



House of Commons
Treasury Committee

Private Finance 2

Tenth Report of Session 2013–14

Volume II

Written evidence

*Ordered by the House of Commons
to be published 12 March 2014*

The Treasury Committee

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Written evidence

Written evidence submitted by Richard Abadie

Thank you for inviting me to speak at the Treasury Select Committee hearing on 5 March 2013. I undertook to send you a note on the potential impact of the weighted average cost of capital arising from the capital structure changes discussed in the PF2 document published by Treasury.

I enclose a table below which gives a high level perspective of the potential impact of PF2. I would like to emphasise that every project is different and therefore the table below is a generalisation.

<i>% of Capital</i>	<i>Old</i>		<i>% of Capital</i>	<i>New</i>	
	<i>Cost</i>			<i>Cost</i>	
Equity 10%	x 12%	= 1.2%	Equity [25%]	x 12%	= 3.0%
Debt 90%	x 6%*	= 5.4%	Debt [75%]	x 6%	= 4.5%
Pre tax WACC		6.6%	Pre tax WACC		7.5%

* (Where current longer term 15 year, GBP swap rates are C2.7% at 5 April 2013), implying a credit margin of 6%–2.7% = 3.3%

The implication of the above calculations is that the overall cost of capital would increase due to the indicative minimum equity requirement proposed by HM Treasury.

In the New capital structure the cost of debt would have to be less than 4.8% (opposed to 6%) to make the New structure cheaper.

The above analysis does not take into account tax, the potential additional increased credit quality/security requirements needed for rated capital market issuances eg higher bonding. An identical project with higher equity would expect to have cheaper debt as the lenders would perceive a lower probability of not being paid and therefore charge less margin.

Treasury may argue that as Government is contributing 30–49% of the equity, any increase in the overall cost of capital before taking account of risk and potential losses would be cheaper to the taxpayer. From a financial structuring point of view, returns on the Government equity would effectively bolster the capital structure but only if no risk materialises would the taxpayer be better off. If, as is likely in time, the Treasury seeks to sell down this equity to the private sector or creates a private sector fund rather than using public funds to invest this money, the value of the equity (be it higher or lower than the amount invested—depending on project performance), will be crystallised at the time of sale rather than through ongoing returns on equity held.

May 2013

Written evidence submitted by Lord Deighton

The Committee has asked for written information from the Treasury to aid their inquiry into PF2. At the hearing on 22 May, Geoffrey Spence and I agreed to provide a written note covering the Treasury's cost analysis of PF2, the provisions for community use in PF2 contracts, the Treasury's risk assessment framework for the Guarantee Scheme and provide details of how risk was assessed for High Speed Two and what impact it had on the value for money assessment for this project. I will address each of these points in turn.

PF2 AND PH—COST OF CAPITAL COMPARISON

The Committee asked for a note setting out the Treasury's thinking for how the weighted average cost of capital for a PF2 project in the current market might compare to a typical bank financed PFI project.

The UK and European project finance debt markets have been affected by the global financial crisis. As a result the cost of long-term borrowing for infrastructure projects has increased and the availability of long-term bank debt has materially diminished.

The PF2 model seeks to secure long-term debt on cost efficient terms by accessing alternative sources of finance including the capital markets. Securing cost-efficient debt on a sustainable basis is likely to involve a need to attract finance from a wider source of investors, in particular institutional investors. In order to attract institutional investors a credit enhancement of the projects is likely to be required to achieve an investment grade rating. From engagement with credit rating agencies over the summer of 2012 it is clear that higher levels of risk capital will facilitate the achievement of the enhancement of the underlying rating of project debt.

As I stated at the hearing, the cost of finance is dynamic and will vary with market conditions; our view of the market at the moment is that there is strong institutional investor appetite for PPP style projects. One way to facilitate a reduction in the overall cost of using private finance is for the public sector to provide equity, a form of risk capital, alongside the private sector partners in future projects to achieve a lower geared structure. I have provided an illustrative example of such a scenario, attached as an annex. However alternative solutions

might emerge as the institutional investor market develops; for example, the Education Funding Agency is exploring a programme level debt aggregator vehicle as part of the privately financed element of the Priority Schools Building Programme and we welcome this innovation.

The ability of alternative financing models to deliver a lower overall cost has already been successfully demonstrated through the Alder Hey Hospital PFI. A Prudential M&G privately placed bond delivered the most cost effective solution as part of a funding competition which attracted strong competition from banks and institutional investors. In addition a number of Housing PFI projects, which are expected to reach financial close imminently, have recently switched from bank to bond based solutions on the basis of expected cost savings.

PROVISIONS FOR COMMUNITY USE IN PF2 CONTRACTS

The Committee asked for clarification around the provision for community use for facilities provided through PF2 contracts.

I can confirm that for the first PF2 scheme, the privately financed element of the Priority Schools Building Programme, schools will control access to their premises both inside and outside core school hours. There is no availability and performance regime outside core school hours and this means no penalty to the contractor if a classroom is out of action. A school will be able to use the facilities for community use as it wishes subject to discussions with the contractor over scheduled maintenance of the school premises. This will be addressed through a formal agreement tailored for each project and school as necessary; this will deal with the practicalities of access outside core school hours.

RISK ASSESSMENT FRAMEWORK FOR THE UK GUARANTEE SCHEME

The Committee asked the Treasury to provide more detail of its risk assessment framework for the UK Guarantees Scheme.

The Treasury operates the UK Guarantees scheme under procedures approved by a sub-Committee of the Treasury's Executive Management Board, including an internal Risk Committee that includes the Treasury's Finance Director. Risk assessment will be a commercial judgement as with all financial institutions but will draw on the published rating methodologies of the leading credit agencies and related default statistics. This will be supplemented by sector knowledge and bespoke project due diligence. Infrastructure UK has expanded its pool of commercial specialists with relevant credit assessment experience since the launch of the UK Guarantees Scheme. Decisions on the prequalification of projects and approval of guarantees are made by the Chancellor of the Exchequer, following advice on the risk profile from the Risk Committee to both the Chancellor and Treasury's Principal Accounting Officer. The portfolio of guarantees will be reviewed on an annual basis alongside the monitoring and surveillance of the underlying projects.

HS2—VALUE FOR MONEY ASSESSMENT

The Committee asked for clarification about the value for money assessment of High Speed 2 and how the project has been risk assessed.

High Speed 2 is a large and complex major government project, and receives enhanced scrutiny from the Major Projects Review Group, in partnership with Treasury and the Major Projects Authority, which challenges projects on deliverability and value for money.

More specifically, when The Economic Case for High Speed 2 was last published in August 2012 it contained early cost estimates prepared by HS2 Limited. Those cost estimates included an allowance for optimism bias an adjustment reflecting the tendency for project appraisers to be over optimistic and underestimate a project's cost. Based on the particular characteristics of a high speed rail project and the early-stage maturity of the HS2 programme, a significant allowance for risk and optimism bias was added to the HS2 cost estimates of between 61% and 64%. This was done in line with the Department for Transport's Transport Appraisal Guidance and HM Treasury's Green Book. Including the adjustment for optimism bias, the value for money assessment returned a benefits-to-cost ratio for the Y-network of 2.5 (when wider economic impacts are included)—meaning that the project will deliver over £2 of economic benefits for every £1 spent.

A great deal of progress has been made over the last 15 months since the economic case was last published. The Government intends to refresh the data and models that underpin the value for money assessments of HS2 and it will publish an update in the autumn. Separately, the Treasury is also updating the Green Book and the application of Optimism Bias for infrastructure projects to further improve the identification, transparency and cost impact of project risks in business cases.

UNCLASSIFIED

Annex

ILLUSTRATIVE FINANCING COST COMPARISON BETWEEN PF2 AND PFI

The following is intended to provide an indicative example of how the weighted cost of capital based on prevailing market rates could be cheaper under a lower geared capital structure, such as the one proposed in PF2, compared to a typical bank financed PFI structure. The figures are based on prevailing market rates.

STANDARD BANK FINANCED PFI STRUCTURE (INDICATIVE EXAMPLE)

*Assumptions**Swap Rate 3%**Bank debt pricing starting at 3.0% rising to 3.5% p.a. Equity IRR 13%**Capital Structure 90:10*

	<i>Cost</i>	<i>Proportion</i>	<i>Weighted Cost</i>
Senior Debt	6.25%	90%	5.63%
Equity (Blended)	13%	10%	1.30%
			6.93%

PF2 (INDICATIVE EXAMPLE)

*Assumptions**Gilt Rate 3%**Senior debt rating of A-**A- bonds pricing at G+200bps**Capital Structure 80:20**Public Sector Equity Share of 30%**Equity IRR 13%*

	<i>Cost</i>	<i>Proportion</i>	<i>Weighted Cost</i>
Senior Debt	5.00%	80%	4.00%
Equity (Blended)	13%	20%	2.60%
			6.60%
Public sector equity return	13%	6.0%	-0.78%
Net Cost			5.82%

Other features not factored in but which could further add to savings are:

- Equity IRR falls due to lower leverage risk.
- Equity IRR falls due to 3rd party equity funding competitions.
- Lower cost mezzanine debt used instead of equity to provide credit enhancement.
- A- bonds price more tightly (ie comparable to other similarly rated infrastructure bonds).
- Lower arrangement fee on bonds compared to bank.

June 2013

Written evidence submitted by Dr Mark Hellowell

Abstract

In December 2012, the government of the United Kingdom outlined reforms to the Private Finance Initiative (PFI). Under “Private Finance 2” (PF2), tender processes will require firms to develop bids in which institutional investors, rather than banks, provide the bulk of debt finance. To achieve this, substantial changes to the financial and contractual characteristics of the private finance model have been mandated, along with new budgeting processes that are ostensibly designed to ensure a “level playing field” between public and public financing for capital projects. Given the status of the UK’s private finance market (ie as the world’s largest), the reforms are likely to have a major influence on infrastructure policy and practice across the world. This article provides a critical commentary on PF2, assessing its impact on the cost of projects and the financial reporting regime.

PRIVATE FINANCE 2: AN ASSESSMENT

1. INTRODUCTION

There is a growing need for investments in hospital facilities to improve the productive efficiency and quality of health services. Across the developed world, health care is delivered in facilities that are: 1) too large (Posnett 2002); (2) in the wrong place (Thomson *et al* 2009); (3) generating excessive maintenance and utility costs (Stewart 2012), and (4) failing to exploit the efficiency- and quality-enhancing opportunities afforded by changes in clinical practice and technology (Thompson and McKee 2004). Policy-makers in many countries are in the process of reducing hospital capacity and replacing inpatient facilities with less costly alternatives such as community-based care centres (McKee & Healy 2002). However, hospitals continue to absorb a large proportion of total health expenditure in most countries (Rechel *et al* 2009), and improving their efficiency will play an important role in safeguarding the financial sustainability of health systems.

In an era of tight capital budget constraints, many hospital organisations have engaged with providers of external capital to finance their investment requirements. In recent years, publicly-financed health care organisations in Australia, Canada, France, Italy, Spain and the United Kingdom (among other countries) have made extensive use of private finance arrangements in which specialist investors organise the financing, construction and maintenance of health care buildings, receiving in return a periodic fee paid by a public authority.

In December 2012, the government of the United Kingdom outlined plans to reform the Private Finance Initiative (PFI), under which 717 contracts have been signed with a combined capital cost of £60 billion (HM Treasury 2012a). The introduction of “Private Finance 2” (PF2) (HM Treasury 2012b) constitutes the most comprehensive attempt yet by a government to increase the supply of finance for public capital projects. Since the onset of the global financial crisis, the supply of finance for such projects has fallen while the price of new loans has risen. The increased cost of finance is generally passed by the private sector to the public authority in the form of higher periodic payments (National Audit Office 2010), and higher price have driven a reduction in effective demand among public authorities (OECD 2012).

In addition, a range of influential policy actors, such as parliamentary committees, auditors and academics, have questioned the value for money of private finance compared to the public alternatives (Public Accounts Committee 2012, National Audit Office 2010, Helm 2009). The government has also been urged to address anomalies in public sector budgeting and accounting frameworks which generate incentives to promote the use of PFI over conventional procurement (Irwin 2012, National Audit Office 2009a, Treasury Select Committee 2011). In a forward to the paper in which the PF2 proposals were launched, the Chief Secretary to the Treasury Danny Alexander wrote that the initiative would “help to address the fundamental concerns that have been expressed by Parliament, the public sector and taxpayers about PFI in the current climate” (HM Treasury 2012b, p.3).

Given the status and prestige of the PFI as the world’s largest private finance programme (Allen & Overy 2010), the reforms are likely to have a major influence on infrastructure policy and practice internationally. This article provides a critical evaluation of PF2, and proceeds as follows. Section (2) outlines the effect of the financial crisis on the supply of debt capital for PFI projects and the impact this has had on loan prices. Section (3) reviews government documents which outline the distinctive institutional characteristics of PF2. It is explained how these characteristics might in principle address the problems of constrained supply and high prices. Section (4) outlines a theoretical framework, and applies this to the reforms to evaluate the cost impact of PF2. Section (5) provides an analysis of the extent to which anomalies in public accounting and budgeting processes have been addressed through the PF2 reforms and Section (6) concludes.

1. THE DEATH OF PFI

2.1 *The PFI: contract design and capital structure*

Under the PFI, the responsibility to design, build and maintain physical assets is assumed by a consortium of private sector investors, typically constituted as a special purpose vehicle (SPV) to ensure that the project is “non-recourse” and that investors have limited liability for project outcomes. In return, the SPV receives revenues from charges paid by the public authority, contingent on the contracted assets being made available for use.

Typically, capital expenditure is structured on the basis of circa 90% *debt* (which entitles the holder to a specified stream of cash flows in the form of capital payment and interest) against 10% *equity* (which entitles the holder to all cash flows left in the project after meeting operational and financial costs) (National Audit Office 2012). Both debt- and equity-holders are remunerated exclusively by the cash-flows generated by the project, and investors face uncertainty about expenditures and revenues. It is the need to minimise this uncertainty that generates the incentives for effective project planning and delivery. For example, if a project is delivered at a higher capital cost than was forecast at financial close, or outturn revenues are lower than those expected, *equity-holders* are unlikely to achieve their expected return. Therefore, they have a strong incentive to manage construction and maintenance services assiduously. In extreme cases of underperformance, SPVs may default on their obligations to lenders. Therefore, *debt-holders* have a strong incentive to carry out their regulatory functions well—for example, in assessing the robustness of project planning before and after

financial close, eliminating errors in financial projections, ensuring risks are allocated to the appropriate firm in the consortium, and “stepping in” to manage projects that are underperforming (Yescombe 2008).

