

data are available on long term trends in exposure to sunlight in Britain to confirm that such a reduction has taken place. Reduced exposure to sunlight could have adverse effects, but we believe that any advice to increase exposure to sunlight is premature given the tentative nature of our review and concerns about the changing nature of sunlight exposure with the thinning of the ozone layer.²⁴ However, we suggest that the basis for current advice to reduce exposure to sunlight should be reviewed in a formal and quantitative manner so that the potential benefits and harm from exposure to sunlight can be conveyed to the public. The risk:benefit ratio will differ between individuals; for many people the small absolute increase in risk of melanoma could easily be outweighed by the effect of reduced sunlight on mood. A recent article in *Vogue* suggests that lay understanding is, perhaps again, ahead of medical thinking in attempting to weigh up factors for and against exposure to sunlight.²⁵ Perhaps, while we await the conclusions of such formal analyses, those of us who enjoy spending time in the sun can rest (on our deck chair, sun lounger ... or whatever) assured that the chance that we will be one of the people dying from our tan is small.

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The private finance initiative

PFI in the NHS—is there an economic case?

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This is the second of four articles on Britain's public-private partnership in health care

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The private finance initiative substantially increases the cost of hospital building. Total costs (construction costs plus financing costs) in a sample of hospitals built under the private finance initiative are 18-60% higher than construction costs alone (table 1). Shareholders in private finance initiative schemes can expect real returns of 15-25% a year.¹ The consortiums involved in these schemes charge the NHS fees equivalent to 11.2-18.5% of construction costs (table 2). If the Treasury were to finance new hospitals directly out of its own borrowing it would pay a real rate of annual interest of 3.0-3.5%. It has been estimated that the £2.7 billion Scottish private finance initiative programme will cost, at a conservative estimate, "£2 billion more than if the Treasury had acquired the assets directly."² The higher costs will be met locally through cuts in clinical spending and nationally through subsidies from NHS capital budgets.

Medical staff are deeply implicated in hospital private finance initiative schemes. Clinical directors approve and medical directors sign off the full business

Summary points

Investment under the private finance initiative costs more than public sector procurement. The annual charge for the use of privately financed facilities is between 9.1% and 18% of the original construction cost, whereas government can borrow at interest rates of 3.0% to 3.5%

The extra cost of private finance is disguised by the Treasury's insistence that NHS trusts discount costs at 6% per annum when comparing the costs of the private finance option with public sector investment

The amount of risk transferred to the private sector under privately financed deals has been exaggerated, leading to spurious attributions of additional value to private sector options

case, clinical posts are lost, and heroic targets are set for gains in medical productivity. Clinical concerns are generally met by assurances that the largely undisclosed price of the private finance initiative is well worth paying because schemes approved by the initiative offer better value for money than public procurement. This claim is based on the fact that, for approval purposes, all privately financed schemes are compared with a notional publicly funded equivalent, the public sector comparator. However, this comparison is carried out using an appraisal methodology under which the cash payments associated with each option are “discounted,” and costs are adjusted to reflect “risk transfer.” Both these factors have an influence on the results of the comparison. The appraisal methodology is prescribed in government guidance and plays a crucial part both in the selection of schemes for the initiative and in making the case for the private finance initiative as a policy.

The procurement and approval process

The procurement process currently in operation in the NHS departs from earlier approaches based on non-financial ranking of options for meeting needs.³ Now the procurement process requires that NHS trusts prepare business cases for approval by the NHS Management Executive and the Treasury. This process reflects the criteria used by those bodies in appraising schemes: financial viability and control of public spending.^{4,5}

An NHS trust makes the case for the proposed investment in an outline business case and gives an estimate of the capital cost based on standard NHS costs. Since 1994, all approved outline business cases have to be tested for inclusion under the private finance initiative. Final approval of schemes depends on trusts producing a full business case that includes an economic appraisal showing that the privately financed option represents better value for money than funding by the public sector.

Value for money and discounting (buy now, pay later)

Calculations of value for money exploit the fact that under public procurement all the costs of hospital development are paid in the first few years, whereas under the private finance initiative they are spread over 25 or 30 years. To calculate the economic consequences of spreading capital payments evenly throughout the contract period (under the private finance option) or paying them all in the first few years (under the public sector option) a discounted cashflow analysis is carried out. The principle is that money spent now or in the near future carries a higher cost than money spent several years down the road. This is because more potential to earn interest will be sacrificed by a sum that is spent immediately than the same sum spent gradually over 30 or 60 years. In other words, discounting introduces an interest rate assumption. Discounting is widely used in the private sector as it is assumed to maximise value for shareholders. Its relevance to the public sector, where profit maximisation is not the objective of investment, is unclear.

Table 1 Capital cost of private finance initiative schemes: construction costs compared with total capital costs

NHS trust	Construction cost to private sector (£m)	Total capital cost (£m)	Difference (£m)	Difference as % of construction cost
Dartford	94.0	115.0	21.5	22.8
Carlisle	64.7	85.0	20.3	31.3
Norfolk	143.5	214.0	70.5	49.1
North Durham	61.0	96.0	37.0	60.6
Greenwich	84.0	109.9	25.9	30.8
Bromley	118.0	155.0	37.0	35.8
Wellhouse	54.0	65.0	11.0	18.5

The difference between construction costs and total capital costs is usually explained as arising from financing costs incurred by the private sector during the construction period.

