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# Public-private Partnerships for Government Financing, Controlling Risk, and Value-for--money: The UK Experience

Joseph G. San Miguel

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**Public-private Partnerships for Government Financing,  
Controlling Risk, and Value-for-money: The UK Experience**

**September 1, 2006**

**by**

**Joseph G. San Miguel, Professor**

**Donald E. Summers, Lecturer**

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GRADUATE SCHOOL OF BUSINESS & PUBLIC POLICY  
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# Abstract

One of the key requirements to a successful Public-private Partnership (PPP) is the transfer of risk from the government to the private sector. This research examines the PPP experience in the United Kingdom (UK) Ministry of Defense to determine if they would be applicable to the US Department of Defense (DoD). PPP agreements have provided the UK increased capabilities. Also, this research provides an in-depth analysis of Private Financed Initiatives (PFI) that Serco Inc. has undertaken. Finally, this research evaluates the increases in value-for-money resulting from the PPP transfer of risk to the private sector.

The research concludes that PPPs should be continued and expanded to provide increased real-time capability to the DoD while supporting private industry. Since the government has the lowest cost of borrowing, PPPs agreements may not appear to be cost effective as a means of procurement. However, the benefits from transferring risk to the private sector can more than offset the higher financing cost. PPPs reallocate risk and up-front capital requirements allowing the government to spread program cost over time. Without initial capital outlays, the government can acquire higher priority goods and services with its limited resources. In addition, PPPs provide the government with an increased infrastructure and technological capability than would otherwise not be available.

**Keywords:** Public Private Partnership, PPP, Energy Savings Performance Contracts (ESPCs) for mobile assets, Privatization, Outsourcing, B-52H re-engining program, Alternative Forms of Financing Defense Requirements, Fee for Service Contracts



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Disclaimer: The views represented in this report are those of the author and do not reflect the official policy position of the Navy, the Department of Defense, or the Federal Government.



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# Executive Summary

There is clearly heavy pressure in Washington to limit the DoD acquisition budget. Yet, a steady stream of “critically important” new weapons systems is under development across all branches of the military. The result will necessarily be that many “highly desirable,” if not “critical,” programs are cut back or even eliminated.

One way to ease this potential impairment of National Security is to fund some DoD investments outside the normal Congressional appropriations process. One term for such alternative financing mechanisms is “Public-private Partnerships” (PPP). PPPs have generated substantial benefits for the public sector by: providing greater financing flexibility, encouraging innovation, reducing risks, and saving time and money on projects. Acquiring combat capability through PPPs is an innovative approach that has the potential to foster efficiency, flexibility, and creativity in the DoD acquisition process.

This report examines the use of Public-private Partnerships (PPPs) in the United Kingdom (UK), a country that has developed an acceptance and appreciation of PPPs to provide greater value for its citizens. We will address the concepts of risk transfer and an economic tool called the Public-sector Comparator (PSC) that is used in the UK. The PSC evaluates the value gained in the transfer of risk to the private sector and determines whether traditional procurement or PPP is the better solution. A case study illustrates the application of the risk transfer and the PSC.

The DoD has not yet used the PSC to evaluate the risk of PPPs. This research supports full consideration of the transfer of risk and use of the PSC in overcoming some of the obstacles to PPPs. In an era of funding reductions, the use of PPPs has the potential to provide the DoD with required combat capabilities in a timely and efficient manner.



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# Introduction

Public-private partnerships (PPPs) involve private sector supply of assets and services that have traditionally been provided by the government. PPPs allow a public agency to access the private sector’s technical expertise, knowledge, insight, and capital to achieve mutually beneficial goals. These partnerships have proven to be advantageous to both the government and private sector and, as a result, have been widely used in a number of countries.

Using a “full funding” policy, Congress has traditionally authorized and appropriated the full cost of the defense requirement in the budget request, rather than incrementally funding the requirement over its life, as would be the case in PPPs. However, providing budget authority for the large up-front costs of capital assets creates challenges when resources are constrained—as they potentially will be with the steady stream of “critically important” new weapons systems under development across all branches of the military. One way to ease this potential impairment of National Security is to fund some DoD investments through PPPs. PPPs have generated substantial benefits for the public sector by providing greater flexibility in financing, encouraging innovation, reducing risks, and saving time and money on projects. Acquiring combat capability through PPPs is an innovative approach that has the potential to foster efficiency, flexibility, and creativity in the acquisition process.