One outcome of transferring risk to investors has been enhanced project management performance relative to conventional procurement, particularly in terms of post-contractual cost- and time-certainty (National Audit Office 2009b; Allen Consulting 2007). However, such certainty should not be taken as the overall arbiter of value for money. It is evident that a public authority that pays a premium for certainty (whether through a PFI or some other form of fixed-price, availability-based contract) achieves poor value for money if the price paid to achieve that certainty is excessive. Therefore, it is important to set against the benefit of greater certainty against the fact that the expected returns to PFI investors are higher than those expected by purchasers of UK government gilts (as shown in sections below). As the cost of finance is a large component of the cost of capital projects, the economic case for PFI over conventional procurement has rested on its ability to achieve better value through savings in construction and maintenance that are sufficient to offset the higher finance cost (National Audit Office 2009a).

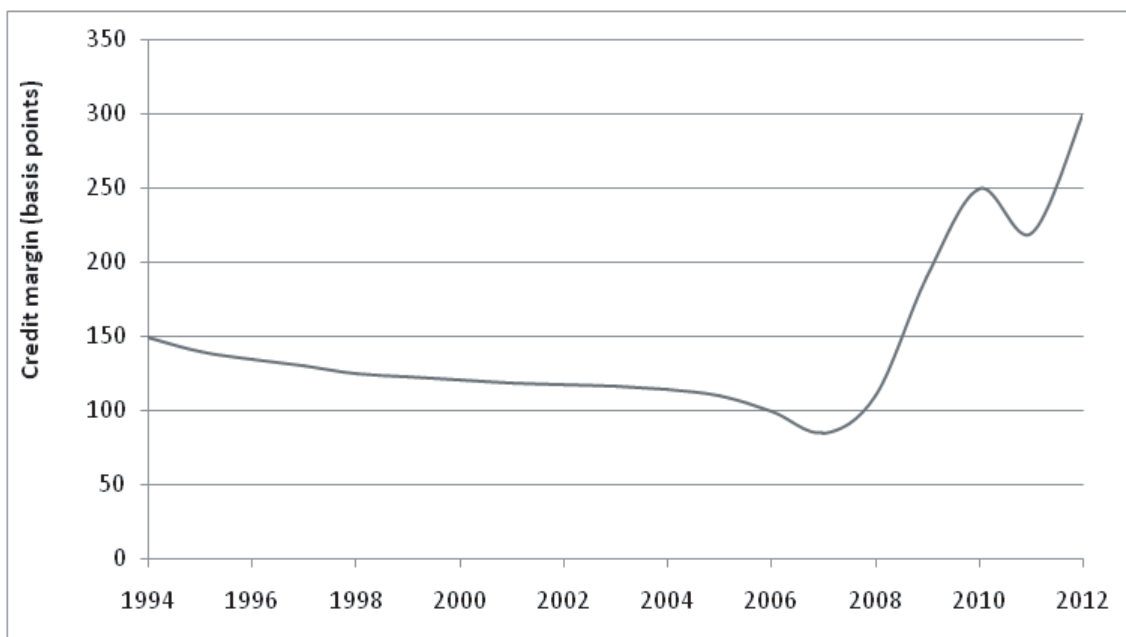
2.2 The impact of the financial crisis

Prior to 2007, project bonds provided an alternative source of funding to bank loans (EPEC 2010) and this competition contributed to a decline in credit margins (ie that component of the overall rate of interest levied by the lender that is additional to its own cost of raising fixed-rate funds), as shown in Figure 1. The credit risk associated with these bonds was moderated by a guarantee, or *wrap*, provided by one or more monoline insurers, such as Ambac and MBIA. Through the wrap, the monolines took on the credit risk (ie the possibility that the actual returns on a loan may differ from those that the lender expects, these differences resulting in financial losses) associated with the debt in return for a fee (Hellowell 2010).

This enabled bond investors to purchase an asset with the same credit rating as the monolines themselves (usually AAA), and removed the need for bond investors to carry out detailed due diligence of the underlying credit quality of the debt (Yescombe 2008). On this basis, investors were willing to accept low rates of interest, such that the overall cost of debt finance, including fees, was often lower than that charged on bank loans (Hellowell 2010). However, during the 2000s, monolines began to wrap riskier asset classes, including mortgage-backed securities. In 2007, when defaults occurred on “sub-prime” mortgage books, the monolines were exposed to financial losses, and the ratings of all the monolines active in the European project finance markets were either downgraded or withdrawn. Following this, pension funds and insurance companies, which were the major sources of demand for AAA-rated assets (but had not developed the skills required to assess the credit quality of PFI debt) elected to exit the market.

Figure 1

INCREASE IN CREDIT MARGINS APPLIED IN PFI TRANSACTIONS, 1994–2012



Source: ThomsonOneBanker (2013)

Since the exit of the monolines, PFI projects have been dependent on commercial banks (alongside the European Investment Bank (EIB), a multilateral development bank owned by the member states of the European Union with €30 billion of PPP assets in 2012) as the main providers of long-term debt. Although

commercial banks along with the EIB continued to lend to PFI projects after the onset of the financial crisis, various factors combined to generate an increase in the required credit margin, including:

- (i) concerns over long-term liquidity, in response to rising uncertainty and a higher cost of borrowing in the inter-bank (LIBOR) market;
- (ii) banks' inability to underwrite and syndicate project debt, with a resulting dependence on "clubs"—groups of banks, each contributing a fraction of the total debt required—for funding; and
- (iii) a certain degree of opportunism among the banks that were still active in the increasingly oligopolistic debt market (KPMG 2009).

In addition to rising debt prices, the terms on which banks were willing to provide became more onerous from the perspective of SPVs and public authorities. Banks began to insist on shorter-term loans, or loans with strong incentive for refinancing, including both "hard" and "soft" mini-perms. In a "hard" mini-perm, the maturity of a project's debt is less than the duration of the contract, so that an SPV has to refinance its debt early in a project's operation. Since SPVs are unwilling to accept refinancing risk, this is borne by the public sector, creating significant budgetary uncertainty since if a replacement loan is more expensive than the original loan, this increases the unitary charge (KPMG 2009). With "soft" mini-perm structures, there is a longer legal maturity date, but refinancing is incentivised through margin "ratchets" (ie periodic increases in the margin applied to the loan) and "cash sweeps" (triggered at a certain date, after which free cash flow generated by a project is used to prepay the debt outstanding rather than funding the returns to SPV investors). These terms have led SPVs to levy a higher charge than would otherwise be the case.

As Figure 1 shows, loan pricing stabilised during late 2009 at margins of *circa* 250 basis points, and began to fall in 2010. However, a number of factors then had a major impact on debt markets, with the result that credit margins reached 300 basis points or more in late 2010. The euro sovereign debt crisis, combined with a downturn in the British economy, led to concern among banks about the quality of their assets (HM Treasury 2012b). In addition, stricter capital adequacy regulations under the Basel III Accord, which makes long-term lending costly in terms of risk-weighted capital adequacy ratios, has had a significant impact on the debt markets (Reviglio 2012). These regulations, under the control of the Bank of International Settlements, seek to ensure that banks' long-term capital is sufficient to support the risks on their assets. Basel III raises required capital ratios incrementally from 8% in 2013 to 10.5% in 2018. Banks are responding to this accord by reducing risk-weighted assets (the denominator in their capital ratios) rather than increasing equity capital (the numerator). One way of doing this is to reduce lending into sectors such as infrastructure, which require funding instruments with long maturities.

This combination of factors has resulted in debt pricing norms that are: (i) high by historical standards (National Audit Office 2010); and (ii) no longer indicative of the credit quality of the debt, but by liquidity and capital management risks (Hellowell and Vecchi 2012). As the UK government (which has access to a highly liquid and efficient sovereign debt market) is not subject to these risks, the associated premium charged by lenders is clearly an element of bad value for money from the public sector perspective.

In common with other large project finance markets (Shugart 2006), government departments undertaking PFI projects are required to seek assurance that the PFI procurement route reflects best value for money by comparing the expected net present cost of a PFI project against an equivalent project undertaken via conventional procurement. Academic studies (eg Gaffney *et al* 1999, Edwards *et al* 2004, Shaoul 2005) and studies by the National Audit Office (eg 2009b; 2010) have expressed concerns about these processes, in which the typical estimate of the PFI cost advantage lies in the range of 5% to 10% (and in some cases even less). As credit margins have increased, the slender value for money benefits indicated by these financing method comparisons have been eroded, suggesting increased risk to value for money (National Audit Office 2010).

Business cases for contemporary PFI projects forecast an average interest rate on debt of 7.5%, while primary equity investors (ie those that commit capital during a project's development and construction) generally set a minimum pre-tax Internal Rate of Return (IRR) (ie the rate on a project that, when applied as a discount rate to a stream of expected periodic cash flows, produces a Net Present Value (NPV) of zero) of 15% (National Audit Office 2012). Assuming a gearing ratio of 90/10, this implies a Weighted Average Cost of Capital (WACC), taking into account the rates of return on debt and equity and the contribution of each of 8.44%. For comparison, at the time of writing, the yield on a 20-year UK Gilt is 2.65%, according to the "Bonds and Rates" section of the *Financial Times* (<http://markets.ft.com/research/Markets/Bonds>). Consequently, at the time of writing, private finance increases the cost of capital by perhaps 5%.

In the context of capital constraints, high prices, demand among public authorities has waned. Few of the £5.4 billion of projects approved by the coalition government since May 2010 have reached financial close (HM Treasury 2012a). By March 2012, the government was projecting that just £1.36 billion of projects would reach financial close in 2012/13, relative to the £4 billion plus on average between 2000 and 2008 (HM Treasury 2012a).

2. THE BIRTH OF PRIVATE FINANCE 2

From 2011 onwards, the UK government has been pursuing ways of reducing the dominance of commercial banks in the infrastructure financing markets and increasing the contribution of alternative investors, such as

pension funds and insurance companies (HM Treasury 2011). For example, in March 2011, the government signed a Memorandum of Understanding with UK pension funds to find ways of increasing investment in public infrastructure, resulting in the launch of the Pension Investment Platform in July of that year (HM Treasury 2012b). However, in terms of actual investments, little has been achieved. Appetite for PFI debt assets has proved to be limited among institutional investors, especially for original “greenfield” investments that require specialist human resources to assess project risks (Inderst 2009). (As noted previously, pension funds and insurance firms had been involved in the PFI market prior to 2007, but their involvement was underpinned by the “wrap” provided by the monoline guarantors, obviating the need for due diligence of individual SPVs and projects.) In addition, the Solvency II protocol, which codifies long-standing European Union directives on the insurance industry, introduces a minimum capital requirement for insurance firms, and it is widely believed in government and the industry that similar principles will be adopted by pension fund regulators following a review of the EU Pensions Funds Directive (HM Treasury 2012b). Recent analysis by the ratings agency Fitch (2012) concludes that anything less than a single-A rating for debt securities would make institutional involvement uneconomic in this context.

Under PF2, government tender processes will require bidding consortia to develop proposals in which pension funds and insurance companies, not commercial banks, provide the majority of the debt finance (HM Treasury 2012b). Accordingly, the changes incorporated in new standardised contracts (HM Treasury 2013a), which replaces the fourth version of the *Standardisation of PFI Contracts Guidance* (HM Treasury 2009), which all public authorities in England are officially mandated to use, are designed to generate assets that will carry the A-rating these investor types require.

There are two particular elements that may, in principle, achieve this. First, certain risks that were borne by the private sector in PFI projects—in particular, those affecting estimated *utilities* and *insurance* costs—will be borne by public authorities in PF2. In terms of utilities, volume risk will be allocated to the public authority, but the project company will retain responsibility for the design of the building against agreed energy efficiency standards. If the utility usage is higher than the efficiency standards in the outturn, the project company will be required to rectify thermal or other deficiencies within the building, or make a compensatory payment to cover the public sector loss. In terms of insurance, the government recommends self-insurance by the public sector, and provision of an indemnity for projects with a dispersed asset base and reduced risk of catastrophic loss. These changes represent an evolution of the traditional risk-allocation model which has influenced contract design around the world (Allen & Overy 2010) but, as they relate to relatively marginal components of the overall risk quantum, they are unlikely to have a major impact on value for money.

Another recent related contractual change that is often associated with PF2 (not least by the government itself) is the sanction against the inclusion of “soft” facilities management services (eg catering, cleaning and security) within the bundle of activities transferred from the public sector to SPV ownership and control. However, as the exclusion of soft services has been standard practice in the market for some time (Hellowell 2010), this paper does not evaluate the value for money impact of this. It is evident, however, that the removal of these services from the PFI/PF2 contract undermines to some degree the “bundling” argument that is at the core of the economic rationale for the model (see eg Hart 2003, Bennett and Iossa 2006; Iossa and Martimort 2012). More intuitively, it might be argued that the smaller the range of activities and risks transferred to the SPV, the lower the probability that the efficiencies generated by private ownership and control will be of a sufficient scale to offset the private sector’s higher cost of capital.

Second, and of far greater economic salience, is the requirement that consortia reduce the ratio of debt-to-equity, or gearing, proposed in their bids for PF2 contracts in comparisons with previous practice under PFI (HM Treasury 2012b). Henceforth, tender documents will require bidders to bid on the basis of 20% to 25% equity, rather than the 10% that has become the norm for PFI projects. The lower level of gearing will strengthen an SPV’s ability to absorb fluctuations in cash-flows, reducing the impact on the project company’s ability to make scheduled debt service payments. It may also enable SPVs to respond more flexibly to changing public sector requirements over the whole life of the contract. However, as the government itself acknowledges, this undermines to some degree the benefit of a project finance structure, which usually offers a lower Weighted Average Cost of Capital than other models since “a high proportion of the funding is derived from debt rather than higher-cost equity” (HM Treasury 2013a, p.282).

3. PRIVATE FINANCE 2 AND VALUE FOR MONEY

If it is assumed that market rates for equity and debt remain unchanged, the intended change in capital structure (from 10% to 25% equity) will increase the Weighted Average Cost of Capital by *circa* 15% (Table 1). The analysis assumes a swap rate of 3% per annum (approximating the annual mean of the daily rates recorded on the “Markets Data section of the *Financial Times* (<http://markets.ft.com/research/markets/data-archive>), a credit margin of 3% per annum which ratchets to 3.5% per annum 50% of the way through the operational period of the contract (reflecting the data and analysis in section 2, an Equity Internal Rate of Return (IRR) of 15% (approximating the mean pre-tax nominal Equity IRR on 120 health sector PFI contracts analysed in Vecchi *et al* (2013)) and a gearing ratio of 90:10.

