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ASSESSING CAPITAL CHARGING IN THE NATIONAL HEALTH SERVICE

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INTRODUCTION

Capital charging was introduced across the UK National Health Service (NHS) on 1 April, 1991 — though with some minor inter-country variation — as one component of the internal market reforms which established purchaser-provider separation. There has been substantial discussion in the literature about both the rationale for capital charging and about the characteristics of the system which was introduced for the NHS (Mayston, 1989 and 1990; Perrin, 1989; Mellett, 1990; and Heald and Scott, 1995a). Nevertheless, the implementation and effects of capital charging have attracted less attention than might otherwise have been the case if it had been introduced as a free-standing reform because it constituted a relatively complicated set of financial changes. In contrast, the simultaneous changes to NHS structure (e.g. purchaser-provider separation and the incorporation of providers as NHS Trusts) were more visible and more readily comprehensible. It seems likely, however, that capital charging is a durable financial innovation which will survive further NHS reorganisations. Capital charging is one component of the Resource Accounting and Budgeting (RAB) reforms which will be implemented across central government during the period 1988–2002 (Treasury, 1994 and 1995); it is consistently portrayed within Treasury advocacy of RAB as one of the key mechanisms which will enable RAB to generate efficiency gains.

Accordingly, it is appropriate to make an assessment of capital charging as implemented in the NHS, both to inform discussion about necessary modifications and to derive lessons from the NHS experience which might have relevance across UK central government. OECD reports (1993 and 1995a) demonstrate that there is widespread international interest in such mechanisms and that the United Kingdom, though trailing New Zealand in terms of the breadth of accounting reforms, is one of the countries with most practical experience. Moreover, given the international interest in purchaser-provider separation and internal markets in public health care (Mason and

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Morgan, 1995; and OECD, 1995b), it is clear that a working model of capital charging will be required for a properly functioning quasi-market system (Bevan, 1996).

Given the available literature, all that is necessary here in terms of background is to emphasise that capital charging was a response to the widely held view that the management of the NHS estate was seriously defective (Davies, 1983) and that this could be attributed to inappropriately structured incentive and monitoring systems (Perrin, 1978; and Lapsley, 1986). The Resource Allocation Working Party review of resource allocation in England had expressed concern not only about the treatment of capital as a 'free good' but also about the way in which it drove revenue allocations as new hospitals attracted funding for running costs:

> there seems to us to be ample evidence to support the view that capital expenditure has ... been permitted to dominate and sometimes distort patterns of development (Department of Health and Social Security, 1976, p.10).

Despite the efforts of the Treasury and the four territorial health departments to instil good practice in project appraisal, there was continued evidence of misdirected capital expenditure as well as of failure to secure adequate maintenance of existing buildings (National Audit Office, 1988; and Audit Commission, 1991). These long-standing concerns pre-dated the idea of an internal market, though its inception was the occasion on which capital charging was introduced.

There are two characteristics of the NHS capital charging system which should be stressed. First, provider assets are valued on the basis of Depreciated Replacement Cost (DRC) (i.e. the cost of replacing on a like-for-like basis, adjusted for expired life), a process which relies upon periodic (i.e. every 3–5 years) revaluation by a professional valuer supplemented by indexation in other years. Problems may arise with DRC valuation (e.g. like-for-like replacement will often be implausible, leading to an overstatement of asset values) (Heald and Scott, 1995b). Second, purchasers pay the capital charges incurred by providers out of funds made available to them by the relevant health department, which distributes funds on some mixture of *reimbursement* (i.e. the purchaser receives funding exactly equal to the capital charges incurred by the providers with which it actually contracts) and *weighted capitation* (i.e. the purchaser receives funding for capital charges which is independent of the actual capital charges incurred by its providers). Moves to full weighted capitation will be painful for those purchasers whose providers are either excessively endowed with capital or whose capital charges per unit of capital are higher than average.

Capital charging can be analysed in three different ways: firstly, by theorising about capital charges (Mayston, 1989 and 1990; Mellett, 1990; and Heald and Scott, 1995a) in the light of the existing literature on public sector capital accounting and of knowledge about the design characteristics

of NHS capital charges as implemented after *Working for Patients* (Secretaries of State for Health et al., 1989); secondly, by econometric analysis of the pattern of capital charges at hospital level, seeking to identify those hospital characteristics which can be viewed as 'charge drivers' (Heald and Pryce, 1995); and, thirdly, by questionnaires and questionnaire-based interviews with relevant NHS staff. These contrasting approaches are complementary to one another, each providing insights not available from the others and leading to cross-fertilisation. The new evidence reported in this article is primarily drawn from the questionnaire approach, but the questions addressed were informed by results from the other approaches.

This article is structured in the following way. The next section summarises the results of three surveys specifically about capital charging (two in New Zealand and one in England) and a fourth survey about NHS financial management which contained reference to capital charging. The section after that reports and interprets the results of a survey of NHS managers' attitudes to capital charging which was conducted from the University of Aberdeen during 1994. The conclusion focuses on how consistent a picture emerges from these separate inquiries, before making proposals about capital charging policy and about future research on capital charging.