Some argue that PPPs bypass Congressional oversight, reduce spending controls, and move public investment off budget and debt off the government balance sheet, while the government still bears most of the fiscal risk. Therefore, adequate risk transfer from the government to the private sector is a key requirement if PPPs are to deliver high-quality and cost-effective assets to the government.





The purpose of this report is to examine, through a case study, the successful experiences of the United Kingdom's (UK) use of PPPs and Public Financing Initiatives (PFIs), a form of PPPs, in acquiring defense capabilities. The UK uses an economic tool call the Public-sector Comparator (PSC) to better compare the value gained in the transfer of risk and determine whether traditional procurement or PPPs is the better solution.



# Basic Features of Public-private Partnerships

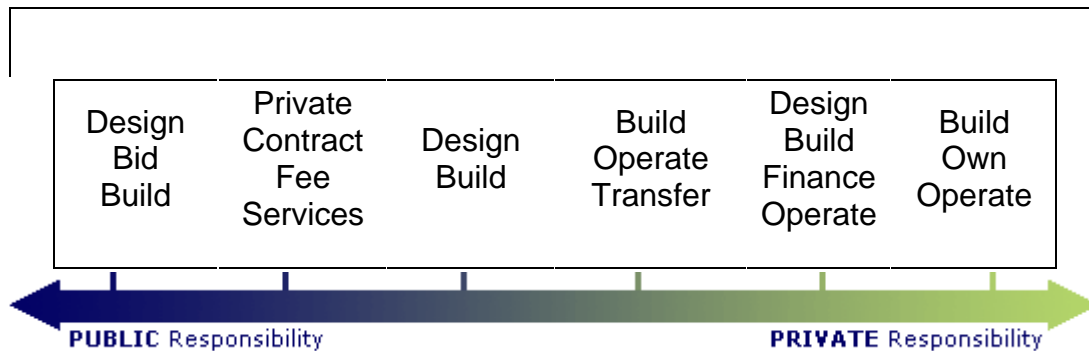
The National Council for Public-private Partnerships defines PPPs as follows:

A Public-private Partnership is a contractual agreement between a public agency (federal, state or local) and a private sector entity. Through this agreement, the skills and assets of each sector (public and private) are shared in delivering a service or facility for the use of the general public. In addition to the sharing of resources, each party shares in the risks and rewards potential in the delivery of the service and/or facility (National Council for Public-private Partnerships, 2006).

Figure 1 (US Department of Transportation, 2004) displays the complete spectrum of PPPs in relation to the risk incurred by the public or private organization. The PPP continuum begins with simple service relationships that exist today and ends with private firms procuring government hardware and providing support services. Value-for-money exists throughout the range of partnerships based on the program requirements. The left end of the spectrum, Design/Bid/Build, represents full public responsibility and ensuing risk. The right side of the spectrum, Build/Own/Operate, similarly represents full private responsibility and associated risk. When evaluating PPP contracts, determining who bears what responsibility is critical in determining value-for-money. In this case, responsibility and level of risk incurred is synonymous. The following paragraphs will further explain the spectrum of PPPs. The discussion will begin with the highest risk borne by the government, Design/Bid/Build, transitioning through the risk spectrum, and ending with risk being completely shouldered by the private sector.



**Figure 1. Responsibility/Risk Spectrum**



### Design/Bid/Build:

The Design/Bid/Build relationship is the traditional method used in government procurement. This is a PPP in that the government negotiates with private industry to complete a project rather than the government completing the project in house. This method is seen predominantly in the procurement of aviation assets.

### Private Contract Fee Services:

The “fee-for-service” contract is also known as “outsourcing.” Private firms are engaged to perform services necessary to the operation of the government. Generally, any service not considered “inherently governmental” can be bundled in a fee-for-service contract. This method is becoming commonplace throughout the public sector, as government agencies divest themselves of activities which are not within the government’s core competence, such as janitorial services, food and beverage service, and security forces.