Table 1

BANK-FINANCED PFI STRUCTURE VERSUS PF2 (CURRENT RATE)

	<i>PFI</i>			<i>PF2</i>			
	<i>Proportion</i>	<i>Cost</i>	<i>Weighted Cost</i>	<i>Proportion</i>	<i>Cost</i>	<i>Weighted Cost</i>	
Equity	10%	15%	1.5%	Equity	25%	15%	3.75%
Debt	90%	6.25%	5.63%	Debt	75%	6.25%	4.69%
Pre-tax WACC			7.13%	Pre-tax WACC			8.44%

The implication of Table 1 is that the Weighted Average Cost of Capital will increase as a result of PF2, due to the minimum proportion of equity required by the Treasury. With gearing of 75/25, the cost of debt would have to fall by more than a quarter, to 4.8%, to generate a lower Weighted Average Cost of Capital. If the result of the move to PF2 is that public projects carry a higher capital cost than with PFI, for a lower level of risk transfer, this raises questions about the value for money case for the reform.

However, there are three features of the new approach that may serve to moderate this cost (See Box 1). First, it is possible that, as equity substitutes for debt, it will be perceived by investors as less risky with the result that expected returns will eventually fall. This effect may be strengthened by the introduction of *funding competitions* for a portion of the equity, enabling less established investors to enter the market and increasing the degree of competitive tension during the procurement phase. This is likely to place some downward pressure on expected equity returns in the longer term. Second, a quantum of *public sector capital* will be included as part of the equity component of a project's capital structure, which may reduce the effective cost of capital for the public sector. Third, assuming the government succeeds in encouraging the *capital markets* into projects, interest rates on debt capital may in the long term come down.

Box 1

SUMMARY OF THE MAIN REFORM PROPOSALS IN PF2

Equity

- **Funding competitions** will be introduced for a proportion of the private sector equity to attract long-term investors into PF2 projects prior to financial close
- The public sector is to act as a **minority equity co-investor** in PF2 projects, providing share capital and loans equal to 25–49% of the total equity quantum

Debt

- Bidders are required to propose **less debt-heavy** capital structures to enable access to long-term institutional investor finance through the capital markets.

Risk Transfer

- Certain risks associated with **utilities costs, insurance, construction site risks** and the risks of **changes to employment law** will be borne by public authorities.

Budgetary Control

- A **control total** is to be introduced for all commitments arising from off-balance sheet PF2 contracts signed, providing a hard budget constraint for investments

Source: Adapted from HM Treasury (2012b)

4.1 Capital structure, expected returns and market competition

Treasury officials have argued that as equity substitutes for debt it will become less risky and returns will fall correspondingly (Spence 2012). The inspiration for this view appears to be the *debt-irrelevance theorem* of Modigliani and Miller (1958) which states that, in a perfectly competitive capital market (ie one with no regulation, taxes, transaction costs, information imperfections or agency problems) the average cost of capital for a firm (such as an SPV) is invariant to the method of financing. While debt finance will, because of its higher priority claim on project cash-flows, be cheaper than equity financing, simply increasing the amount of debt used to finance an activity will not reduce the overall required rate of return. Rather, as equity substitutes for debt, the remaining equity becomes less risky, as the lower interest payments to creditors make the cash flows claimed by the equity-holders less volatile. The mix of debt and equity is important, because it will determine the financial robustness of the company, especially the risk of financial distress. But the firm's average cost of capital is determined only by the underlying risks associated with the firm's activities.

It is evident that the assumptions underpinning this result are restrictive, and may not hold in practice. There is strong evidence that the expected return to PFI investors has remained stable (within the range of 13–15%) over the two decades of the programme's existence. A study by PricewaterhouseCoopers and Franks (2002) found that, from the mid-1990s to 2001, the mean expected Equity IRR fell from over 15% to 13.5%, and it was implied that further reductions were likely as supply adjusted to the increase in demand associated with the Labour government's social infrastructure investment programme. However, the National Audit Office (2012) reviewed the financial models of 24 SPVs associated with PFI projects signed between 2005 and 2009, and found expected Equity IRRs ranging from 12% to 17%, with a mean of 14%. An earlier study showed that 14 school projects let between 2006 and 2008 had expected equity returns in the range 12% to 15%, with a mean of 14.2% (National Audit Office 2009c).

This stability in the expected return to equity been observed despite strong evidence of the robustness of this asset class. Analysis of survey data by the National Audit Office (2012) found that actual equity returns are more likely to exceed, rather than fall short of, those expected by investors at financial close. In 84 of the 118 contracts surveyed by the auditors, equity-holders were forecasting an Equity IRR that exceeded (often significantly) that which was expected at financial close. Indeed, in a succession of reports, the National Audit Office has compared the Equity IRR expected by investors at the point of contracts being signed against that expected after bank loans have been refinanced or equity assets have been sold in the secondary market after construction has been completed. In many cases, the increase in the expected return following such transactions has been substantial. For example, on the Norfolk and Norwich University Hospital Trust's PFI contract, the expected Equity IRR increased from 18.9% at financial close to 60.4% after investors refinanced their loan—a transaction that lowered the interest rate, reduced cover ratios (allowing cash to be taken out of the project) and increased the term of the debt (reducing the principal amount to be repaid annually) (National Audit Office 2005). Returns to investors can also be increased by selling their equity. So long as the buyer of the asset is willing to accept a lower return than that expected by the vendor, sales can result in large capital gains. A recent report found that investors have secured an IRR of up to 40% after selling equity (National Audit Office 2012).

Industry research and investor relations literature has sought to identify the reasons for the strong performance of this asset class. The reasons include:

1. the creditworthy nature of state counterparties (Ryan *et al* 2006);
2. the ability to transfer project-related risks, including construction and operational risks, to contractors (Moody's 2012);
3. the low exposure to the economic cycle (Balfour Beatty 2010; Carillion 2010; John Laing 2010; Standard & Poor's 2006); and
4. the low correlation of returns to other investment classes (International Public Partnerships 2010; Weber and Alfen 2010).

Corporate finance theory dictates that, in an efficient market, information about the level of risk associated with an asset class results in a rapid adjustment in the risk premium and thence the expected return (Fama 1970; 1991). The fact that this has not happened in the case of PFI has been examined by the National Audit Office (2012). It found that investors in this market price equity by reference to a pre-defined internal "hurdle-rate" required by their investment committees, rather than by reference to the specific risks of the project (unless there are higher risks involved, such as traffic demand risk). In addition, lenders' controls can act to underpin minimum investor returns. Agreements between lenders and SPVs specify "cover ratios" (ie the excess of cash-flow over scheduled debt payments) for the minimum amount of cash that the latter must generate to cover its debt service obligations, after paying its operational costs, and this reserve has had a major influence on the minimum expected return a bidder is able to accept. It is evident that the hurdle rate approach, combined with conservative lender requirements, could lead to the development of a "norm" in expected equity returns. In this case, returns may be insensitive to changes in the risk profile of projects associated with a lower gearing ratio.

As noted, the Treasury intends to structure PF2 procurements so as to widen the sources of equity finance and encourage longer term investors, such as pension funds, into projects at an earlier stage than has been normal in the past (HM Treasury 2013a). Under PF2, such investors will be invited to take part in an *equity funding competition*, designed to enable new classes of equity to invest (alongside the preferred bidder) in projects during the final stages of procurement. In principle, this may have the impact of reducing expected returns since: (i) market entry by new investors will increase the level of market competition, which has hitherto been insufficient to bring equity prices to fundamental value; and (ii) introducing more sophisticated methods of capital budgeting and allocation. Over time, these developments may render unsustainable the pricing norms that have developed through the hurdle rate approach practiced by incumbent firms, and therefore a gradual reduction in the expected return to equity investors.

4.2 *The inclusion of public sector equity capital*

In addition, the inclusion of government equity in the capital structure will reduce the effective Weighted Average Cost of Capital of PF2 projects since the public sector will earn a share of the cash flows proportional to its stake. The intention is that all dividends and income from shareholder loans will be paid to the Treasury,

but cash-flow will be channelled back to the contracting authority, such that the net cost of the PFI contract will be lower (HM Treasury 2013b). The extent of the reduction in the cost of capital this represents will depend on the proportion of equity provided by the public sector, as shown in Table 2. According to evidence provided by the Treasury to the Treasury Select Committee (2013), the proportion of public sector equity will be no more than 49% of the total equity (so that the SPV is majority owned by the private sector) and no less than 25% (so that the public sector has a right under company law to veto board decisions). As the table shows, given current market rates (as per Table 1), a public equity stake of 25% of total equity reduces the net cost of capital by 0.94% to 6.6%, while a 49% share of total equity reduces the net cost by 1.84% to 7.5%.

From an economic perspective, Table 2 overstates the benefit attributable to the public sector equity stake, for three reasons. First, there is an opportunity cost to the equity investment equal to the benefits accruing to an alternative allocation, for example using the money to buy financial securities or to pay off public sector debt. Second, the investment is subject to project risks, and the actual return may be higher or lower than that projected at the time of financial close. Third, although there may be some advantages to having a public official on an SPV board, for example in reducing the asymmetry of information between the public and private sectors in terms of the performance of the project, it is unclear how officials will balance their fiduciary duties owed to the SPV against their broader public interest responsibilities. If the consequence is that the incentive structure designed to stimulate effective project delivery is compromised, the resulting costs will offset the benefits of a lower effective cost of capital.

Table 2
EFFECT OF PUBLIC EQUITY STAKE ON NET COST OF CAPITAL

	<i>Proportion</i>	<i>Cost</i>	<i>Weighted Cost</i>
Private equity	25%	15%	3.75%
Debt	75%	6.25%	4.69%
Pre-tax WACC			8.44%
Public equity (25%)	6.25%	15%	-0.94%
Net WACC			7.5%
Public equity (49%)	12.25%	15%	-1.84%
Net WACC			6.6%

4.3 Changes to capital structure, type of lender and the cost of debt

As gearing falls, the cost of debt may diminish as lenders perceive a lower probability of default and therefore charge a lower margin. Whether this occurs will depend on the extent to which institutional investors choose to enter the market. As noted above, in order to offset the higher Weighted Average Cost of Capital attributable to lower gearing (before making an adjustment for the effect of the public sector equity stake), market entrants will need to undercut the current bank rate by about a quarter (see Table 1).

The cost of debt for PFI projects has been high relative to what might be expected given the risks being borne by lenders and investors, and this anomaly has become more pronounced since the global financial crisis (KPMG 2009). In a recent study of 805 loans identified as relating to PFI/PPP contracts in the UK, Europe, Oceania and Asia, Moody's (2012) that the 10 year cumulative default rate is 3.83%, which is consistent with 10 year cumulative default rates for corporate issuers in the Baa ratings category. This is also lower than the 10 year cumulative default rate for the Infrastructure sector of 4.72%, and substantially lower than the 10 year cumulative default rate for project finance bank loans overall (which includes sectors such as mining, telecoms, power, oil and gas and manufacturing), of 10.32%. Moody's report concludes that the results of credit defaults "support the view held by many market participants that PFI/PPP is a discrete sub-sector lying at the low-risk end of the project finance spectrum" (p.55). Despite this, the difference between the mean credit margin on PFI loans versus project finance loans was just 50 basis points on average over the period 1999–2009 (National Audit Office 2010).

The fact that bank loans have contained an excessive risk premium in the past increases the likelihood that the entry of institutional investors will lower the cost of debt, especially given the recent increase in credit margins attributable to (a) stricter capital adequacy regulations under Basel III, (b) concern among banks about the quality of their assets, and (c) the opportunistic pricing of the few banks left in the market. However, at least in the short-term, a substantial decrease in the cost of debt is unlikely. With the pipeline of projects standing at a relatively modest £1 billion (HM Treasury 2012b), the incentive for investors that have, collectively, trillions of pounds of assets under management to incur the costs of a move into the market is weak unless debt prices are attractive by comparative standards.

More seriously, the constraints imposed by Solvency II (and equivalent Standards likely to be implemented as part of the review of the EU Pensions Funds Directive) make long-term, illiquid investment very expensive for institutional investors in capital management terms, to some extent mirroring the impact of Basel III on the

banks. Capital charges are, in fact, higher for financial products with same rating but longer maturities (Reviglio 2012). Even though infrastructure assets tend to exhibit lower default risk and higher recovery rates than corporate bonds, the effect of regulation will make the former more expensive in capital management terms. Under the Solvency II standard formula, a A-rated bonds and a Triple-B rated bonds with the same duration of 25 years would attract exactly the same capital charge (of more than 32%). It is not therefore clear that the level of credit enhancement that is likely to be generated by lower gearing will be sufficient to make PF2 debt investments economic for these institutional investors.

4. BUDGETING AND FINANCIAL REPORTING FOR PF2

It can reasonably be asked why a government that can, at the time of writing, borrow at less than 3% is willing to borrow at up to 8.5%, especially given (a) the Treasury's view that this market is no longer pricing debt in line with credit default risk, and (b) the erosion of the budgetary incentives to pursue private finance. It is sometimes argued that capital markets are for practical purposes near enough perfect so that the cost of capital revealed by the WACC on private capital investments reveals the cost of risk inherent in producing the specified output (eg Currie 2000). If this is true, the greater cost-efficiency produced by the ownership, bundling and risk transfer features of the PFI/PF2 model, which have observably led to good project management performance could generate a lower cost overall. Whether this is true in a concentrated market like PFI/PF2 is questionable for reasons explored. But it is much less likely to be true in the market of 2013, in which concerns about the quality of existing assets, liquidity risks and supranational financial sector regulations place a floor on the minimum acceptable return that is high relative to the level of project risk being borne.

For successive governments, the economic costs and benefits of private finance have been less important than budgetary considerations (Treasury Select Committee 2011). The advantages accruing to the "off balance sheet" features of private finance contracts have been a major factor for spending departments (including the devolved administrations, which are unable to borrow) and the Treasury (National Audit Office 2009a). For departments, private finance has enabled investment to take place over and above their allocated investment budgets. For the Treasury, private finance has allowed politically-important projects to go ahead without the associated expenditure scoring immediately on measures of the country's fiscal position (Hellowell 2010). These anomalies in the financial reporting processes have given rise to criticism that the approach creates distortions in investment and financing decisions (Monteira 2007). This view was aired by the coalition parties themselves while in opposition, and the government has said it will, with PF2, create a "level playing field" between different financing options to ensure that efficiency considerations are paramount (HM Treasury 2012b).

This section explores the veracity of this claim by examining three levels of reporting for PF2—accounting, national statistics and the budgeting regime.