SURVEY EVIDENCE ON CAPITAL CHARGING

In New Zealand, two surveys were conducted across government departments: the first by a Treasury questionnaire in June 1992 (detailed in Price Waterhouse, 1993); and the second through structured interviews by Price Waterhouse (1993) in mid-1993. In England, NHS Estates (1994) conducted a postal questionnaire on the effects of capital charging on the NHS estate in June 1993. Unfortunately, the present authors did not discover the existence of this parallel English study until the publication of the results during their own fieldwork. Finally, a more general survey by Mellett and Marriott (1994 and 1995) examined the financial awareness of NHS managers and touched upon capital charging.

Capital charging was introduced for all government departments in New Zealand on 1 July, 1991. Both 1992 and 1993 surveys found 'the major influence of the capital charge regime was the increased awareness managers now had of the costs of holding assets' (Price Waterhouse, 1993, p.10). However, concern was expressed about:

> ... the failure to resolve/communicate the incentive regime which was understood to be part of the overall process of introducing a capital charge. Departments were concerned that where no third party charging was involved, the capital charge was a 'paper' exercise only in that having calculated the charge, the cost was simply added to the overall appropriation for the department (p.6).

Price Waterhouse's own survey across ten departments concluded:

> There are sufficient examples of the way in which the charge has influenced behaviour to state unequivocally that the concept has been successful and that it is important to continue the regime and where possible improve upon it (p.27).

For example, capital charging had sharpened incentives, as manifested in 'The discipline imposed on departments to more rigorously review opportunities for disposing surplus assets' (p.12). However, there were reservations, echoing those of the earlier Treasury survey, about both incentives and valuations:

> On the whole, departments were not satisfied with the level of communication from Treasury explaining the basis and mechanisms of the capital charge regime ... and that unless steps are taken to ensure the charge had real impact on those departmental activities which are fully Crown funded, then there was a real danger of departments losing interest in the regime or finding it irrelevant (pp. 23–24).
>
> A particular example of the way the capital charge has caused departments to focus more closely on their balance sheets is the way in which it has influenced managers to re-visit or question the value placed on their assets. Departments have obviously not wanted to pay a capital charge on assets which have not been realistically valued (p.11).

There were additional concerns that:

> For a number of managers, there was very little investment in, or control over fixed assets. In administrative departments, fixed assets tended to be simply computers plus a few motor vehicles (p.10).

The conclusion drawn from the Treasury questionnaire was that:

> ... not all departments reported the capital charge down to individual budget manager level, although where this was not currently done, most indicated an intention to introduce such reporting in the foreseeable future (p.4).

However, the follow-up Price Waterhouse survey, one year later, found little advance on this (p.9).

The only previous UK study on capital charging was a postal questionnaire survey undertaken in June 1993 by NHS Estates, directed towards District Health Authority (DHA) General Managers and NHS Trust Chief Executives in England (NHS Estates, 1994). The danger in this survey approach was of some Chief Executives and General Managers passing the questionnaire down to a line manager who was thought to be more closely involved in capital charging and thus there being uncertainty as to who had completed the questionnaire. There was a response rate of 56% from the Chief Executives (165 returned questionnaires out of 295 first- to third-wave Trusts) and it was noted that 'The statistical branch of the Finance and Corporate Information Directorate has advised that 95% of proportions resulting from surveys with this response rate would be within 5% of the survey proportion' (NHS Estates, 1994, Annex 2); this is the reason for reporting the results in confidence intervals. Chief Executives reported that 'between 62% and 72% of providers believed that the acquisition of new assets was influenced [by

capital charging]' and that 'between 42% and 52% of providers believed that the disposal of under-used or low-value assets was influenced'. In addition it was found that 'between 66% and 76% of providers believe that capital charging has gone, or will go, some way towards achieving a more cost-effective and better maintained estate'. They also reported that 'just over half of the respondents thought their software package was poor' (Annex 2).

The response rate for purchasers was 46% (68 responses from 148 DHAs). Responses from the purchasers (DHA General Managers) revealed that 'clear majorities obtain both a breakdown in the service prices quoted by providers and the identification of capital charges in overall prices' (p.4). Regarding estate rationalisation 'between 48% and 68% of purchasers believed that capital charging has gone, or will go, some way towards achieving a cost-effective and better maintained estate' whilst 'between 31% and 51% of purchasers were aware of a reduction in capital charges brought about by changes and rationalisation of providers' estates' (Annex 1).

Finally, the survey found that in England 'the effect of capital charges has been neutralised because weighted capitation has not yet been introduced ... Both [purchasers and providers] seem to agree that when weighted capitation is introduced there will be a more tangible impact on the estate' (NHS Estates, 1994, p.2). Nevertheless, the survey found that 'the capital investment program is changing as a result of the capital charging system'; that 'there is some evidence that providers have made assessments of their minimum estate needs' (p.2); and that 'there are indications of a preference for refurbished rather than new build schemes' (p.2).

Though their work did not explicitly concern capital charging, a survey by Mellett and Marriott (1994 and 1995) on the financial awareness of health service managers made reference to the effects of capital charging. Two publications arising out of this Cardiff study report the results of a questionnaire survey sent to managers 'who received, and were expected to act upon, financial information, such as budget reports' (1995, p.40) (consisting of clinicians, nurses, professional and technical staff, administration staff and ancillary staff) at all hospitals within two DHAs in England. They found 'a positive attitude towards the idea of using depreciation' (1995, p.41) and 'demonstrated that managers appreciate the need to include capital charges' (1994, p.52). The majority (66% from a 51% response rate) of respondents also indicated that capital charges should be taken into account before a new asset was bought. Mellett and Marriott concluded that:

> while there may be general acceptance of the concept of depreciation, knowledge of its detailed application is lacking (1995, p.41).
>
> Staff must be given the appropriate knowledge and skills to enable them to participate fully in the achievement of the organisation's goals, some of which are now financial. This study demonstrates that weaknesses in managers' financial awareness exist and indicates the problems of undertaking fundamental structural reforms, in

which it is desired to involve all staff, without adequately addressing the human element (1994, p.61).