### Design/Build:

The Design/Build partnership is a modification of the Design/Bid/Build partnership. The Design/Build model combines the design and building phases into a single prime contractor. This model still requires that the public entity provide all



up-front capital requirements, but shifts some of the risk/responsibility for design to the private builder.

#### Build/Operate/Transfer:

The Build/Operate/Transfer model or Government-owned, Contractor-operated (GOCO) model provides a bundle of services to the public agency. The private-sector partner is responsible for the construction, operation, and maintenance of the project. The public entity provides the up-front capital to build the asset and the funding stream to maintain the project. The added benefit to the public sector is that the acquisition and lifecycle support cost is fulfilled by a single contractor for a fee.

#### Design/Build/Finance/Operate:

The Design/Build/Finance/Operate model bundles the total project cost in a single comprehensive program. This partnership provides shared financial responsibility for the ownership of the total program. It is a modification of GOCO; here, the private agency provides some debt and equity financing for the project in return for future income streams. These partnerships have enjoyed considerable success at the municipal level in completing bridges and highways. Private companies are contracted by the local government to design, build, and operate public roads in return for a portion of future toll revenue. This type of partnership may also take the form of Contractor-owned, Government-operated (COGO) if the financing were structured in favor of primary private ownership.

#### Build/Own/Operate:

Build/Own/Operate is the consummate PPP in which major responsibility for financing, operating, and maintaining the project is contracted to the private organization. Commonly referred to as a Contractor-owned, Contractor-operated (COCO) partnership, this arrangement places the full up-front capital and cost burden on the private organization. This transfers the risk to the private sector for a



secured future income stream. In the UK, this model is also referred to as a Private Finance Initiative (PFI).

This research evaluates the application of the Design/Build/Operate (COGO) and Build/Own/Operate models (COCO). The difference between the models lies in the financing mechanisms employed. The PFI/COCO model retains private ownership, whereas the COGO allows for public ownership with some use of private financing. The British Ministry of Defense (MoD) used this model in procuring helicopter simulation facilities and a world-renowned joint service staff college. Both projects were entered into by the MoD and a consortium of private firms. Upon completion, the facilities are owned and operated by the private firms to provide a service for a fee to the government. The helicopter simulation facility project will be discussed in greater detail as a case study in a later section of this report.



## Risk Transfer

Optimal sharing of risks between the private and public sector is important to realizing the best value-for-money in a PPP arrangement. There are certain risks that are best managed by the Government, and transferring these risks would either not be viable or not offer value-for-money to the public sector.

PPPs have been successfully used in a number of countries, including the UK. Its use of Public Financing Initiatives (PFIs), a form of PPPs, comprises about 11% of the country's budget. The UK's Ministry of Defense (MoD) has 46 PFI projects that constitute over 8% of their defense budget. Their success has been noted in a report released by HM Treasury (the UK equivalent of the GAO) based on investigations of 61 PFI projects. The key findings were:

- 89% of projects were delivered on-time or early.
- All PFI projects in the HM Treasury sample were delivered within public-sector budgets. No PFI project was found where the unitary charge had changed following contract signature—other than where user requirements changed.
- 77% of public-sector managers stated that their project was meeting their initial expectations. (HM Treasury, 2003)

It appears that, when risks are shared, projects are more likely to be completed on-time and on budget. Given the success of PFIs in the UK, the next section examines the UK's approach to risk allocation and how this impacts financing new assets outside of the traditional procurement stream.

## Background

In the UK, Public-private Partnerships are split into three distinct categories. The first and largest category includes the Private Finance Initiative (PFI). In these arrangements, the public sector purchases goods or services on a long-term basis to take advantage of private-sector management skills that are incentivized by having



their own money at risk. This includes projects where the private-sector partner is responsible for providing a public service, including maintaining, enhancing, or constructing the necessary infrastructure or assets.

The second PPP category includes a strategic private partner with either a majority or minority equity stake in a state-owned business. The third PPP category involves selling government services into wider markets and other partnership arrangements where private-sector expertise and financing are used to exploit the commercial potential of government assets.