5.1 *The accounting treatment*

Each PF2 will be classified as a public or private asset in the financial accounts of the public authority involved. Prior to April 2009, this process was governed under UK (GAAP) standards which allowed accountants and auditors to assess whether the assets created through a project belonged in substance to the public sector or the private sector. The assessment was based on an economic "risk and reward" criterion (Heald 2008). The usual interpretation of this was that, since most project risks (construction and availability risks) were transferred to the private sector, the assets involved should not be reported on the public authority's balance sheet. Under this system, some 99% of NHS PFI assets by capital value were recorded off balance sheet by public sector auditors (ibid). However, since April 2009, the public sector has moved from domestic to international (IFRS) accounting standards. This operates according to a different theoretical framework to that of GAAP, in which the central criterion for balance sheet allocation is who "controls" the asset, rather than the entity that carries the "risks and rewards". This criterion considers two features in particular: the control or regulation of the services the private sector partner is contracted to provide; and the control over the residual value of the assets should the contract be terminated. In other words, if a government retains ultimate responsibility for an asset, then it "controls" that asset and should record it on its balance sheet. As a result of the shift in focus from who carries the "risk and rewards" to who "controls" the asset, most relevant assets are now recorded on the balance sheets of the public authorities involved. For this reason, ministers can state that new PF2 assets are on balance sheet in good faith.

5.2 *The statistical treatment*

It does not follow, however, that capital investment secured under the PF2 programme will contribute to the national debt in the same way as conventionally financed projects. This is because the national borrowing statistics are reported under the European System of Accounts (ESA) framework, which continues to apply the "risk and rewards" criterion for projects of this type. As long as project risks are deemed to have been passed to the private sector on a project (ie the risks associated with constructing the contracted facility and keeping it open and available for the public authority's use), then the project is recorded off balance sheet and the investment does not score in the debt measure. Most PF2 investments will continue to be accounted for in the private sector under ESA, and will therefore be off-balance sheet for the purposes of compiling UK debt and

deficit statistics (Spence 2013). Given the salience of these statistics in the current fiscal context, the attractiveness of this for government is evident.

5.3 *The budgeting procedures*

Just as the capital values of most PF2 projects will not be recorded in the national debt statistics, the capital expenditure delivered under the programme will often be additional to the capital budgets of spending departments. As with the calculation of the UK government's debt and deficit, the level of capital expenditure will continue to be measured according to the ESA, and in most cases this will result in off balance sheet status. There is, therefore, a fundamental difference between the current budgeting procedures and accounting procedures, generating a degree of public confusion which may be useful to an opportunistic administration. This difference has a major impact on the recognition and control of financial commitments originating from PF2 projects relative to projects that are publicly financed, for which the full investment cost is immediately reported in the government budget. As PF2 will be off-balance sheet under ESA, they do not require such reporting—rather, unitary fees are recorded against the budget as they are incurred. Under PF2, most projects will be structured to ensure off-balance sheet treatment under the ESA, and thus the incentive to promote PF2 over other forms of procurement is preserved.

In outlining the PF2 model in December 2012, the Treasury reiterated its earlier decision, announced at the 2010 Spending Review, to remove the “PFI Credits” regime, under which public authorities were provided with a revenue stream to support the revenue costs associated with PFI projects. The Treasury claimed that the decision would “create a level playing field for all forms of public procurement and remove the budgetary incentive the credits regime presented...ensuring that procuring authorities select the delivery route which provides the best value for money” (HM Treasury 2012b, p.24). It is certainly true that the existence of PFI credits exacerbated the budgetary incentive to pursue private finance, since similar subsidies were not provided for projects financed by public capital. The PFI credit regime allowed departments and local authorities to gain access to additional capital resources (via private finance) *and* additional revenue resources (via the associated subsidies). However, the removal of PFI credits (which, it should be noted, were only ever in place for PFI projects undertaken by local authorities) is not a comprehensive solution. It remains the case that for non-central government authorities (local authorities, NHS/Foundation Trusts), the incentive to pursue PFI/PF2 is often strong due to constraints on departmental capital budgets (HM Treasury 2013d).

Most of the literature on the budgetary incentives generated by private finance focuses on the *financing decision* (eg Gaffney *et al* 1999, Shaoul 2005, Coulson 2008). However, the lack of a budgetary framework that adequately captures the recurrent expenditures associated with off-balance sheet investments may also give rise to distortions in the *investment decision* (Monteira 2007). Project finance projects typically generate a profile of payments that is not well captured by the short-term appropriation mechanisms that are in place in most countries, the UK included. In a conventional PFI/PF2, public spending on the project is negligible during construction, and the payments are then smoothed over the life of the contract. In this context, even a medium-term expenditure framework, such as the Comprehensive Spending Review in the UK, may be insufficient as these involve a planning horizon of just three-years. This implies that the main decisions on a project finance transaction, including, crucially, whether to sign the contract, are made approximately five years before unitary fees are actually paid. In this context, decision-makers may place undue emphasis on completing the transaction rather than on ensuring, for example, that the project's economic benefits exceed the costs and that unitary fees are sustainable over the whole multi-decade life of the contract.

As part of the PF2 reform, the government intends to introduce what it labels a *control total*—a cap on the proportion of a spending department's expected future annual revenues that can be used to pay the unitary fee on a project. In the Spending Round for 2015/16 (HM Treasury 2012d), it was announced that the control total will include the existing stock of PFI contracts as well as new PF2 contracts signed. The coverage of the control total will include all PFI and PF2 contracts funded by central government. The control total will limit payments under PFI and PF2 contracts in nominal terms in each future Parliament and will be set for the five years from 2015–16 at £70 billion. Treasury officials state that this will likely leave fiscal space for around £1bn of PF2 projects to sign each year (Jarvis 2013). The aim is to create a hard budget constraint that will partially address the incentives the Treasury and other departments face to pursue PF2 for budgetary reasons. It may also stimulate a shift from medium-term to a long-term budget planning horizon and better prioritisation of investments.

The control total could also help to guard against certain distortions in contract design that have been a feature of private finance transactions in the past. For example, a short-term approach to budgeting for private finance contracts has led to such as “over-indexation”, which enables the sponsor to agree to a lower *initial* periodic payment (since extra revenue in later years enables the payment of debt service and the equity return to be back-ended), reducing the fee in the early years. On a transaction in which revenues increase over time at the rate of inflation, a lender's cover ratio can be met within the context of a lower initial unitary fee than would pertain with proportional indexation (Yescombe 2008). Over the period of the contract, the charge remains level in real terms but in later years will be higher in nominal terms than would be the case for non-indexed funding since: (i) the loan is paid more slowly; and (ii) more interest is paid in total. If the control total requires a comprehensive and objective projection of the future costs associated with PF2 projects, including the impact of inflation, it may go some way to addressing these, and similar, controversies relating to the design

of such contracts and the impact of political and managerial short-termism. At the time of writing, there is not sufficient detail in the public domain to assess conclusively whether the reform will achieve this.

5. CONCLUSION

The contractual reforms represented by the rebrand from PFI to PF2, along with the institutional setting in which it operates, can be seen as what the Treasury claims is a “comprehensive overhaul of the way privately financed infrastructure projects and services are structured, procured and operated” (HM Treasury 2013b). Given the status of the UK PFI market as the world’s largest, this overhaul is likely to have a significant international impact. This article has suggested that the short-term impact is likely to be an increase in the cost of capital for projects, for a lower level of risk transfer to the private sector. *A priori*, this raises clear questions about the value for money impact of these reforms. Whether they represent an improvement on previous practice with PFI, which has been the subject of extensive academic criticism, and on conventional procurement, remains unclear. A more conclusive judgement on the merits of the key contractual reforms, in particular the impact of lower gearing and the shift away from bank and to institutional debt, will be possible only after the first contracts are signed. Then, as with PFI, empirical knowledge will be built up through careful analysis of PF2 project case studies and identification of their regularities.

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September 2013

Written Evidence submitted by the National Audit Office

THE PRIVATE FINANCE INITIATIVE AND THE ROLE OF FINANCIAL MODELLING IN VFM ASSESSMENTS

Your Committee asked the National Audit Office to undertake an analysis of the VFM assessment process and model for PFI. The assessment process combines a quantitative and qualitative approach to VFM appraisal. Whilst we have considered the whole process in the course of this work, our review has primarily focused on the use of the financial model (the model) in the VFM assessment process.

The model compared the estimated cost of using PFI with a public sector comparator to help determine which delivery and financing route offered best value for money. I enclose a report on our detailed review which I hope will assist your inquiry into PF2. The model was withdrawn in 2012, although the qualitative assessment is still extant. Nevertheless, the lessons from the use of the model remain relevant since public authorities continue to need to justify their choice of contracting approach for new projects. HM Treasury plans to update its existing value for money guidance to help authorities assess a broader range of contracting models, including PF2.

We set out below our key findings, but there is one overarching point we would like to emphasise. The VFM quantitative tool did not answer what we believe is the key question, namely, whether the benefits of private finance outweigh the additional cost of private finance above government borrowing. The Treasury does not agree this is the correct comparison. The Treasury says that the decision on the overall level of public borrowing is a matter for the Government's fiscal strategy and it is that which frames decisions on overall spending and resulting levels of borrowing. The comparison at the individual project level is made on the basis of the

opportunity cost which is about the alternative use of resources within a fixed spending envelope. The Treasury intends to write to the Committee to set out its approach to the appraisal of public spending decisions in more detail.

Our more detailed findings are:

The model for assessing PFI was consistent with the Green Book but had features which served to advantage PFI in the comparison with conventional procurement. In the model PFI costs were spread evenly over the whole life of the contract as the unitary charge was paid. By contrast, the costs of conventional procurement were concentrated in the early years, rather than being spread over time. While this reflects the cash flows of individual public authorities it does not consider the costs from a whole government perspective since government is able to spread out payments over time if it funds investment through public borrowing. Furthermore the model only reflected the incremental cost of private finance above 6.09% rather than the full additional cost of private finance above government borrowing.

Transparency over the choice of modelling approach: The choice of model matters—our review of the model shows that different approaches can lead to materially different results. It is important that all stakeholders are clear both on what question is being asked and how the chosen model answers it.

The evidence gap on the performance of different models: Despite clear guidance to do so, departments have failed to gather the data on project performance that is needed to underpin the main assumptions in the VFM quantitative tool. As the range of contracting models used by government broadens, the need for evidence of their performance in practice will become even greater.

The tendency for project teams to over-rely on the outputs of models: Financial models can be a useful aid to decision-making, for example to help test the sensitivity of costs under different scenarios. But the Treasury and NAO agree that no model can hope to capture all the features of the real world. And along with the Treasury, we would like to see project teams exercise greater use of judgement to match the needs of their project to the most appropriate contracting model, using models to aid decision-making rather than displace the use of judgement.

Some form of quantitative analysis is essential when deciding whether to use public or private finance for a project. We have highlighted the limitations of the model but we believe that quantitative analysis should still be used when financing decisions are made. Financial modelling helps departments compare ways of doing a project. It also provides evidence for the decision made, which supports accountability to parliament. We would like to see departments and Treasury use improved quantitative analysis to assess the merits of using private finance.

I would be happy to ask my team to provide you with further briefing on the report's findings if that would be helpful.

Amyas C E Morse

SUMMARY

1. This report has been prepared in response to the Treasury Committee's request that the National Audit Office examine the value-for-money (VFM) assessment process and model for the Private Finance Initiative (PFI). In its report on the PFI, the Committee recommended:

“The National Audit Office should perform an independent analysis of the VFM assessment process and model for PFI. It should audit all of the assumptions within the model, and report on whether or not these are reasonable. This test of the VFM assessment model should, where possible, be based on representative and up to date samples of data.”¹

2. The VFM assessment process combines a quantitative and qualitative approach to VFM appraisal at three stages—programme, project and procurement level. It involves a quantitative assessment, supported by a standardised spreadsheet-based model, and a qualitative assessment—a set of questions for the authority to consider at each level of the three-stage process, around the viability, desirability and achievability of the project.

3. The Green Book: Appraisal and Evaluation in Central Government sets out government's investment appraisal methodology.² The Value for Money Assessment Guidance built on these concepts to provide a more detailed methodology and set of tools for applying this general approach to the specifics of PFI transactions.³

4. The VFM quantitative tool (the model) was the financial model used to assess the quantitative value for money of using private finance for government projects. It was a cost-effectiveness analysis which compared the estimated cost of using the PFI with a “public sector comparator” to help determine which delivery and financing route offered the best value for money.

¹ House of Commons Treasury Committee, Private Finance Initiative, Seventeenth Report of Session 2010–2012, HC 1146, July 2011, paragraph 89.

² HM Treasury, The Green Book: Appraisal and Evaluation in Central Government, 2003 (updated July 2011).

³ HM Treasury, Value for Money Assessment Guidance, August 2004 (updated November 2006).

5. The qualitative assessment requires project teams to answer around 50 questions to confirm that the use of PFI is viable, desirable and achievable for their project. Unlike the quantitative assessment, the qualitative assessment does not require a comparison of PFI with a public sector comparator. Rather, the focus of the qualitative assessment is on whether or not PFI would work well for a specific project, given the particular features of PFI.

6. The VFM assessment process, and its component quantitative and qualitative assessment parts were intended to aid decision-making about whether or not to use PFI for a given project. Despite clear guidance from HM Treasury that the quantitative tool should form just part of the overall VFM judgement, the Treasury has acknowledged that all too often the quantitative tool was interpreted in practice as a pass/fail test with insufficient weight given to qualitative judgements.⁴

7. The Treasury withdrew the VFM quantitative tool on 5 December 2012 when Private Finance 2 (PF2) was introduced. At the same time, the Treasury said it would update the existing VFM assessment guidance to reflect a wider choice of contracting options, including PF2, but this extended guidance is still under development. Although the quantitative tool has been withdrawn, the overall VFM assessment guidance, including the qualitative assessment criteria, remains extant and procuring authorities are required to use it alongside the Green Book when appraising public private partnership projects.

8. Public authorities continue to need to justify their choice of contracting approach for projects. Our findings from reviewing the use of the quantitative and qualitative assessments should help authorities to implement the Green Book, and help the Treasury as it updates its VFM assessment guidance to reflect a broader range of contracting models, including PF2.

THE GOVERNMENT'S APPROACH TO THE APPRAISAL OF SPENDING DECISIONS

9. The Treasury has asked us to include the following text (paragraphs 10 to 14) to make clear its approach to the appraisal of spending decisions.

10. "The government's approach to appraisal is set out in the Green Book. This provides a common, standard method for comparing all public spending decisions that use central government funding; the approach to appraising potential PFI projects is consistent with this central guidance. The opportunity cost of alternative spending is the government's approach to measuring the public value of all spending proposals. At the individual project level the appraisal informs individual spending decisions and applies only to decisions about resource allocation within a predetermined budget; the decisions are on whether to spend, or not, on a particular proposal."

11. "The calculations are not intended to inform a decision on the sale of government debt or the raising of taxation because the fiscal envelope is fixed. These are macroeconomic decisions and the need for sale of government debt is determined by factors which lie outside of the immediate spending decision that the appraisal seeks to inform. The opportunity cost of an individual spending proposal is thus simply the value of alternative spending projects."