THE ABERDEEN SURVEY

Questionnaire-based interviews were conducted during 1994 at Scottish mainland NHS providers and were designed to collect evidence on the views of NHS managers about capital charges three years after their introduction on 1 April, 1991. Probing the views of managers encounters two well-recognised problems which are confronted by most fieldwork research. First, the date at which questions are asked may condition responses. A survey in year $t+1$ (i.e. one year after implementation) would have been conducted during the troublesome period of attempting to make software systems work. The Aberdeen survey was conducted in year $t+3$, by which time software difficulties had in many cases been overcome but before extensive use was being made of capital charging for management purposes. A future survey in Scotland conducted in year $t+6$ would register the effects of the full implementation of weighted capitation. A study in year $t-2$, immediately after the publication of *Working for Patients*, would of necessity have been addressed to a quite different group of respondents, both because many of the current NHS provider units did not then exist and because many of those interviewed in the present study joined the NHS as a direct consequence of the *Working for Patients*' reforms. Second, the views expressed to researchers by respondents need not necessarily be either 'objectively correct' (e.g. whether efficiency gains have resulted), or reflect their 'true' opinions (respondents may feel that certain responses are desired either by their employing organisations or by the researchers themselves). Naturally, questionnaire responses in year $t+3$ have to be considered alongside other evidence, including follow-up surveys and empirical data on trends in asset disposal and acquisition. Despite such caveats, the views of the managers of NHS provider units as to the perceived incentive properties and likely effects of capital charging constitute an important part of the evidence which can be brought to bear. It was decided that this should be a provider study, with a study of purchasers scheduled for a later part of the research programme; this decision was prompted both by the scale of the exercise involved in the provider study (no satisfactory basis for sampling providers in Scotland could be devised) and by the widely held view on the part of informed commentators that the purchaser role had been slow to develop (Hunter, 1994).

There were several reasons for the decision to adopt a questionnaire plus interview approach rather than use a postal questionnaire: the expectation of a much higher response rate; the difficulty in identifying in advance the persons to be sent questionnaires during a period of intense organisational and staffing change; the opportunities available in an interview situation to

probe the reasons for particular responses and thus establish a higher degree of confidence in the questionnaire instrument; and the opportunity to obtain concrete but anonymised examples. The questionnaire was piloted in one Health Board (HB) area in January and February 1994 and the rest of the fieldwork conducted over the period February to November 1994. Piloting led to a few minor changes of wording to improve clarity. As these points had quickly emerged in the pilot interviews, all 11 pilot responses have been treated as comparable to the rest.

The detailed wording of the principal questions on the Aberdeen questionnaire will be provided later in the article in Tables 1 and 3, and discussed there. The lines of questioning were motivated by discussions in the literature on the rationales for capital charging (e.g. the widespread belief that a smaller, more functionally suitable NHS estate would be more cost effective); by a research interest in the process of implementation and particularly in how efficiently that had been managed (discontent was known to have been widespread in the early stages); and by a related interest in probing the extent to which a financial mechanism designed to inject a more business-like culture into the NHS was believed by respondents to be both legitimate and successful (prompting questions about the impact on efficiency and fairness).

The 46 Scottish mainland providers which were surveyed consisted of: 2 first-wave Trusts; 15 second-wave Trusts; 22 third-wave Trusts; and 7 remaining Directly Managed United (DMUs). Excluded from the survey were two other DMUs, one in the process of being merged with an existing Trust and the other in the process of being cannibalised. Given that the implementation of capital charging was known to have encountered difficulties, the Aberdeen project identified those groups which were expected to be most knowledgeable about capital charging. At that juncture — just under three years after initial implementation — it was decided not to direct the questions at chief executives/unit general managers, but to approach those functional specialists who were most closely involved. The advantage of close involvement was judged to outweigh any argument ('accountants would naturally be in favour of more accounting') that functional specialists would be particularly well disposed to changes which emphasised their own importance.

At each provider, the targeted respondents were: (1) the Director of Finance; (2) the person managerially responsible to the Director of Finance for capital charging; (3) the person who actually ran the capital charging software; and (4) the person who was directly responsible to the Chief Executive for the estate. In practice, responsibility for the tasks in (2) and (3) was sometimes combined, and some agency arrangements with HBs for running capital charges had been maintained, so that the person using the software was an HB employee whose duties covered more than one provider. In some providers, capital charging was divided between an accountant with