PFI's are used in the UK to finance large capital assets and services in situations that offer the best value-for-money, similar to the concept of lower lifecycle costs in the US acquisition cycle. Similar to the US, the UK recognizes that major capital asset procurement must include the cost of the asset's entire lifecycle. Therefore, the lowest cost bidder does not necessarily win the contract. Also, the PFI's value-for-money benefits should not result from worker layoffs or decreased employee quality of life.

The UK defines "value for money" as follows: "the optimum combination of whole-life cost and quality (or fitness for purpose) to meet the user requirement" (HM Treasury, 2003). This does not allow bias to influence which procurement option is best for the specific need—whether it is prime contracting, design-and-build contracting, or PFI. To ensure that PFI is the best option, the UK Government undertakes a full evaluation of the costs and benefits including an assessment of risk to both the government and the contractor.

Since, in a PFI, the private sector takes responsibility for the quality of design and construction and for long-term maintenance on an asset, the transfer of risk helps create value-for-money. Therefore, in a perfect PFI scenario, value-for-money is achieved primarily through proper transfer of risk to the party in the best position to limit that risk. The government retains risk of contract change to keep flexibility (such as the number of ships purchased), or bears the cost of adding a new system



to an already designed platform. The valuation of these risk transfers makes these arrangements attractive to the public sector. This concept was used to justify the use of PFIs to finance the UK Medium-support Helicopter Aircrew Training Facility. This report will discuss the UK Medium-support Helicopter Aircrew Training Facility following a presentation of important concepts related to risk and its evaluation.

## Risk Sharing

Optimal sharing of risks between the private and public sectors is important to realizing the best value-for-money of any PFI arrangement. However, there are certain risks that are best managed by the Government. Transferring these risks to the private sector would either not be viable or not result in the best value-for-money to the public sector. When risks are shared, projects are more likely to be completed on-time and on budget. Therefore, in the next sections, the UK's approach to the assumption of risk by the government and the private sector and cost of risk are examined.

### **Government Risk**

The general principles behind the Government's approach to risk-sharing in PFI relationships are as follows:

- The Government underwrites the continuity of public services, and the availability of the assets essential to their delivery.
- The private-sector contractor is responsible, and at risk, for its ability to meet the service requirements it has contractually agreed to provide.
- The full value of that debt incurred by the project, and the equity provided by contractors and third parties, is the cap on the risk assumed by the private sector. (HM Treasury, 2003)

The UK government retains risk in five areas much the same way a public entity would in normal procurement. The first is associated with date and adequacy for delivery. For instance, if the construction of a warship did not have enough of a certain capability such as beds, then the government assumes the risk and extra





cost associated with adding more capability. The second is the possibility of a future change in public-sector requirements. The government retains the responsibility to make alterations within provisions set forth in the contract, but will incur the cost of making changes requested after signing the contract. In the third area, the public-sector retains the risk involved in planning and procuring public services that meet public needs. The fourth area involves the extent to which an asset is used over the contract's life. This primarily deals with land-based facilities. However, this can be applied to capital assets such as transport planes, trucks, etc. Finally, the government retains the risk of general inflation.

### **Private-sector Risk**

Risks that are transferred by contract to the private sector are explicitly identified and limited. They typically apply to contract terms of 15-30 years and cover five areas (HM Treasury, 2003). First, the required standards of delivery must be satisfied. If the project's design (as determined by the private sector) does not provide the required service's needs, the private sector pays the cost of correcting the design to meet contractual specifications. This implies that all specifications are identified at project inception. Therefore, this type of financing is best used for projects of a specified duration and that uses mature technology. PFI financing would be difficult for projects with high technology development costs because the Research and Development program for a specific technology can experience many unpredictable set backs and cost overruns.

Second, responsibility for a cost overrun during construction must be noted. For instance, if after approval of the design and construction plans, it is discovered that more physical support is needed for the weight of a ship system, then the private sector pays the cost to correct the deficiency to comply with standards. In conventional procurement, the government would be forced to pay the charges.