12. "In addition, the standard approach uses a single, common discount rate—the social time preference rate. This is used simply as a means to adjust alternative options with different patterns of future costs and benefits to allow for social time preference and so facilitating their comparison. The discount rate used attempts to reflect pure preferences for benefit now over benefits postponed until the future, an element of unidentified background risk. Project specific risk is as far as possible built into the costs of the proposal and so for this reason is excluded from the discount rate."

13. "For these reasons the Treasury does not agree with the reworked modelling that the NAO has undertaken on the sample projects to reflect in the conventionally funded and delivered comparator a cost of government borrowing, the rescheduling of payments to reflect the timing of payments under a PFI arrangement or alternative discount rates."

14. "The Treasury intends to write to the Committee to set out its approach to the appraisal of public spending decisions in more detail."

OUR APPROACH

15. Our analysis focused on the use of the VFM assessment process for six projects approved in 2010. Five of the six project teams chose to use PFI, and those five represent half of the PFI projects approved in 2010.

16. Our review has been carried out to draw conclusions on the VFM assessment process for PFI and should not be interpreted as drawing conclusions about the value for money of the individual projects we have examined. Our main focus has been the cost-effectiveness analysis carried out to assess the value for money of PFI. We do not draw conclusions on HM Treasury's overall approach to investment appraisal. This review has primarily focused on the use of the model but we also comment briefly on the qualitative assessment (paragraphs 3.45 to 3.49).

⁴ HM Treasury, A new approach to public private partnerships, December 2012.

 KEY FINDINGS ON THE FINANCIAL MODEL

17. Quantitative analysis plays an important role in government's investment decisions and the approaches set out in the Green Book help government departments to do this. The Green Book sets out government's appraisal methodology which is used by departments to make investment decisions. The analysis helps departments answer important questions about the relative costs and benefits of different options (paragraphs 3.7 and 3.8).

18. The cost-effectiveness analysis performed for PFI projects, which was consistent with the Green Book, did not evaluate the value for money of PFI compared to government borrowing. The PFI assessment process assumed the government has already set its expected levels of government borrowing and agreed spending limits for individual procuring authorities as part of the spending review and annual budgeting process. The Treasury's model did not reflect the cost of government borrowing when judging the value for money of individual PFI projects. Instead, the assessment process indicated whether PFI offered better value for money than using an authority's existing budget allocation to pay for the project, taking into account the benefits of private finance. This approach had two implications—both of which favoured the use of PFI:

- *The model reflected the advantage to public authorities that PFI brings of allowing them to spread the costs over time.* The model set out the timing of PFI cash flows on a financing basis (reflecting the payment schedule when unitary charges are due to be paid). By contrast, the model reflected the cash flows for conventional procurement when construction activity was paid for, which tends to be early in a project's life. Individual public authorities cannot spread out payments over time in the same way the government can do if it funds investment through public borrowing. This spreading out of PFI payments, but front-loading of conventional procurement costs, meant the present value cost of construction under PFI was reduced relative to that of conventional procurement (paragraphs 3.12 and 3.13).
- *The model only measures the cost of private finance above the social time preference rate.* Consistent with HM Treasury's guidance set out in the Green Book, the model used the social time preference rate⁵ as its discount rate rather than the government's current cost of borrowing. Since 2003, the social time preference rate has been fixed at 3.5% real, which is 6.09% with inflation. Because the PFI costs were spread over time, the application of this discount rate meant that it cancelled out the financing costs that were below an effective interest rate of 6.09% (paragraphs 3.14 to 3.16).

19. To assess whether it would be cheaper to use government borrowing rather than PFI on individual projects would require structural change to the model. We reworked six instances of the model using a) the rate of government borrowing, and b) the repayment profile of government borrowing, while keeping all other assumptions the same. Using either approach, PFI came out looking more expensive than conventional procurement for five of the six projects we examined. The Treasury does not agree with the methodology of these approaches and says that including the cost of government borrowing is inconsistent with the Green Book (paragraphs 3.17 to 3.22).

20. More accurate models, known as "shadow bid models", are used by teams for other purposes and generate significantly higher estimates of the cost of PFI than the VFM quantitative tool. Shadow bid models are generally prepared by a project team's advisers on the same sort of basis as bidders prepare their own bids. Project teams told us that they found shadow bid models very useful in helping them understand their project and assess and challenge bids. Shadow bid models produced higher estimates for the cost of PFI in the three cases we examined where a shadow bid model was available, and these differences were due to the method of calculation rather than variances in the inputs (paragraphs 3.24 to 3.26).

21. *Key assumptions in the model were not supported by empirical evidence.* The post full business case optimism bias adjustment had a significant impact on the output of the model and its value should have been derived from historic data about project performance to time and cost. (HM Treasury published guidance in 2004 requiring departments to collect evidence to support key assumptions in the model, including optimism bias).⁶ In the absence of data on the delivery to cost and time of non-PFI projects, project teams resorted to estimating the likelihood that costs would rise above initial estimates and used this as a proxy for the optimism bias adjustment. As such, the adjustment was highly dependent on the expertise and judgement of each project team and its advisers, and is difficult to substantiate or scrutinise. Other assumptions in the model relating to tax and flexibility also lacked an empirical basis (paragraphs 3.30 to 3.38).

22. *The Treasury's guidance on assessing PFI has evolved as PFI itself has developed.* The history of the VFM assessment process shows that the Treasury recognises the risks inherent in asking project teams to create bespoke models for projects that they wish to see proceed. The Treasury has also been very clear that the models should not be a "pass or fail" test, and has regularly updated its guidance to emphasise this point to procuring teams. And it has been willing to review its approach, most notably in 2010 when it suspended the use of PFI for new projects while it undertook a review of the value for money of PFI (paragraphs 1.1 to 1.7).

23. Quantitative analysis is an essential part of decision-making, but project teams over-relied on the model in their decision-making. The introduction of the model did away with the need for expensive, bespoke models

⁵ The social time preference rate is a tool of economic analysis that reflects social attitudes to spending now as opposed to the future.

⁶ See footnote 3.

for each project. The financial model helped teams to better understand project needs, risks, costs and sensitivities. However, like any financial model, it could not capture all the features of a real-world decision. It was based on simplifying assumptions which can be highly subjective and often lack an empirical basis (such as the optimism bias adjustment) and so should not have been relied upon to provide a conclusive answer. However, despite Treasury guidance that the model should not be a “pass or fail” test, many project teams did not provide sufficient explanation of the underlying rationale for their choice of contracting approach (paragraphs 3.39 to 3.44).

FINDING ON THE QUALITATIVE ASSESSMENT

24 The qualitative assessment provides a useful checklist to help project teams consider whether PFI will meet the intended outcomes of the project and is a suitable delivery methodology. The qualitative assessment, unlike the quantitative assessment, does not require project teams to compare PFI to a public sector comparator. All the questions in the qualitative assessment are focused on whether or not PFI will work well for a given project rather than assessing whether it offers the best value for money in comparison to other approaches (paragraphs 3.45 to 3.49).

PART ONE

History of the VFM assessment process

1.1 The VFM assessment process has developed over a number of years to guide procuring authorities in their assessment of whether or not private finance offered better value for money for their project than “conventional procurement”.

1.2 Prior to 2004, procuring authorities used *The Green Book: Appraisal and Evaluation in Central Government*⁷ and Treasury Taskforce Technical Note 5⁸ to conduct their appraisal of projects. While there have been changes in appraisal guidance over time, the overall basis of the quantitative assessment has always been the same: a present value, risk-adjusted, discounted cash flow analysis of the cost of a privately financed public private partnership compared to a conventionally financed and delivered alternative.

1.3 In 2004, the Value for Money Assessment Guidance was published, replacing the Treasury Taskforce Technical Note 5.⁹ The need for new guidance had arisen due to changes in the government’s approach to investment appraisal set out in the revised Green Book (April 2003) and the reforms to investment appraisal for PFI set out in *PFI: Meeting the Investment Challenge* (July 2003).¹⁰ The revised Green Book set out a broad methodology for investment appraisal. The VFM assessment guidance built on these concepts to provide a more detailed methodology and a set of tools for applying this general approach to the specifics of PFI transactions.

1.4 The VFM assessment process, in place since 2004, appraises PFI projects through a combination of quantitative and qualitative analysis, and is based on a three-stage approach—for programme, project and procurement level assessments. There are two elements to inform the decision-making process: the quantitative assessment, supported by a standardised financial model (“the model”), and a qualitative assessment—a set of questions for the authority to consider at each level of the three-stage process, around the viability, desirability and achievability of the project. In its 2004 guidance, HM Treasury stressed that the model should not be a “pass or fail” test and that the qualitative case should also be considered when determining whether or not to use PFI.¹¹ In March 2007, HM Treasury updated the guidance to further emphasise the importance of the qualitative assessment alongside the model.

1.5 Also in 2004, HM Treasury introduced, for the first time, a standardised VFM quantitative tool which was a spreadsheet-based model. This was partly in response to National Audit Office and Committee of Public Accounts criticisms of the complex and expensive bespoke models previously used to compare the cost of PFI to conventional procurement. HM Treasury acknowledged the need for a quantitative-based assessment but also recognised the inherent limitations of modelling, and sought to develop a model that was simple, practical and easy to use. HM Treasury’s overall objectives for the standardised model were to:

- ensure a simple approach reflecting the early point at which the analysis took place;
- focus authorities’ minds on the underlying assumptions and the interplay with qualitative judgement, and move the analysis away from a single pass/fail point estimate;
- reduce costs and ensure ownership of decisions lay with the authority and not their advisers; and
- introduce consistency across the public sector and improve the underlying evidence base.

The VFM quantitative tool was unique to PFI; government does not currently have any similar standard model for comparing contractual approaches.

⁷ HM Treasury, *The Green Book: Appraisal and Evaluation in Central Government*, 2003 (updated July 2011).

⁸ Treasury Taskforce Technical Note 5, *How to construct a public sector comparator*, 1999.

⁹ HM Treasury, *Value for Money Assessment Guidance*, August 2004 (updated November 2006).

¹⁰ HM Treasury, *PFI: meeting the investment challenge*, July 2003.

¹¹ See footnote 9.

1.6 On 5 December 2012, when Private Finance 2 (PF2) was introduced, the Treasury withdrew the VFM quantitative tool. At the same time, the Treasury said it would update the existing VFM assessment guidance to cover a wider choice of contracting options, including PF2, but this extended guidance is still under development. Although the quantitative model has been withdrawn, the qualitative assessment remains extant.

NOTE ON MOST RECENT PFI PROJECTS

1.7 The most recent PFI projects to use the VFM assessment process were those approved in 2010. In our July 2010 report on financing PFI projects in the credit crisis, we noted that the cost of private finance has risen considerably relative to the cost of public borrowing since the start of the financial crisis in 2008.¹² We concluded that, up to the end of 2009, the extra finance costs of the projects financed were value for money. We took this view because the overarching policy priority to provide economic stimulus severely limited the scope for the Treasury to do more than they did to protect public value, while ensuring that the programme of PFI projects was moved forward. However, we also noted that for later projects PFI was less likely to be value for money unless there were substantial and credible savings to offset higher financing costs. The projects we looked at for this current report were approved between 2009 and June 2010. The Treasury did re-review the value for money of these projects in the second half of 2010, but it did so without reference to the differential between the cost of private finance and government borrowing.

PART TWO

Overview of the model

2.1 The VFM quantitative tool was a spreadsheet into which a number of assumptions about the costs and timings of cash flows of both a PFI and conventional procurement approach were input. Figure 1 lists some of the key inputs for both approaches. The tool supported a cost-effectiveness analysis in which costs were discounted to produce an estimate of the difference in cost between doing the project using PFI and doing it using “conventional procurement” (the public sector comparator). This was expressed as the difference in present value¹³ of the whole life cost of the project.

2.2 To make this calculation, the model compared the cash flows of the unitary charge (the payment to the contractor under PFI) and the resource costs of the public sector comparator.¹⁴ An illustration of the typical cash flows in the model is set out in Figure 2 on page 16. The model spread the capital cost of the PFI option over time whereas the public sector comparator’s capital costs were frontloaded. The “optimism bias adjustment”¹⁵ increased the costs of the public sector comparator to take account of the tendency for costs and time to be underestimated in conventionally-funded projects.

2.3 Figure 3 illustrates the components of the model. The most important variables in determining the output of the model were generally the optimism bias adjustment and those variables affecting the estimate of the cost of private finance.¹⁶

¹² National Audit Office, Financing PFI projects in the credit crisis and the Treasury’s response, HC 287, 2010–11, July 2010.

¹³ Present value is the current worth of a future sum of money or stream of cash flows given a specific rate of return.

¹⁴ The resource costs include construction, lifecycle, maintenance and operating costs.

¹⁵ Specifically, the ‘post-full business case optimism bias’.

¹⁶ Such as the swap rate and the margin on the swap rate.

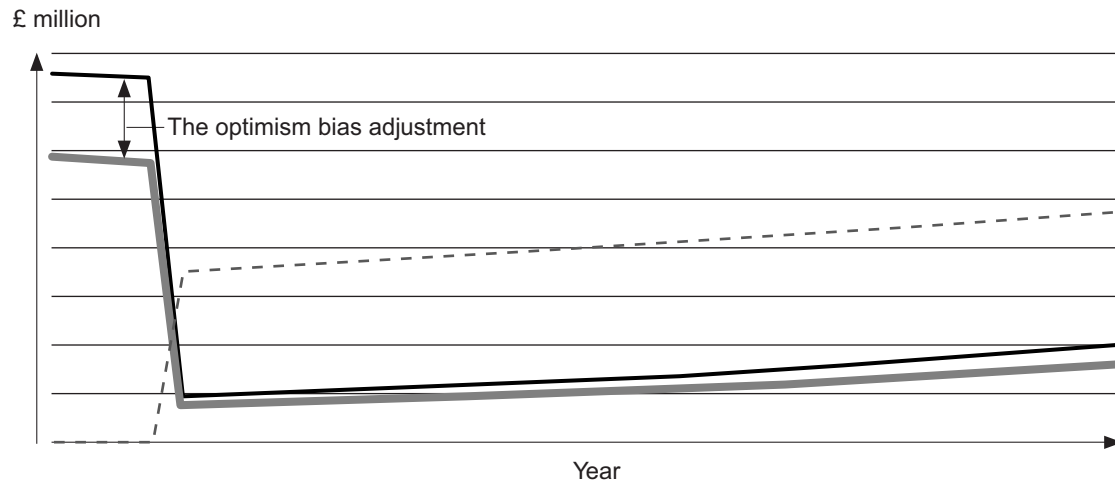
Figure 1**KEY INPUTS WITHIN THE MODEL**

Area	Public sector comparator (PSC)	Private Finance Initiative (PFI)
Initial capital cost of construction	Charged when incurred – usually in early years of the project.	Included in the annual unitary charge paid to the contractor, and thereby spread over the whole life of the contract.
Cost of maintaining the asset over the life of the contract	Charged when incurred.	Included in the annual unitary charge paid to the contractor, and thereby spread over the whole life of the contract.
Cost of operating the asset		
Cost of finance and time value for money	Actual cost of public debt not reflected. All costs discounted at the social time preference rate.	Cost of finance included in the annual unitary charge paid to the contractor. However, because all costs were discounted at the social time preference rate, only financing costs above 6.09 per cent were recognised.
Optimism bias (risk of increases in cost up to contract signature)	Included.	Included.
Optimism bias (risk of increases after the contract is signed)	An estimate was added to represent the tendency of public sector contracts to overrun in time and cost.	Not included as the PFI cost is fixed by this point.
Tax charge	An estimate was added to reflect the tax that would be charged on the PFI option. It was added to the PSC rather than the PFI option in order to allow the PFI option to be compared to actual bids as they were received.	
Public sector transaction costs	Same value for both options.	
Flexibility charge	Some projects included an estimate for the likelihood that contractual changes would be required mid-contract. This was included in both options but the adjustment to the PFI option was usually higher than the adjustment to the PSC to reflect the premium the contractor would charge to make the change.	
Residual costs	If the maintenance and lifecycle costs of the public sector comparator were lower than those of the PFI option, then residual repair costs were added to the PSC to reflect the cost of bringing the asset up to the PFI standard of repair at the end of the project.	