Table 1

Responses to Main Questions: All Respondents

	Likert Score 1 *Strongly Agree* %	2 *Generally Agree* %	3 *Neither Agree nor Disagree* %	4 *Generally Disagree* %	5 *Strongly Disagree* %	*Mean of Likert Score*	*Standard Deviation of Likert Score*	*Question Response Rate* %
Overall Assessment								
Q.1 'The implementation of capital charges has been a worthwhile financial innovation'	15	68	8	8	1	2.11	0.79	96
Q.2 'Capital charges lead to increased efficiency'	7	56	28	6	3	2.41	0.83	94
Q.3 'Capital charges lead to reduced efficiency'	0	1	34	50	15	3.78	0.71	94
Q.4 'Overall the capital charges system is fair'	2	50	36	12	2	2.62	0.77	91
Accounting and Valuation								
Q.5 'The valuation rules for capital charges are fair'	2	50	23	21	3	2.74	0.93	85
Q.6 'The District Valuer's interpretations of the valuation rules are fair'	0	53	36	10	1	2.59	0.71	82
Q.7 'The capital charges system should have been implemented on the basis of historic cost valuations rather than current cost valuations'	4	18	29	33	15	3.37	1.07	89

Implementation								
Q.8 'Sufficient policy support from the Scottish Office has been available, in the form of manuals, circulars, telephone helplines, and replies to correspondence etc.'	0	34	20	33	13	3.26	1.07	79
Q.9 'Sufficient technical support from the software supplier has been available, in the form of manuals, circulars, telephone helplines, and replies to correspondence etc.'	6	38	24	22	11	2.92	1.13	65
Q.10 'The capital charges software you use now is satisfactory'	11	45	18	16	10	2.69	1.17	76
Funding								
Q.11 'Purchasing allocations to Health Boards should have their (implicit) capital charges component calculated on a weighted capitation basis, taking no account of inter-Board differences in actual capital charges'	12	30	16	33	9	2.97	1.22	77

managerial responsibility and a more junior employee who actually runs the software. Consequently, the results of the survey are reported for (2) and (3) under the rather heterogeneous grouping 'Other Accountants', a category consisting of quite senior qualified accountants and junior accounting technicians. Regarding (4), the pilot had revealed that the way in which the management structures of the newly emerging providers were being configured meant that managers directly responsible for estates usually did not have director status. In consequence, (4) translated according to circumstances into Director of Estates, Director of Operations, Director of Facilities and (at a lower managerial level) Estates Manager.

With 147 identified possible respondents there is an average of 3.2 potential respondents for each provider. There were 142 usable responses; 4 unusable responses; and 1 interviewee who was not available for interview. The composition of respondents was: 45 Directors of Finance, 57 Other Accountants and 40 Directors of Estates/Operations. (The terminology adopted in this article follows practice in Trusts, even though in some DMUs the job titles had remained Unit General Manager, Unit Finance Officer and Unit Estates Officer.) The response rate was 99%. The questionnaire having been posted direct to each respondent one week before the scheduled interview, almost all respondents completed it before the interview as requested; the others were persuaded to do so before a delayed start. Assurances of anonymity having been given, 98% of the usable interviews were tape-recorded.

The results of the statistical strategy explained in the Appendix showed that all the responses to the Likert scale questions could be analysed together rather than separately by job category. Table 1 summarises the responses of all respondents to those questions seeking assessments on a 1–5 Likert scale. On all questions, 1 is labelled 'strongly agree'; 2, 'generally agree'; 3, 'neither agree nor disagree'; 4, 'generally disagree'; and 5, 'strongly disagree'. Table 1 also provides means and standard deviations of the Likert scores, and response rates. A distinction has been made between those who were unable to answer the questionnaire as a whole and those who did not answer particular questions. There were four respondents excluded from the results, all Directors of Estates/Operations, who felt they did not have enough knowledge to answer the questionnaire. Many of the non-responses to individual questions on usable questionnaires were also attributable to Directors of Estates/Operations.

For expository convenience, the questions have been renumbered and regrouped as: overall assessment; accounting and valuation; implementation; and funding. The 'overall assessment' section of Table 1 shows strong support for capital charging: 83% generally or strongly agreed that capital charges are a worthwhile financial innovation; 63% generally or strongly agreed that capital charges lead to increased efficiency; and 52% generally or strongly agreed that the capital charges system is fair. The level of dissent from these

views was very low: 9%, 9% and 14% respectively. The mean for being a worthwhile financial innovation was 2.11; for increased efficiency, 2.41; and for fairness, 2.62. It is noticeable that the responses, though still clearly affirmative, were less so about increased efficiency than about worthwhileness as a financial innovation, and less so about fairness than about increased efficiency. There was emphatic opposition to the proposition that capital charges lead to reduced efficiency: only 1% generally or strongly agreed, and the mean was 3.78.

The 'accounting and valuation' results probe beneath these overall judgements, showing that 52% generally or strongly agreed that the valuation rules are fair, though here 24% generally or strongly disagreed (mean 2.74). There are few complaints about how the District Valuers have interpreted the valuation rules: 53% generally or strongly agreed that this was fair, with only 11% generally or strongly disagreeing (mean 2.59). On the question as to whether Historic Cost (HC) ought to have been used instead of Current Cost, 22% generally or strongly agreed whilst 48% generally or strongly disagreed (mean 3.37).