Table 2 Construction costs and availability payments* under the private finance initiative

NHS Trust	Construction cost (£m)	PFI availability payment (£m)	PFI availability payment as % of construction cost
Calderdale	64.6	8.7	13.5
Carlisle Hospitals	64.7	8.0	12.4
Dartford	94.0	10.5	11.2
Greenwich	84.0	11.0	13.1
North Durham	61.0	7.1	11.6
Wellhouse	54.0	10.0	18.5

*The availability payment funds private sector debt service obligations and returns to equity shareholders. A minor element of the charge also funds maintenance costs over the life of the building.



Trusts with major (>£25m) capital developments under the private finance initiative

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Cost comparisons, once discounted, are expressed as net present costs. The option with the lowest net present cost is said to offer the best value for money. In practice, this single figure is the basis of approval. Value for money is assumed to provide neutral criticism, but discounting clearly favours private finance with its protracted repayment schedule.

The level at which the discount rate is set determines whether or not private finance option shows value for money. The higher the discount rate applied, the lower the value placed now on expenditure in later years. Treasury guidance imposes a discount rate of 6%, with the effect that £100 of expenditure incurred in five years' time has a “present value” for appraisal purposes of £74.73, in 10 years of £55.84, in 20 years of £31.18, and so on (box). Note

Table 3 Effect of varying the discount rate on results of economic appraisal in Carlisle hospitals' private finance initiative scheme

Discount rate (%)	Public sector option (PSC) (£000s)	Private sector option (PFI) (£000s)	Economic advantage of PFI over PSC (£000s)
6.0	174 337	172 633	1 704
5.5	185 803	186 692	-889
5.0	198 884	202 043	-3 159
4.5	213 900	219 480	-5 580
4.0	231 247	239 388	-8 141
3.0	275 027	288 622	-13 595
0	549 882	577 048	-27 166

Table 4 Risk added to public sector comparator: net present costs over 60 years

Trust	PFI net present cost (£m)	PSC net present cost		
		Before risk adjustment (£m)	Risk added (£m)	After risk adjustment (£m)
Calderdale	1221	1191	73	1264
Carlisle	173	152	22	174
Dartford	928	881	55	937
Durham	177	153	24	177
Wellhouse	1206	1210	20	1230

PFI=private finance initiative; PSC=public sector comparator

Figures may not sum due to rounding. Figures are taken from original full business cases and may not reflect later adjustments. In some cases, figures represent the entire cost of running the hospital over 60 years, leading to very high net present costs; in others, only the services to be provided under the private finance initiative contract are included, so that the net present cost relates to the scheme alone and not to the costs of clinical activity.

that for the purposes of appraisal, the costs to be discounted are expressed in real terms.

The discount assumption affects fundamentally the appraisal outcome. Table 3 shows that at 6% the Carlisle private finance initiative scheme is slightly cheaper than its public sector equivalent and is thus held to be better value for money. When the discount rate is reduced by only 0.5%, the outcome of the appraisal is reversed and the public sector option seems preferable. The economic advantage of public sector procurement continues to increase as the discount rate is reduced. Thus, economic advantage is

Discounted cashflow analysis

The table below shows a worked example of discounted cashflow analysis, with a discount rate of 6%. The result is that expenditure of £1000 in annual instalments of £100 over 10 years, starting next year, is held to be equivalent to expenditure of £736 this year. This result depends entirely on the discount rate used—when a 4% discount rate is used, the figure is £811.

Year	Total cash flow (£)	Discounted cash flow (£)
0	0	0
1	100	94.34
2	100	89.00
3	100	83.96
4	100	79.21
5	100	74.73
6	100	70.50
7	100	66.51
8	100	62.74
9	100	59.19
10	100	55.84
Total	1000	
Net present cost		736.02

to a large extent a product of the discount rate used. How is it determined?

Determining economic advantage

The 6% discount rate does not reflect interest rates on government borrowing, any more than NHS capital charges reflect the actual cost of public sector capital. The choice of 6% was a policy decision. According to Treasury guidance, "the practical choice of 6%, from the top of the range ... is an operational judgement, reflecting, for example, concern to ensure that there is no inefficient bias against private sector supply."⁴

The 6% discount rate favours private finance and obscures the central characteristic of private finance: the higher cost of capital. Therefore, economic appraisal assumes from the outset what it is held to prove: the economic advantage of private finance.

Risk transfer

Despite the use of a 6% discount rate, comparisons of net present costs have been to the advantage of public sector options in almost all cases. However, in private finance initiative appraisal, all costs are "risk adjusted." The principle of risk adjustment is that, in order to make a fair comparison of costs between private finance initiative options and public sector comparators, account needs to be taken of risks which under public procurement the public sector carries itself, but which under private finance initiative it pays another agent, the private investor, to bear. When the cost of public sector options is adjusted to reflect this transfer of risk, the apparent cost disadvantage of the private finance initiative options disappears. In most cases this is done through adding a lump sum representing the cost of risk to the net present cost of the public sector comparator. Table 4 shows that risk transfer is valued at between £20 million and £73 million in a sample of schemes and has a decisive effect on the outcome of economic appraisal. Both discounting and risk adjustment seem to be necessary if the private finance initiative is to show value for money.

