", Discussion Paper Number 185, National Institute of Economic and Social Research, London, September.
- THES (2001), "Letters and opinion", *The Times Higher Education Supplement*, 7 September, p. 15.
- THES (2004), available at: www.thes.co.uk/
- Thomson, A. (2001), "£15 billion needed to hit targets", *The Times Higher Education Supplement*, 30 November, pp. 4-5.
- Tysome, T. (2002), "Worst QAA score for Bradford", *The Times Higher Education Supplement*, 11 January, p. 5.
- Ulusoy, G. and Ikiz, I. (2001), "Benchmarking best manufacturing practices: a study into four sectors of Turkish industry", *International Journal of Operations & Production Management*, Vol. 21 No. 7, pp. 1020-43.
- Walsh, C. (1996), *Key Management Ratios: How to Analyse, Compare and Control the Figures that Drive Company Value*, Pitman, London.

About the authors

Jeff Pursglove worked as an agronomist for ICI fertilisers following a PhD in Crop Nutrition before entering general management with a farmers' co-operative. A career change in 1996 brought him to the staff of the University of Sheffield, where he studied for a part-time MBA, specialising in Performance Management. Jeff was project manager for the University's

BIJ
14,1

RAE2001 submission and has produced Balanced Scorecards both for the University's academic and administrative activities. In 2002 he became the Head of Corporate Quality and Performance Management at Kingston upon Hull City Council. Jeff Pursglove is the corresponding author and can be contacted at: Jeff.Pursglove@hullcc.gov.uk

122

Mike Simpson is a Lecturer in Operations Management and Marketing at the Sheffield University Management School. He has a PhD in Chemistry and has worked in industry for a number of high technology companies during the late 1970s and during the 1980s. In 1995 he gained an MBA with Distinction and has been lecturing, researching and carrying out consultancy work since then. E-mail: M.Simpson@Sheffield.ac.uk

To purchase reprints of this article please e-mail: reprints@emeraldinsight.com
Or visit our web site for further details: www.emeraldinsight.com/reprints

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.