Evidence was found that there had been serious implementation difficulties: only 34% generally or strongly agreed that Scottish Office policy support had been sufficient, as against 46% who generally or strongly disagreed (mean 3.26). Question 8 is the only question listed in Table 1 for which the null hypothesis (no difference between job categories) was rejected. Further analysis revealed that Other Accountants (25% to 59%, with a mean of 3.51) took a decidedly critical stance, in marked contrast to Directors of Finance (45% to 30%, with a mean of 2.89). On the question of whether technical support had been satisfactory, 44% generally or strongly agreed and 33% generally or strongly disagreed (mean 2.92). On the question of whether software was now satisfactory, 56% generally or strongly agreed whilst 26% generally or strongly disagreed (mean 2.69). It should be noted, however, that respondents to the last two questions (Qs. 9 and 10) were speaking about a range of systems, several having changed or seriously contemplated changing systems. Albeit critical of available policy and technical support, the Aberdeen respondents were noticeably less critical than those in the earlier NHS Estates survey, possibly because of the extra time which had been available in Scotland to resolve software problems.

The question on funding (Q.11) produced a divided set of responses: 42% generally or strongly agreed with full weighted capitation, and 42% generally or strongly disagreed (mean 2.97). Other than taking note of the sharp cleavage, comment on this result is most conveniently postponed until after the effect of 'parent' HB on responses has been considered.

The NHS providers in the survey are geographically located within the area of a particular HB, out of whose control they had recently or would soon opt, but which would remain overwhelmingly dominant as purchaser. Prompted by information gathered from the fieldwork interviews, the statistical tests

were repeated for differences between HB areas. Using the Kruskal-Wallis test, the null hypothesis (no difference between HB areas) was rejected for six (1, 5, 6, 9, 10 and 11) of the 11 questions. The presentation of Table 2 has been affected by the confidentiality guarantees which were given to respondents. Each of the 12 mainland HB areas have been randomly allocated identifying letters (A–L). Means and standard deviations of the Likert scores are reported in Table 2, but numbers of respondents cannot be reported because that might identify some respondents. Part A of Table 2 reports values for those questions for which the null hypothesis was rejected whilst Part B of Table 2 shows values for those questions for which the null hypothesis could not be rejected. When the mean of a Likert score is 3.00 or above, that group of respondents has not endorsed the statement embodied in a particular question.

It is worth paying particular attention to those questions for which the null hypothesis for HB areas was rejected, drawing upon the fieldwork interviews for insights as to why such rejections may have occurred. On Question 1 ('worthwhile financial innovation'), the overall mean was 2.11 and the highest mean Likert score for providers within an HB area (K) was 2.94.

Table 2

Responses Analysed by Health Board (Means and Standard Deviations)

HB	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*	*K*	*L*	*Overall*
Part A: Questions for which null hypothesis was rejected													
Q.1	2.13	1.91	1.80	2.00	2.18	1.71	1.80	2.25	2.29	1.89	2.94	2.00	2.11
	(0.72)	(0.43)	(0.92)	(0.52)	(1.08)	(0.49)	(0.45)	(1.16)	(0.76)	(0.60)	(0.97)	(0.00)	(0.79)
Q.5	2.42	2.65	2.40	3.00	2.64	2.71	2.60	2.17	3.00	3.38	3.25	2.17	2.74
	(0.51)	(1.09)	(0.84)	(0.88)	(0.81)	(0.95)	(1.34)	(0.41)	(0.89)	(0.92)	(1.00)	(0.41)	(0.93)
Q.6	2.43	2.70	3.11	2.64	2.08	2.43	2.60	2.50	2.33	2.33	3.17	2.40	2.59
	(0.51)	(0.92)	(0.60)	(0.74)	(0.29)	(0.59)	(0.55)	(2.33)	(0.52)	(0.52)	(0.83)	(0.55)	(0.71)
Q.9	2.27	2.71	2.43	4.50	1.83	2.33	2.67	2.67	3.17	3.00	3.00	3.50	2.92
	(0.79)	(0.61)	(1.13)	(0.52)	(0.41)	(0.52)	(0.58)	(0.82)	(1.33)	(1.41)	(1.25)	(0.71)	(1.13)
Q.10	2.00	2.88	2.44	4.00	1.67	1.71	2.00	2.33	3.00	3.13	3.00	3.00	2.69
	(0.60)	(1.02)	(1.01)	(0.91)	(0.50)	(0.76)	(0.00)	(1.03)	(1.26)	(1.55)	(1.29)	(0.71)	(1.17)
Q.11	2.90	3.88	2.22	3.07	2.50	2.50	2.20	2.75	4.00	2.14	3.14	3.00	2.97
	(1.20)	(0.99)	(0.97)	(1.49)	(1.27)	(1.00)	(1.10)	(1.16)	(0.63)	(1.07)	(0.86)	(1.26)	(1.22)
Part B: Questions for which null hypothesis could not be rejected													
Q.2	2.53	2.36	2.09	2.27	2.36	2.50	2.00	2.50	2.57	2.30	2.76	2.50	2.41
	(0.92)	(0.95)	(0.94)	(0.70)	(0.92)	(0.55)	(0.00)	(0.76)	(0.79)	(0.48)	(1.03)	(0.76)	(0.83)
Q.3	3.73	3.91	3.82	3.67	4.00	3.50	4.25	3.63	3.86	3.90	3.53	3.88	3.78
	(0.80)	(0.68)	(0.98)	(0.62)	(0.77)	(0.55)	(0.50)	(0.92)	(0.69)	(0.57)	(0.72)	(0.35)	(0.71)
Q.4	2.43	2.45	2.33	2.93	2.45	2.43	2.60	2.50	2.83	3.00	2.94	2.38	2.62
	(0.65)	(0.60)	(0.50)	(0.88)	(0.52)	(0.53)	(1.34)	(1.31)	(0.75)	(0.87)	(0.75)	(0.52)	(0.77)
Q.7	3.53	3.32	3.78	3.00	3.50	2.83	4.00	3.63	3.00	4.00	3.00	3.57	3.37
	(0.74)	(1.16)	(1.20)	(1.00)	(1.17)	(0.98)	(0.71)	(0.74)	(1.10)	(0.76)	(1.41)	(0.98)	(1.07)
Q.8	3.00	3.39	3.22	3.00	2.89	3.60	3.60	2.83	3.20	3.75	3.53	3.17	3.26
	(1.35)	(0.98)	(1.30)	(0.71)	(0.93)	(1.52)	(1.14)	(0.75)	(1.30)	(1.04)	(1.13)	(0.98)	(1.07)