There are several problems with the risk adjustment carried out in the appraisal of private finance initiative schemes. One is that the 6% discount rate already takes account of an element of risk, as it is set at a level that is deemed by the Treasury to be higher than a risk-free interest rate. Interest rates are after all largely determined by the level of estimated risk associated with an investment. As the value for money test involves discounting costs at 6% and then adjusting the comparator for risk, the cost of risk is effectively counted twice.

A further problem is the tendency for trusts seeking approval for private finance initiative developments to ascribe risks to private finance initiative consortiums that they have not in fact taken on. Risk can only be transferred through the private finance initiative contract, by means of financial penalties imposed on consortiums for failing to meet their obligations. This basic principle is consistently overlooked in economic appraisals of the private finance initiative. At Carlisle, one of the risk supposedly transferred was that targets for clinical cost savings would not be met, and the cost of this risk was estimated at £5m.⁶ The consortium, however, had no responsibility for

ensuring that these savings would be made, and faced no penalty if they were not: £5m of additional value was thus attributed to the private finance initiative scheme on quite spurious grounds.

Construction period risks

The bulk of the risk supposedly transferred relates to the building period, the first three to five years, rather than to the operational phase, the subsequent 25-30 years. In the Greenwich Hospital scheme, seven of the eight risks said to have been transferred to private investors related to the construction phase of the project and therefore could not threaten the income of the investors during the operational phase.⁷ Restricting risk to the construction period means that income during the operational phase is guaranteed by the Treasury for the life of the contract and is sufficient to recoup virtually risk free the whole capital cost of the hospital, together with a return on the investment. This makes private finance initiatives a very safe investment.

One of the main risks during the construction period is that of cost overruns. NHS trusts have based their estimates of the risk of construction costs overrunning on historical claims about the level of cost overruns associated with earlier publicly funded schemes. One high profile scheme which is regularly used as evidence of overruns due to public sector inefficiency is the Guy's Hospital phase III development. The increase in cost at this scheme was so extreme as to affect the annual cost performance statistics for the NHS as a whole. However, the National Audit Office's report on the scheme shows that among the major factors contributing to the overrun were the effects of inflation and the new liability for value added tax that came with NHS trust status. The significance of Guy's phase III as an exemplar of public sector inefficiency has thus been exaggerated. The average increase in cost over approved tender sums for NHS capital projects has been between 6.3% and 8.4% in the 1990s.⁸ Public finance initiative business cases have in most cases assumed that public sector projects overrun by 12.5% or more. In costing its public sector comparator, the Norfolk and Norwich Trust assumed overruns of 34%.⁹

Private finance initiative business cases have tended to exaggerate the inefficiency of public sector procurement, leading to overestimation of the economic benefit of the private finance initiative. Moreover, many of the risks associated with public sector procurement arise from the relationship between NHS trusts and other parts of the public sector. Such risks can be managed internally and it is strange to assume that they should, or indeed can, be transferred to the private sector. Even if they could, why should the taxpayer pay to offload a risk that can be addressed by internal action on the part of the NHS Executive?

The market's assessment of risk

The best indicator of the extent of risk actually transferred in the private finance initiative contract is the interest rates paid by consortiums to their lenders (as distinct from the interest rate consortiums charge

NHS trusts). First wave private finance initiative schemes have achieved extremely favourable borrowing terms on bank debt and bond issues on the basis of "little inherent risk." Market interest rates have been between 4% and 5% in real terms. This suggests that in the view of funders there has been very little risk transfer.

This implies that there is little correspondence between the sums NHS trusts ascribe to "risk transfer" and the views of capital markets on the risks the consortiums have actually taken on. In practice, funders see little likelihood of the consortiums facing financial penalties under the contracts and have set interest rates accordingly. The legal advisers on the North Durham scheme informed the NHS trust that under the contract "various obstacles have been placed in the way of ... deductions being made."¹⁰ None the less, the trust valued "risk transfer" under the contract at £23m,¹¹ materially affecting the outcome of the appraisal. Similarly, when Meridian plc launched a bond issue to finance Greenwich Hospital, its prospectus announced that it had "structured the contractual arrangements for the Project such that there are intended to be few risks inherent in the Project which are retained by the Issuer." The risk transfer charged against the public sector comparator in the Greenwich scheme was £20 million.¹²

Conclusion

Formal appraisal of the private finance initiative is not an objective process: it systematically reduces the comparative advantage of public sector procurement and disguises the basis of private sector costs. High cost is ascribed to risk transfer but little risk is actually transferred. The discounting method used to compare the present value of different options is politically determined and is set well above the government's interest rates. The government's claim that the private finance initiative represents better value than public procurement is not supported, and clinicians should not allow spurious economic arguments to deflect them from criticising the clinical impact of private finance initiative developments.

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