Source: National Audit Office analysis of the VFM quantitative tool

Figure 2

ILLUSTRATIVE CASH FLOWS IN THE MODEL



— Public sector comparator including optimism bias

— Public sector comparator resource cost

- - - PFI unitary charge

Note

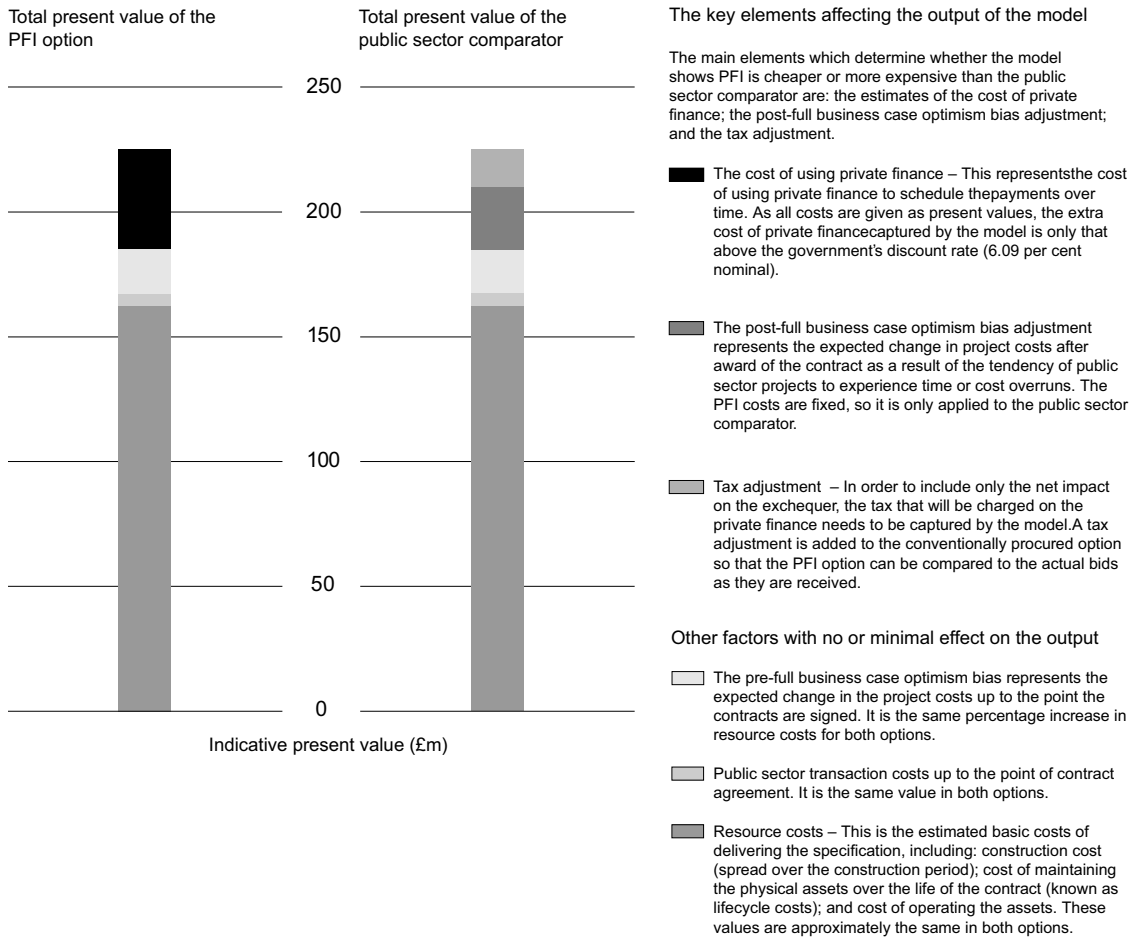
1 These illustrative cash flows show how the PFI payments are spread over time, compared to the resource costs of the public sector comparator which is increased by the optimism bias adjustment

Source: National Audit Office analysis of the VFM quantitative tool

Figure 3

KEY COMPONENTS OF THE VFM QUANTITATIVE TOOL

Components of the PFI option and public sector comparator



Notes

- 1 Additional factors not reflected above are the flexibility allowance and the residual value (see paragraphs 3.36 to 3.38). These factors are not included in every instance of the model. The flexibility allowance is optional and the residual value adjustment is only used if the maintenance and lifecycle costs of the public sector comparator are lower than the PFI option.
- 2 The values in this figure are purely illustrative.

Source: National Audit Office

PART THREE

Findings from our review of the model

3.1 We looked at the use of the model in six projects approved in 2010. Five of the six project teams chose to use PFI, and those five represent half of the PFI projects approved in 2010.¹⁷

3.2 We reviewed the use of the model for all six projects to understand the different components of the model and how they interacted. We also considered the evidential basis for some of the key assumptions used in the model. We produced three variants of the VFM quantitative tool to demonstrate how the outputs change if the comparison between PFI and the public sector comparator were modelled differently. We also reviewed the use of the qualitative assessment for the five PFI projects in our sample.

3.3 The outputs of the model for two of the six projects showed PFI to be more expensive than the public sector comparator. One of these projects used the result of the model as part of its justification for using an alternative to PFI. The business case for the other project noted that revenue was expected to be created by the public private partnership arrangements. The model was not designed to capture revenue, so in this case the project team felt that the result of the model did not fully reflect the benefits of using PFI. The team concluded

¹⁷ All projects were reviewed by the procuring authority, sponsor department and HM Treasury (three of the six projects were local authority delivered, PFI credit funded projects which were reviewed by the Treasury-chaired cross-Whitehall Project Review Group). As these projects were approved in 2010 they were subject to two reviews by HM Treasury as the incoming government asked for all large projects to be re-reviewed.

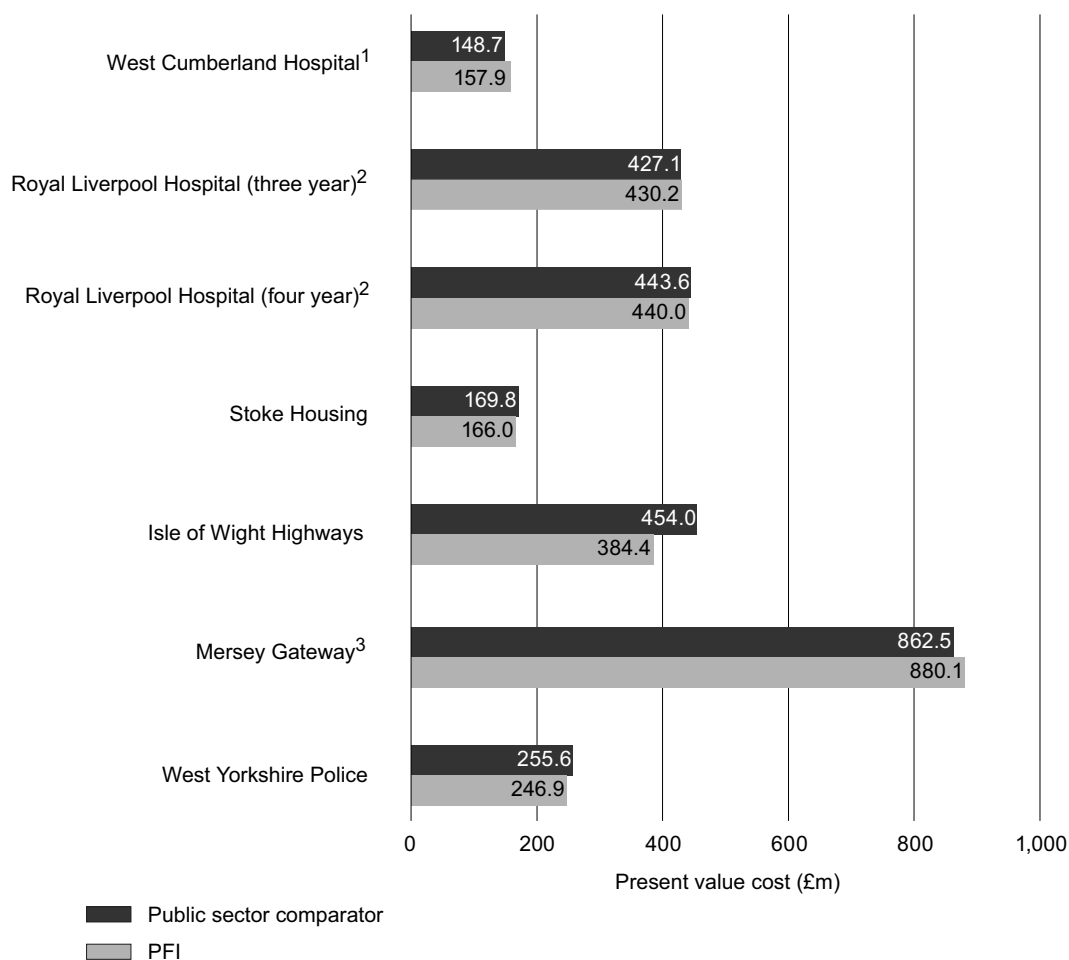
in the business case, that the income from the project made up for the small net cost of using PFI shown by the model.

THE OUTPUT OF THE MODEL CAN BE VERY MARGINAL

3.4 In all but one of the six cases we looked at, the result of the model was a marginal difference between PFI and the public sector comparator (Figure 4). In cases such as these, small changes in the input variables can change the overall conclusion of the model (that is, which option the model indicates is cheaper).

Figure 4

THE RESULTS OF THE VFM QUANTITATIVE TOOL, SHOWING THE PRESENT VALUE COST OF PFI AND THE PUBLIC SECTOR COMPARATOR FOR SIX PROJECTS



Notes

- 1 This project chose not to use PFI.
- 2 This project forecast a construction period of three and a half years. It used the average result of three and four year construction period models. It is the most marginal of the cases here.
- 3 This project used PFI because the authority considered there to be an additional benefit to net from the cost of the PFI option.

Source: National Audit Office analysis of the VFM quantitative models

3.5 For this reason the Treasury guidance required authorities to test the results of their model using indifference points to see how changes in the inputs to the model affected the outcome, as well as considering the outcome of the qualitative assessment before deciding which route offered best value for money. The models we reviewed used this sensitivity analysis to consider the impact of movements in variables such as the operational expenditure and the cost of private finance. It is difficult to see what impact this had on the decision given that none of the project teams changed their procurement approach following the analysis.

THE MODEL DOES NOT COMPARE PFI WITH FINANCING THROUGH GOVERNMENT BORROWING

3.6 The 2011 Treasury Committee³ report on PFI concluded that the merits of using private finance should be assessed by considering whether the benefits of using private finance outweigh the additional cost of private

finance above government borrowing.¹⁸ This is similar to the approach that the National Audit Office set out in its summary report on private finance projects to the House of Lords Economic Affairs Committee in 2009.¹⁹ However, the HM Treasury VFM assessment process for PFI projects did not enable the cost of private finance to be compared to that of government borrowing.

3.7 HM Treasury's approach to the VFM assessment of PFI (and hence the construction of the model) is consistent with The Green Book.²⁰ The Green Book sets out HM Treasury's common methodology for comparing all public spending decisions. The approach uses the opportunity cost of alternative spending as the yardstick for measuring the public value of all spending proposals.

3.8 The Treasury chose this yardstick because of the broader context of spending decisions. Individual organisations, such as central government departments, NHS trusts or local authorities, cannot influence the level of government borrowing. Therefore, the Treasury believes the relevant issue for departments when deciding how to do a particular project is not whether borrowing money or using private finance offers better value for carrying out their project. Rather, the decision departments have to make is about whether using some of their allocated budget on the project is better or worse value than using private finance for the project.

3.9 Therefore, under the Green Book approach, government borrowing costs or the cost of raising taxation do not feature in project appraisal, because the fiscal envelope is fixed. Individual project appraisals focus on decisions about resource allocation within the authority's pre-determined budget—that is, whether or not to spend the authority's allocation of capital expenditure on a particular proposal or to use private finance and pay the unitary charge using its resource expenditure. The Treasury's logic is explained further in Figure 5.

Figure 5

HM TREASURY'S LOGIC FOR KEY FEATURES OF THE MODEL FOR ACCESSING THE VFM OF PFI

- 1 Overall approach: The model was a cost-effectiveness analysis and not a full economic model. The model assumed that both the PFI and public sector comparator would lead to the same outcomes and social welfare, and that it was reasonable therefore to focus solely on the different cost to the exchequer of the two routes. Because the model excluded social welfare effects it was not necessary to measure when the asset was built or maintained, but only when payments were made.
- 2 The comparison: The decision about how much the government should borrow is a decision for the Treasury rather than departments. And procuring authorities' budgets are set during the spending review process. Therefore, procuring authorities do not need to consider the cost of government borrowing when deciding how to procure a project – they just need to decide whether it is better value for money to use their existing funding or PFI for their project. The model was designed to help with this comparison – it helped procuring authorities compare the cost of using PFI to the cost of using their existing budget allocation to finance a project, taking into account the benefits of private finance. The cost of government borrowing did not feature in the model.
- 3 No alternative sources of finance: The model assumed that the procuring authority would not use any other financing arrangement under the public sector comparator, such as prudential borrowing. The payments under PFI, including the financing arrangements, were compared to the payments under the public sector comparator with no financing. The net cost to the procuring authority of using PFI within existing budgets could therefore be measured by comparing the two schedules of payments.
- 4 Capturing tax receipts: The net cost to the procuring authority needed to be converted to the net cost to the exchequer by capturing any difference in tax receipts.