Questions 5 ('fair valuation rules') and 6 ('fair District Valuer') are usefully discussed together. With the overall mean of 2.74 for Question 5, four HB areas (D, I, J and K) each had a mean of 3.00 or above. Compared with an overall mean of 2.59 for Question 6, two HB areas (C and K) each had a mean of 3.00 or above. There is obviously evidence of dissatisfaction at K where overall support for capital charging was lukewarm (Q.1) and where mean responses to the valuation questions (Q.5 and Q.6) fell in the 'disagreement' range of the Likert scale.

Questions 9 ('technical support is satisfactory') and 10 ('software is now satisfactory') are also usefully discussed together. With an overall mean of 2.92 for Question 9, five HB areas (D, I, J, K and L) each had a mean of 3.00 or above. With an overall mean of 2.69 for Question 10, the same five HB areas each had a mean of 3.00 or above. The process of implementation was effected much less smoothly in some HB areas than in others, and this appears to have affected overall attitudes to capital charging. Indeed, there is evidence of differential competence in implementing capital charges and in devolving this responsibility to providers. Providers had differing experiences on software depending upon which software they used, how they acquired it and what technical support was available to them. Curiously, the interviews revealed that, for almost every type of software, there was a provider which was perfectly happy with it and another which could not operate it satisfactorily and was therefore preparing to switch. An important factor was where the provider had obtained the software from: for example, one innovative HB had developed its own software package, encouraged others to adopt it, provided training for external users, and set up a users' group. In contrast, another HB which had bought a software package and then devolved it without support had imposed severe problems on its providers: 'We inherited software from [D] which isn't particularly clever ... It's inflexible, it doesn't allow us to do the sort of detailed analysis reports that we'd like to' (Director of Finance, Acute provider).

It is on Question 11 ('full weighted capitation') where the most marked differences between HB areas are shown in Table 2, following the almost even division revealed in Table 1. The results reveal some polarisation: five HB areas (B, D, I, K and L) have mean scores of 3.00 or above, whilst five (C, E, F, G and J) have mean scores between 2.00 and 2.50. However, the fieldwork interviews revealed that there existed some confusion about gainers and losers from funding changes. In particular, there was sometimes a failure to distinguish between the effects of (i) the substitution of weighted capitation for reimbursement as the basis of distribution for capital charges funding to purchasers; and (ii) modification — stemming from both formulae changes and relative changes in population-based variables — to the distribution of non-capital-charge revenue funding. The responses appeared to reflect a mix of (a) principled views about the respective merits of reimbursement and weighted capitation, and (b) opportunistic responses in the light of

perceptions of the implications of such choices for the respondent's own provider. Thus far, there appears to have been much balancing at purchaser level of high and low capital charge providers, in ways which have limited the impact on providers of the move from full reimbursement to weighted capitation. Weighted capitation affects the financial position of the purchaser, with the result that a provider with 'excessive' capital charges in the area of a gaining HB may not be too concerned. Scotland has been moving decisively towards full weighted capitation as the mechanism for distributing money with which purchasers pay for capital charges whereas in England differences in actual capital charges are still fully neutralised at purchaser level. In part, this reflects conscious policy choice, though one obviously constraining factor in England is that of the high valuations of London hospitals.

Table 3 analyses responses to questions on the effects of capital charges, separately by job category because the null hypothesis is rejected for almost all questions (see the Appendix). In addition to the 'standard' answers which were offered, some respondents availed themselves of the opportunity to write in 'non-standard' answers. Taken together, the responses to Questions 12 and 13 indicate a strong presumption that there will be a smaller NHS capital stock. In all three job categories, a clear majority of those respondents who believed that capital charges affected the *level* of investment considered that the provider would be 'less likely to invest' rather than 'more likely to invest'. Regarding asset disposal, a clear majority of those respondents who believed that capital charges affected the *level* of asset disposal considered that the provider was 'more likely to dispose' than 'less likely to dispose'. On Question 14 (whether *types* of investment would change), the results were mixed: Directors of Finance recorded 38% affirmative to 51% negative, in contrast to Directors of Estates/Operations who recorded 50% affirmative to 30% negative. On Questions 15 and 16, excluding 'don't knows' and non-standard answers, majorities in each case believed that capital charging had not affected the *timing* of investment or disposal decisions. Naturally, there can be a significant effect on aggregates if a substantial minority respond by way of retiming investment or disposals; such timing effects could be either in-year or between years.

Given the role which concern about the condition of the NHS estate had played in the development of the idea of capital charging, fewer respondents than expected saw capital charges as relevant to maintenance decisions (Question 17). Whereas 20% (Directors of Finance) and 18% (Directors of Estates/Operations) considered that capital charging would lead to *different priorities* in maintenance expenditure, only 11% and 8% thought the *level* of maintenance expenditure would change. Unfortunately, a problem with the wording of this question was not detected at the piloting stage. Some of the standard responses are mutually exclusive, whilst others are not. Several respondents did not recognise this and the researchers failed to clarify responses at the interviews: for example, 11% of Directors of Finance expected

Table 3

The Effects of Capital Charges

	Directors of Finance (45) %	*Other Accountants (57)* %	*Directors of Estates/ Operations (40)* %
Q.12 'How has the introduction of capital charges altered the approach to investment in new facilities?'			
— more likely to invest	0	2	3
— less likely to invest	56	19	50
— no effect	33	30	33
— don't know	4	42	8
non-standard answers:			
'more likely to invest' and 'less likely to invest'	0	2	0
'taken into account'	4	4	3
'varies'	2	0	0
'encourages to consider more carefully'	0	0	3
'must be considered'	0	2	0
did not answer	0	0	3
	100	100	100
Q.13 'How has the introduction of capital charges altered the approach to asset disposal decisions?'			
— more likely to dispose	53	28	73
— less likely to dispose	13	9	5
— no effect	27	32	8
— don't know	4	30	13
non-standard answers:			
'taken into account'	0	2	3
'not applicable'	2	0	0
did not answer	0	0	0
	100	100	100
Q.14 'Have capital charges altered the types of investment which will be undertaken?'			
— yes	38	26	50
— no	51	33	30
— don't know	7	40	20
non-standard answers:			
'taken into account'	2	0	0
did not answer	2	0	0
	100	100	100

Table 3 (continued)

	Directors of Finance (45) %	*Other Accountants (57)* %	*Directors of Estates/ Operations (40)* %
Q.15 'Have capital charges affected the timing of investment decisions?'			
— yes	27	18	25
— no	69	44	45
— don't know	4	37	30
non-standard answers:			
'yes and no'	0	2	0
did not answer	0	0	0
	100	100	100
Q.16 'Have capital charges affected the timing of asset disposal decisions?'			
— yes	36	28	30
— no	58	39	35
— don't know	7	33	35
did not answer	0	0	0
	100	100	100
Q.17 'How do capital charges affect decisions on maintenance?'			
— lead to higher maintenance expenditure	7	0	5
— lead to lower maintenance expenditure	4	2	3
— make no difference to the level of maintenance expenditure	24	16	20
— lead to different priorities in maintenance expenditure	20	11	18
— no effect	22	19	28
— don't know	18	51	5
non-standard answers			
'higher and lower'	0	0	8
'taken into account'	2	0	0
'lower and different priorities'	0	2	3
'higher, lower and different priorities'	0	0	3
'makes no difference to level and different priorities'	0	0	5
'higher and different priorities'	0	0	3
'higher, lower and makes no difference to level'	0	0	3
did not answer	2	0	0
	100	100	100

maintenance to be higher or lower; 24% expected no effect on level; 18% indicated 'don't know'; and 2% gave no answer — totalling 55% of respondents rather than 100%. Despite this defect in question administration, the disconnection between capital charges and maintenance stands out as one of the most surprising results of the survey.

In summary, the Aberdeen survey of NHS providers in Scotland demonstrated widespread acceptance of the principle of capital charging, as is shown in the strongly positive response to the 'worthwhile financial innovation' question. Whilst respondents could not generally quantify the costs of implementation, a large majority of respondents considered that efficiency gains would result. Supplementary questioning revealed that respondents usually interpreted this question prospectively, and were thus not necessarily claiming that substantial efficiency gains had already been reaped. The lack of involvement in capital charging on the part of some Directors of Estates/Operations led to a considerable number of non-responses; this was the case even with questions which were of a managerial rather than an accounting nature. The interviews revealed that capital charging was generally viewed as a finance-driven rather than a management-driven exercise, predominantly geared to financial reporting needs (i.e. Trust application documents and annual accounts) and to the making of returns to the NHS Management Executive in Scotland. In relatively few cases was capital charging yet recognised as integral to decision-making; the Estates function, now often part of an Operations command, had been noticeably marginalised in many providers.

CONCLUSION

Although the different wording of questions and survey populations of the Aberdeen, Cardiff and NHS Estates studies rule out direct comparability, the conclusions drawn by the respective researchers are broadly similar and mutually consistent. Opposition to capital charging is shown to be subdued and there is widespread support for the objectives which capital charging was intended to promote. Similarly, it is clear that the substantive effects of capital charging — as opposed to the injection of a more business-like culture into asset management — will only materialise over a considerable period in the future.