Source: Conversations with HM Treasury officials

3.10 While we recognise the logic of these arguments, we are concerned that these points have not been widely communicated. As a result, the modelling process is widely thought to answer the question “Is private finance better value for money than conventional procurement financed by government borrowing?”, which in fact it does not. The model actually helped procuring authorities compare the cost of PFI with using their existing budget allocation to finance a project—a useful but altogether different comparison.

3.11 Adopting this approach to comparing PFI with the public sector comparator, had two impacts on the model, both of which favour the use of PFI:

- The costs of private finance were spread over time but most of the cost of conventional procurement was not (paragraphs 3.6 and 3.7).
- The model used a discount rate which was higher than the cost of government borrowing and this had the impact of overstating the cost of conventional procurement (paragraphs 3.8 to 3.10).

¹⁸ House of Commons Treasury Committee, Private Finance Initiative, Seventeenth Report of Session 2010–2012, HC 1146, July 2011.

¹⁹ National Audit Office, Private finance projects: a paper for the House of Lords Economic Affairs Committee, October 2009.

²⁰ HM Treasury, The Green Book: Appraisal and Evaluation in Central Government, 2003 (updated July 2011).

The model spread the cost of PFI over time but did not spread the cost of the public sector comparator

3.12 The model reflected when cash payments would be made by the public authority in question. This meant that the PFI cash flows reflected the payment schedule of unitary charges that were due to be paid by the public authority to the contractor, while the payments for the conventional procurement route were concentrated in the early years of the contract. As a result, the present value cost of construction under PFI was significantly reduced relative to that of conventional procurement in the model.

3.13 While this modelling reflects the cash flow position of the public authority it does not consider the position of the government as a whole. If the government had chosen to borrow to fund the capital investment it would have been able to spread out the costs of the conventional procurement over time, just as PFI payments are spread over time. But the Treasury's model approached decision-making from the authority's perspective rather than the overall exchequer perspective, and so did not reflect the cost of government borrowing or the cost of raising taxation. The Treasury's approach is in line with the Green Book, which appraises projects at an individual project level rather than capturing cash flows for the government as a whole.

Difference between the model's discount rate and the rate of government borrowing

3.14 Since the Treasury believes departments do not need to take into account the government's actual cost of borrowing, the model used the social time preference rate²¹ rather than the cost of government borrowing as the rate for discounting the estimated cost of the PFI and conventional options back to their comparable present values.²²

3.15 The value of the social time preference rate, as set out in the Green Book, has been 3.5% real (6.09% nominal) since 2003. The application of this discount rate to the PFI costs that were spread over time meant that the additional cost of private finance in the model was only measured to the extent that its implicit interest rate was above 6.09%.

3.16 The cost of public borrowing has been below 6.09% for over a decade and has fallen significantly since the financial crisis—in 2012–13 the average cost of public borrowing was 2.09%.²³ Because the model both charged the majority of the conventional procurement costs upfront and used the standard discount rate that is well above the cost of public borrowing, the model understated the additional cost of using private finance compared to government borrowing.

Alternative ways to model the comparison

3.17 Setting aside departmental budget allocations and decisions about the overall level of government borrowing, it seems reasonable that any decision about whether to use PFI for a given project ought to consider whether PFI is the cheapest way to the exchequer of doing that project.

3.18 To assess whether PFI or government borrowing is cheaper would require a different way of modelling the comparison between PFI and the public sector comparator.

3.19 In the US, the Office for Budgetary Management (part of The White House) requires US public bodies to use a discount rate of 7% real in most cost–benefit analysis. Seven% is used as an approximation of the pre-tax rate of return on investment in the private sector and is intended to reflect the opportunity cost of the project. However, for lease arrangements and cost-effectiveness analysis (that is, analysis similar to that which the UK undertakes for PFI projects), the Office for Budgetary Management requires US public bodies to use its forecast nominal market interest rates (that is, the cost of government borrowing) as the discount rate.²⁴ These rates are currently between -1.4 and +1.1% real, depending on the term of the project.²⁵ This modified approach is used for cost-effectiveness analysis because the benefits of different options are assumed to be the same and it is only the amount and timing of payments that require modelling. Using the government's cost of borrowing ensures that the model assesses which option would be the cheapest to the US taxpayer.

3.20 We reworked HM Treasury's model using two alternative approaches to compare private finance with government borrowing (see paragraphs 3.21 and 3.22). Both approaches indicated that PFI was more expensive than using public borrowing for the projects we assessed. HM Treasury does not agree with these modelling approaches because it says they are inconsistent with the government's overall approach to investment appraisal as set out in the Green Book (see Figure 5).

²¹ The social time preference rate reflects social attitudes to spending now as opposed to the future. It is an accepted method for appraising investments since it provides a standard rate that takes into account the cost of both public borrowing and taxation. HM Treasury's Green Book explains why the government uses 3.5 per cent real (6.09 per cent nominal) for the social time preference rate. The rate is based on a number of variables which are inherently uncertain, so the value is an approximation. The rate is changed relatively infrequently.

²² Present value: the current worth of a future sum of money or stream of cash flows given a specific rate of return.

²³ UK Debt Management Office, DMO Annual Review 2012–13, August 2013, p. 49, Table B1

²⁴ OMB Circular A-94, Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs, Office of Management and Budget, 29 October 1992.

²⁵ M-13–04, 2013 Discount Rates for OMB Circular No. A-94, Office of Management and Budget, 24 January 2013.

Remodelling based on the rate of government borrowing

3.21 One way to rework the model to take account of government borrowing is to use the government's cost of borrowing as the discount rate (rather than the social time preference rate).²⁶ We reworked all six instances of the model we looked at using a discount rate²⁷ of 4.5%, which is close to the 25-year gilt rate at the time the models were produced. Taking this approach we found that, keeping all the other assumptions the same, five of the six models that had previously shown PFI was cheaper changed to indicate that PFI was more expensive than the public sector comparator—in some cases this was by a substantial amount (orange bars in Figure 6). The Treasury does not agree with the methodology of this approach, pointing out it is not consistent with the Green Book.

Remodelling based on government borrowing cash flows

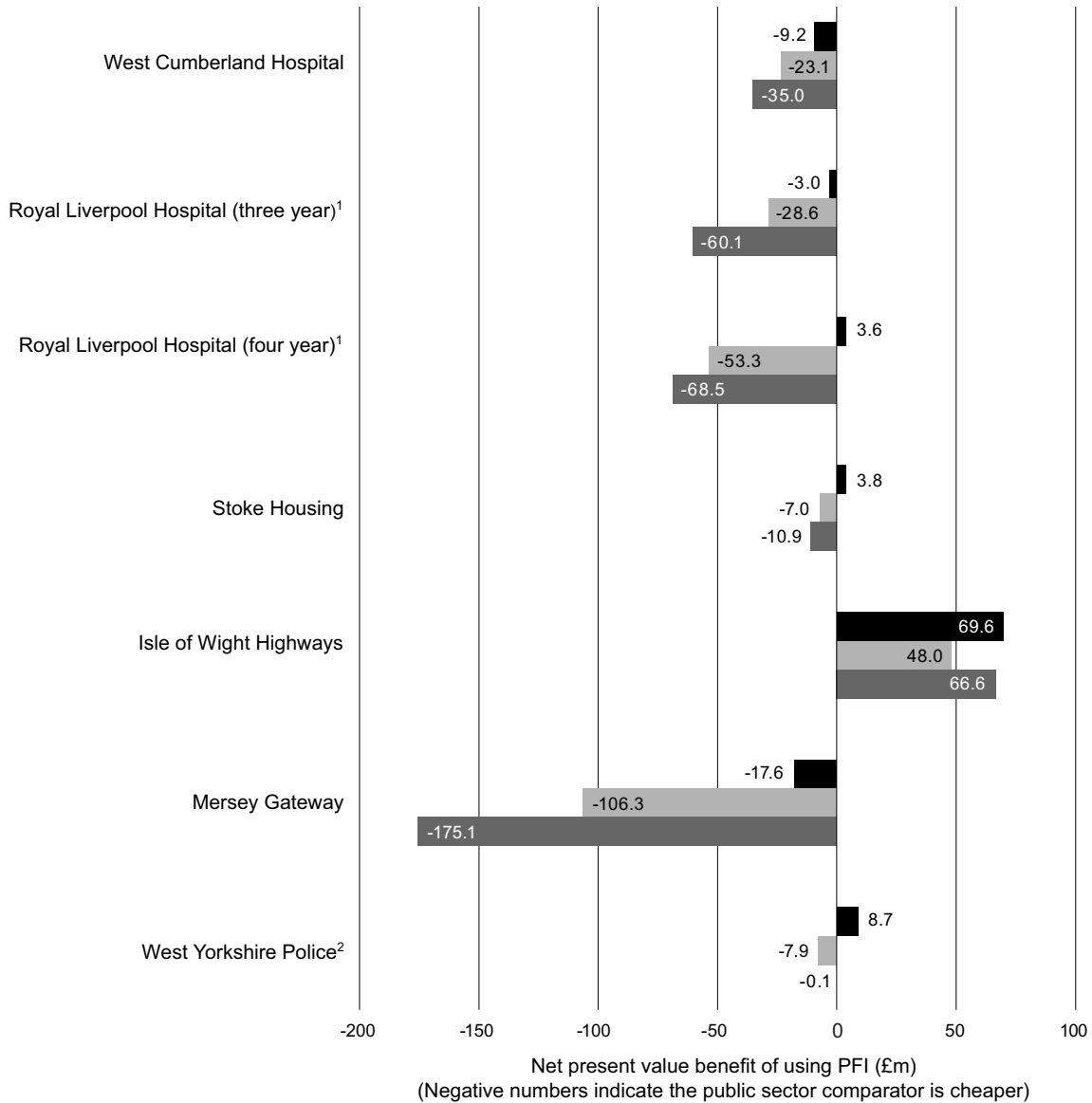
3.22 We also reworked the model so the public sector comparator cash flows were spread over time as they would be if they were financed by government borrowing. We discounted costs at 6.09% nominal to maintain comparability with other investment appraisals prepared under the Green Book. Just as before, and keeping all other assumptions the same, we found that the same five models (of the six we looked at) which had previously shown PFI was cheaper changed to indicate that PFI was more expensive than the public sector comparator (yellow bars in Figure 6). Although we believe this to be compatible with the Green Book, the Treasury does not agree with the methodology of this approach for the reasons outlined above (paragraphs 3.7 to 3.9 and Figure 5).

²⁶ This social time preference rate is a measure of social attitudes to spending now rather than in the future (see paragraphs 23 and 24).

²⁷ Discount rate: the percentage rate applied to cash flows to enable comparisons to be made between payments made at different times. The rate quantifies the extent to which a sum of money is worth more to the government today than the same amount in a year's time.

Figure 6

RESULTS OF THE MODEL AFTER REWORKING IT TO ACCOUNT FOR THE COST AND PROFILE OF GOVERNMENT BORROWING



- VFM quantitative tool
- Using a public sector comparator with borrowing
- Using a discount rate of 4.5 per cent

Notes

- 1 This project forecast a construction period of three and a half years. It used the average result of three- and four-year construction period models.
- 2 No orange bar shows because the value is a very small negative value, not visible on this graph.

Source: National Audit Office modelling

3.23 While the two methods set out above give an indication of whether or not PFI is cheaper than using government borrowing, the comparisons are on a financial basis so neither method takes into account social attitudes to spending now as opposed to the future. To make a comparison on an economic basis (so as to reflect social attitudes to spending) would require the private finance cash flows to be modelled on an economic basis. This would be highly technically challenging.

SHADOW BID MODELS

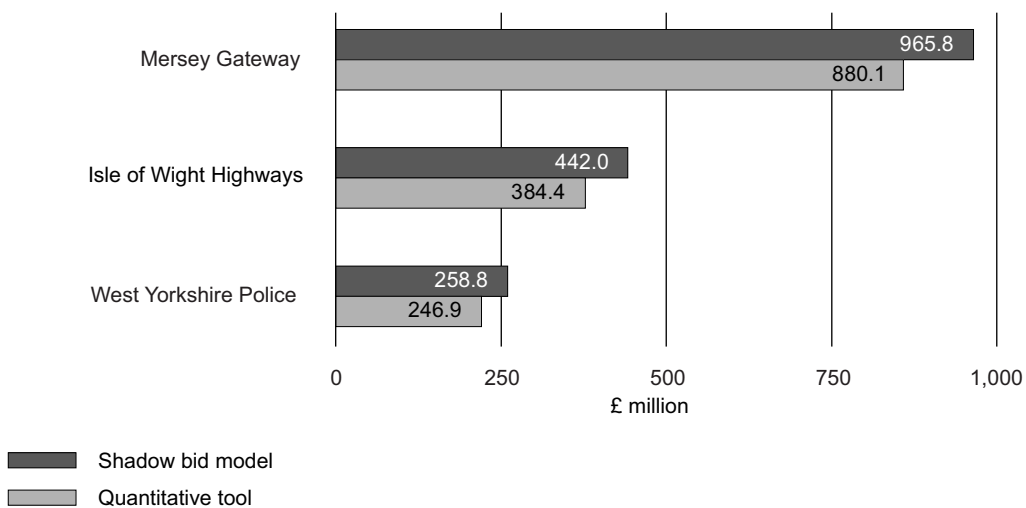
3.24 The model used a simplified calculation of the cost of private finance which excludes some costs associated with using PFI.²⁸ Alongside the Treasury model, project teams tended to commission their advisers to produce another more detailed financial model—known as the “shadow bid model”—which was based on standard templates similar to those used by contractors to price their bids. Shadow bid models were more complex than the VFM quantitative model and included additional costs that the quantitative model excluded. The shadow bid model therefore gave a more sophisticated estimate of the expected PFI unitary charge and teams used it to help them assess the affordability of their project and the reasonableness of contractors’ bids.

3.25 Shadow bid models were available for three of the five PFI projects we examined. In all three shadow bid models: a) the estimated cost of private finance was greater, and b) the estimated corporation tax was lower²⁹ than the comparable estimates in the VFM quantitative tool (see Figure 7 and Figure 8). These differences arise from the different calculation methods used in the VFM quantitative model and the shadow bid model, and not from different input values.

3.26 Treasury guidance required project teams to reconcile differences where they emerged from the use of a shadow bid model. However, we saw no evidence that teams had reconciled the differences in the cost of PFI under the quantitative tool model and the shadow bid model. And we conclude that department and Treasury reviewers did not challenge this failure to comply with the guidance since the business cases we looked at were approved by the department and the Treasury without such reconciliations being done.