Assessments of NHS capital charging must be expressed cautiously because the system was only implemented on 1 April, 1991, and there are good reasons to expect that the effects will occur over the medium term. Moreover, it is impossible to isolate cleanly the effects of the implementation of capital charges when this has been just one of many changes. If capital facilities can be shown — or are thought — to be used more efficiently, is this a consequence of the capital charging system or of the internal market which was introduced simultaneously? The internal market is clearly in its infancy, as evidenced by a limited development to date of the HB purchaser function and the continuing

practice of meeting capital charges in full without extensive probing. There remain substantial uncertainties about how the system will evolve: leakage of capital charges out of the NHS to private providers is not yet of any importance in Scotland, though the forthcoming tendering of NHS services in the Stonehaven area of Grampian HB may be a landmark event; the Private Finance Initiative through which much new hospital construction may in future be financed has grown steadily in importance since the Aberdeen survey was designed and conducted; and the specification of the NHS contract pricing rule in terms of the 6% return on assets has downgraded Public Dividend Capital servicing into a residual far more quickly than could have been envisaged (Heald and Scott, 1995a). Not only is there the problem of isolating the effects of capital charging from those of the contemporaneous 1991 changes, but also the problem that the financial agenda may be perceived to have moved on to new imperatives and initiatives long before the end of the period over which the benefits of capital charging would be expected to work through.

A conclusion is that capital charging must bite (otherwise it will be regarded as a bureaucratic paper exercise) (Lapsley, 1996) but that too much bite might be dysfunctional. The efforts necessary to secure implementation across the NHS have tended to divert attention away from issues of underlying principle. For example, there remains a set of unresolved issues concerning the valuation basis. Whilst HC is generally impossible, not least because it is usually not known, DRC leads to exaggeratedly high valuations when existing hospitals have characteristics which would be expensive to replace and which would not be replicated; sandstone psychiatric hospitals and multi-storey acute hospitals are excellent examples. Make-or-buy decisions can be distorted by the effects of DRC valuation, and many Trusts have inflated balance sheets consisting of assets for which Economic Value is far lower than DRC. These issues undermine the attempt to secure a level playing field, whether within the NHS or between it and the private sector.

Better management of the NHS estate, a key objective of capital charging, requires a reconfiguration of facilities, which can convincingly be argued to require a combination of more investment, more disposals and better maintenance. The pace of recent change in modes of healthcare delivery, for example towards day surgery in the acute sector and towards community care at the expense of hospital care, has accentuated problems of functional suitability in the NHS estate. Overall, the Aberdeen questionnaire results indicate that managerial expectations in 1994 were that capital charging would lead to lower investment and higher disposals, with little effect on maintenance expenditure being anticipated. Such a view might simply be the response of (often new) managements at a time when they were still assessing the inherited capital stock, and before they were yet ready to formulate medium-term plans. If this phase is not temporary, there may emerge a substantial tension between this hesitation of Trust managements

to embark on large capital programmes without long-term contracts and the NHS Management Executive in Scotland's desire to maintain a steady programme of NHS capital expenditure. The terms of access to capital — whether through External Financing Limits or through private finance — will become a prime concern for the Boards of Trusts.

Notwithstanding the factors identified above which complicate the conduct of research on capital charging, the monitoring of NHS implementation remains a research task of high priority. Greater understanding is required of the sources of the variation of capital charges between hospitals, whether measured in terms of capital charges as an amount per average staffed bed or as a proportion of revenue expenditure. Advance on this front will help to clarify which of these marked variations can convincingly be stated to fall under the control of management and over what timescale. The most promising avenues for such work would appear to be econometric studies on inter-hospital variations and accounting case studies of particular kinds of hospitals, including those identified to be outliers in terms of capital charges. Informed debate on how far weighted capitation is empirically justified depends upon securing at least provisional answers. Consideration is also required of the ability of purchasers to make credible commitments to providers who wish to embark upon major hospital replacement programmes but who are naturally concerned at the increased vulnerability they will experience due to the sunk-cost characteristic of locationally specific health capital. Achieving the underlying objectives of capital charging — a more cost-effective NHS estate — depends upon satisfactory resolution of a number of dilemmas, the precise nature of which is now emerging.

APPENDIX

Full diagnostic information on the survey is available on request from the authors. Concerning the Likert Scale questions in Table 1, it was necessary to address two issues: first, whether there is a differential response rate by job category and, second, whether there are statistically significant differences in responses by job category. Whenever it was possible (i.e. one or more of the expected frequencies did not fall below the necessary 5) to conduct a χ^2 test on the null hypothesis that job category and whether or not a respondent answered a question were independent, the null hypothesis was rejected. The Kruskal-Wallis (K-W) test was used to test the null hypothesis that all three job categories have an identical distribution of Likert scores on particular questions. For all but one question (Q.8), the null hypothesis cannot be rejected (significance level 0.05). For these, conditional upon receiving a response, all respondents can be treated as belonging to the same population. The K-W test was repeated for differences between HB areas (χ^2 tests on differential response rates could not be performed), the null hypothesis being rejected for six out of the 11 questions (see Table 2). In relation to the wave of Trust conversion to which a provider belonged, the null hypothesis can be rejected only for Question 6 (χ^2 test on differential response rates could not be performed). Concerning the questions reported in Table 3, when χ^2 tests were conducted on the null hypothesis that job category and whether or not a respondent recorded 'don't know' are independent, the null hypothesis was rejected for all questions. When the K-W tests were conducted for job categories, the null hypothesis was rejected for all questions ('non-responses' excluded) but only for Question 13 ('don't knows' excluded). In terms of differences across HB areas, there is only one question on each basis (Q.15 when 'non-responses' are excluded and Q.16 when 'don't knows' are excluded) in which the null hypothesis is rejected. In terms of

differences across waves of Trust conversion, only for Question 13 is the null hypothesis rejected (when 'non-responses' are excluded).

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