Figure 7

COMPARISON OF THE ESTIMATED PRESENT VALUE OF PAYMENTS UNDER PFI



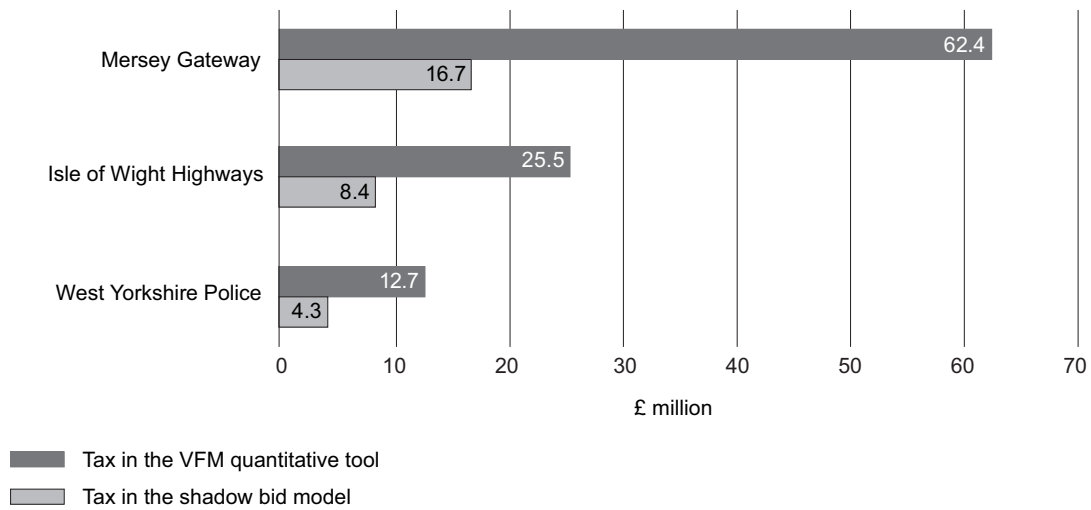
Source: National Audit Office analysis

²⁸ For example, it excludes equity bridges, quarterly payments and reserve accounts.

²⁹ Because of the way the VFM quantitative model deals with tax, a lower corporation tax value makes the PFI option more expensive relative to the public sector comparator (see paragraph 3.19).

Figure 8

COMPARISON OF PRESENT VALUE OF CORPORATION TAX ADJUSTMENTS IN THE VFM QUANTITATIVE TOOL AND THE SHADOW BID MODEL



Source: National Audit Office analysis

REWORKING THE MODEL USING SHADOW BID FIGURES FOR THE COST OF PFI AND TAX

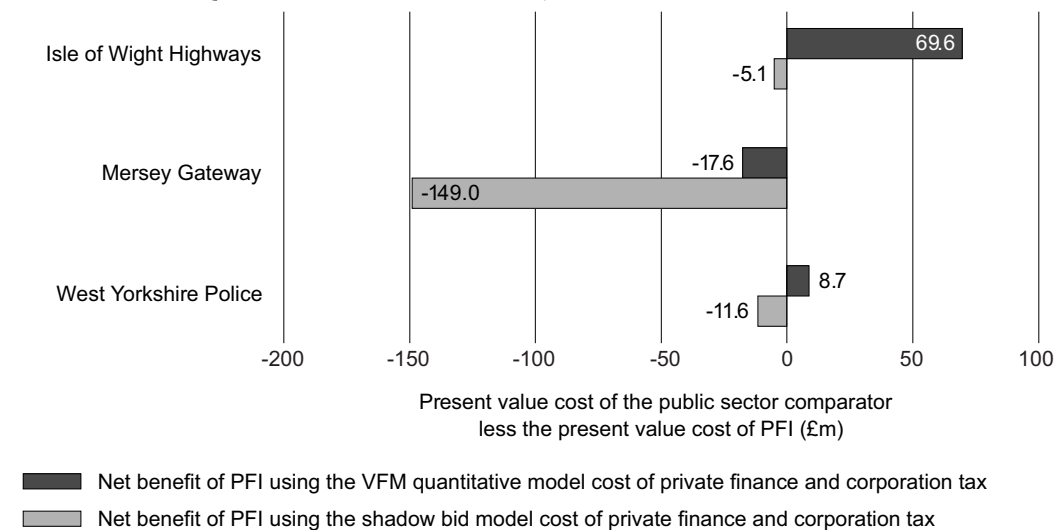
3.27 When we reworked the VFM quantitative tool using the more accurate estimates of the cost of private finance and corporation tax taken from the shadow bid models, we found that, of the three projects examined, the two that had previously shown PFI was cheaper changed to indicate it was more expensive. The one that had shown the public sector comparator to be cheaper originally showed it to be cheaper by an increased margin (figure 9).

THE CHOICE OF MODELLING APPROACH MATTERS

3.28 Our conclusion from reworking the model in these three ways is that the choice of modelling approach has the potential to make a material difference to the outcome of the model. It is therefore essential that the chosen modelling approach is one that has the confidence of stakeholders that it will support sound decision-making.

Figure 9

THE NET BENEFIT (COST) OF PFI RELATIVE TO PUBLIC SECTOR COMPARATOR IN A) THE VFM QUANTITATIVE TOOL AND B) THE SHADOW BID MODEL



Note

1 A negative value on the graph indicates the public sector comparator is cheaper than the PFI option.

Source: National Audit Office modelling

3.29 There are a variety of ways to model the quantitative comparison between PFI and a public sector comparator. HM Treasury adopts one approach that uses the social time preference rate and is in accordance with the Green Book. However in certain circumstances it may be appropriate to use different approaches. We have presented three more here, and other reasonable approaches also exist. The Treasury do not agree with these methodologies, but we are aware that the Treasury has used or encouraged the use of discount rates other than the social time preference rate for some recent commercial transactions and asset sales where it concluded that a different approach to appraisal was merited. In light of the fact that the choice of approach can have such a material impact on the result of the model, we believe the Treasury's choice of modelling approach to carrying out cost-effectiveness analysis for PF2 is a topic worthy of further exploration by the Committee.

LACK OF EVIDENCE SUPPORTING KEY ASSUMPTIONS

Optimism bias adjustment

3.30 As discussed in paragraph 2.2, an optimism bias adjustment³⁰ is added to the cost of the public sector comparator to represent the tendency of conventionally-financed projects to increase in price and overrun in time after the project is approved.

3.31 Guidance from the Treasury in 2004 stated that departments should collate databases of projects' performance so that they could measure the tendency of non-PFI projects to overrun on cost and time. However, none of the departments involved in these six projects systematically compiles the necessary performance data on both publicly and privately financed projects which would enable them to produce such benchmarks. In the past, officials have told us this was due to the lack of comparable non-PFI projects to provide such evidence.

3.32 In the absence of data on project performance to cost and time, project teams and their consultants working on all of the projects we looked at conducted workshops at which they estimated the likelihood that costs would rise above the levels envisaged at the early stages of the project. To do so, they drew on their experience and understanding of the project to predict the likelihood of certain risks occurring and the impact on the project. This acted as a proxy for optimism bias. This was a reasonable approach in principle, but it lacked an empirical basis and created uncertainty about a key variable of the model. This approach also made the adjustment difficult to scrutinise and challenge, since it was entirely based on the experience and understanding of the project team and their consultants.

3.33 We do not believe that it would be difficult to systematically collect evidence of project performance to time and cost. In practice, PFI has not had a monopoly on capital procurement in any sector and although no two projects are the same, there are often similarities between projects which would enable comparisons to be made. If government is to make sound, evidence-based decisions, the need to collate reference-class data will become increasingly important as the range of contracting models in use grows.

Shadow price of tax

3.34 To ensure that only net costs to the Exchequer were considered, the model had to take into account any tax that would be collected under PFI but not conventional procurement.³¹ To allow the estimate of the cost of PFI in the model to be compared to the finally approved deal it was stated gross of tax, and then, in order to ensure the two options were comparable, the tax on the PFI was added to the public sector comparator. This adjustment was known as the shadow price of tax.

3.35 HM Treasury commissioned financial advisers to develop generic benchmarks for this shadow price of tax, to make it simpler for project teams to estimate. All the projects we looked at added either 6 or 8% of the resource costs to the public sector comparator to reflect the corporation tax expected to be paid by the private sector under a PFI project. As the Committee of Public Accounts found,³² HM Treasury has not been able to verify whether these generic benchmarks reflected actual tax receipts across the programme. The more accurate estimates of the tax adjustment in the shadow bid models used by three of the projects we looked at suggests that, as an assumption, 6% is on the high side (see paragraph 3.27 and Figure 8).

Flexibility

3.36 Flexibility has been an ongoing issue for PFI. Project teams were able to make an adjustment to the model if they believed a significant change to the contract might be required during the project's lifetime. In the projects we looked at, these adjustments were not based on a historic record of changes and flexibility across the PFI programme. Instead they were based on the project team's necessarily rough estimates of the likelihood of the need to make a one-off change some time in the future and the potential cost of such a change.

3.37 For instance, one model we looked at estimated that it was 50% likely to need to alter the contract by a value equivalent to 50% of the project's capital cost in the tenth year of the project. An adjustment based on these estimates was added to both the PFI option and the public sector comparator, but the adjustment to the

³⁰ The post full business case optimism bias adjustment.

³¹ The model also had to take into account any tax that would be collected under conventional procurement but not PFI.

³² House of Commons Committee of Public Accounts, Lessons from PFI and other projects, Forty-fourth Report of Session 2010–2012, HC 1201, July 2011.

PFI option was 10% higher than the adjustment to the public sector comparator to reflect the premium the contractor would require in order to make the change.

Residual value

3.38 If the major maintenance and life cycle costs of the public sector comparator were lower than those of the PFI option then residual repair costs were added to the public sector comparator to reflect the cost of bringing the asset up to the PFI standard of repair at the end of the project. These residual repair costs could be very large. In the one instance where we saw them used, the repair costs were three times the original cost of construction once cumulative inflation over the lifetime of the contract was taken into account. The Treasury told us the objective behind this adjustment was to reflect the lower spend on life cycle and maintenance costs under the conventional option compared to the PFI option.³³ The adjustment made a material difference to the result of the model. PFI requires a relatively high standard of maintenance and repair throughout the project³⁴ on the principle that this will keep the overall whole life costs down. However, departments have not collected the evidence to show how much of this additional cost of maintenance actually prevents costly dilapidation of the assets rather than simply being cosmetic or otherwise unnecessary.

TEAMS OVER-RELY ON THE MODEL

3.39 Despite Treasury guidance to the contrary we found that, for all six projects we looked at, the project teams placed considerable emphasis on the output of the model in the business case submitted to their own department and to the Treasury for approval; the project teams appeared to treat the model as a “must pass” test. In one case, we saw correspondence showing the department advising the local body that the model would need to show PFI was cheaper if the project was to receive funding. This emphasis on procuring authorities justifying the use of PFI almost exclusively by reference to the model aligns with our previous experience in auditing PFI projects. The Treasury also acknowledges that all too often the quantitative tool has been interpreted in practice as a pass/fail test with insufficient weight given to qualitative judgements.³⁵

3.40 Treasury guidance is clear that financial models such as the VFM quantitative tool are not robust enough to be relied upon, on their own, to demonstrate value for money. Like many financial models the quantitative tool was based on simplifying assumptions, which can be highly subjective. Forecasts often look 30 or so years into the future—well beyond the time frame in which anything can be predicted with certainty. And models are prone to error, including user error.

3.41 While the model compared PFI to “conventional procurement”, it did not enable the comparison of other contracting approaches with PFI. For the six projects we looked at it was not always clear what was meant by conventional procurement. In two of those cases “conventional procurement” was not considered by the project team to be the next best alternative, so in those cases the model could not indicate whether or not PFI was the cheapest approach available. The Treasury recognises that in some instances where the model was used, the conventional option to which PFI was compared was in fact undeliverable.³⁶ We believe that an appraisal approach which enables decision makers to compare multiple quantitative analyses and a range of possible approaches is most likely to lead to sound decision-making.

3.42 Project teams’ ability to gain additional benefit from using the model was hindered by the lack of visibility of the model’s workings. Many of the assumptions were hard-wired into the model and most of the workings were hidden. While this made it easier for those reviewing the use of the model, it also meant project teams were less able to explore the way their assumptions and estimates interacted and affected the project. Treasury guidance did, however, emphasise the evaluation of the sensitivity of the different variables within the model through the indifference point analysis.

3.43 Along with the Treasury, we would like to see modelling used more intelligently. This requires models to be designed in such a way that they aid a project team’s understanding of their project and allow the team to explore the relationships between the project’s various elements. The shadow bid model served these functions well but was only used in three of the six projects we looked at.

3.44 In accordance with Treasury guidance, we would like to see project teams treat models as just one element, set alongside other factors, which informs their judgement about which contracting approach offers best value for money.

THE QUALITATIVE ASSESSMENT

3.45 Our analysis has focused on the role of modelling within the overall VFM assessment. But it is important to recognise that modelling is only one component of the assessment. In particular, Treasury guidance requires project teams to carry out a qualitative assessment of all projects where the use of PFI is proposed.

³³ The net present value of the residual costs was £36 million, even though these costs are heavily discounted because they occur relatively far into the future.

³⁴ See, for example, the maintenance costs of hospitals that we set out in *The performance and management of hospital PFI contracts*, HC 68, June 2010.

³⁵ HM Treasury, *A new approach to public private partnerships*, December 2012.

³⁶ See footnote 35.

3.46 The qualitative assessment poses around 50 questions to inform an overall assessment about whether PFI is viable, desirable and achievable for the project in hand. The qualitative assessment, unlike the quantitative assessment, does not require project teams to compare PFI to the public sector comparator. Instead, all the questions in the qualitative assessment are focused on whether or not PFI will meet the intended outcomes of the project and is a suitable delivery methodology.

3.47 Under the desirability section, the accounting officer is asked: “overall, is the accounting officer satisfied that PFI would bring sufficient benefits that would outweigh the higher costs of capital and any other disadvantages?” The underlying assessment questions do not discuss the higher cost of capital or seek to prompt a detailed exploration of the benefits and disadvantages of PFI. It is therefore unclear how the accounting officer can give an informed response to this question.

3.48 Almost all of the assertions in the qualitative assessments we reviewed lacked a reference to any supporting evidence. And some of the statements, for example that PFI encourages innovation, directly contradicted evidence heard and reported by the Treasury Committee in its 2011 inquiry on PFI.³⁷ We rarely saw a response that referred to a specific example of a previous project. Instead, when references were made they tended to be generic to PFI, sometimes drawing on HM Treasury guidance.

3.49 The qualitative assessment is a useful checklist for procuring authorities to help them consider whether PFI is appropriate for their project. It also encourages authorities to consider issues such as timescale, innovation and risk management. However, it does not enable project teams to assess whether or not PFI is value for money either in comparison to a public sector comparator or to any other alternative procurement route.

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³⁷ House of Commons Treasury Committee, Private Finance Initiative, Seventeenth Report of Session 2010–2012, HC 1146, July 2011, paragraph 46