Third, the private sector's risk associated with the timely completion of a project is specified. If the project is delivered early, the private sector stands to

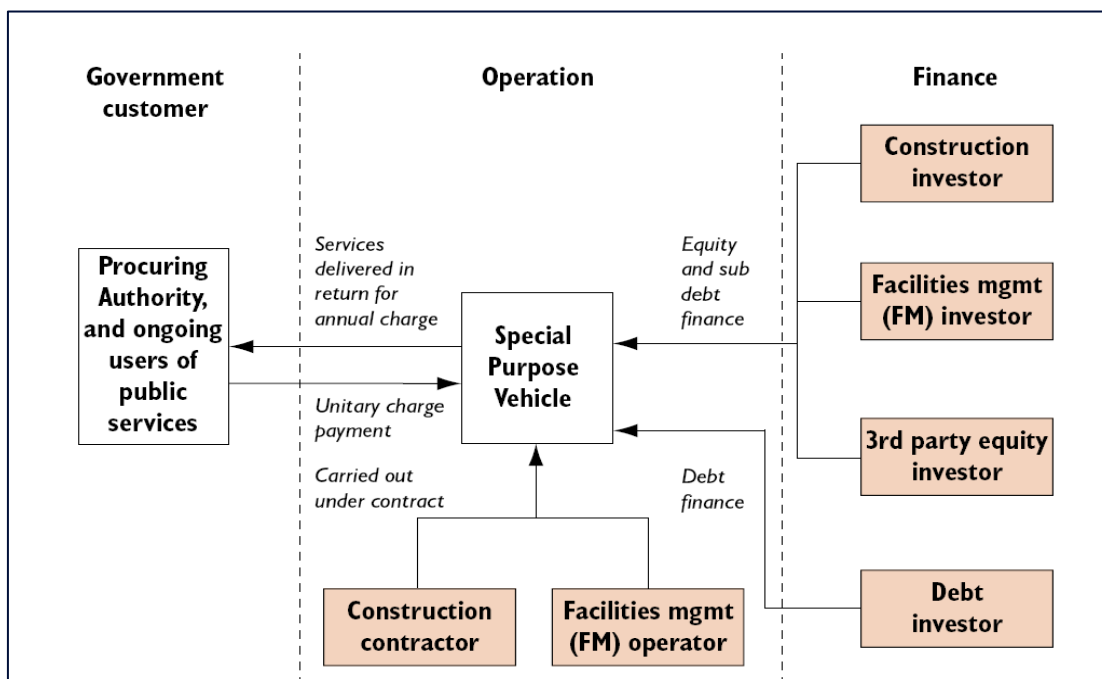


increase its profit through early-completion bonus payments. However, if the project is completed late, the private sector incurs the extra cost.

Fourth, the private sector shares the total risk due to underlying costs and the future costs associated with the asset with the operator of the service. This occurs when the private sector assumes the risk of any latent defects in an acquired PFI asset. The private sector bears the cost of remedies needed to bring the asset to its contractual standards. For example, in providing refueling tankers, the private entity (as the “owner”) would assume the costs of the upkeep of the aircraft and assume the risk of defect upon delivery from the aircraft manufacturer. Finally, the private sector bears the risk of physical damage to the asset while it is in their custody.

The total risk assigned to private-sector entities is in turn assigned to the various private contractors as each assumes its respective portion of the project. Figure 2 shows the structure of a typical PFI and how the risk is allocated to the parties involved in a project (HM Treasury, 2003).

**Figure 2. The Consortium Company Joint Venture Model**



In this structure, the private sector reallocates risk to subcontractors, the most appropriate parties to mitigate risks. Typically:

- The construction contractor, under a subcontract with the consortium company, has the design, construction and completion risk;
- The service provider, or facilities management operator, under a subcontract with the consortium company, is assigned the risk of timely and cost-effective service provision;
- Insurers provide protection for risks of damage and business interruption; and
- The consortium company, the Special Purpose Vehicle (SPV), its lenders and investors are, therefore, left with a series of residual risks, some of which are credit risks on the subcontractors' performance.

The benefits of this consortium joint-venture structure are that it permits different parties to become involved in the PFI and share the risks effectively. It also can involve third parties, such as financiers, who must assess the strength of the contractual arrangements and the level of support offered as they estimate the likelihood of repayment of their loans (HM Treasury, 2003).

The PFI contract usually stipulates that the government can change the design or capability to provide the government flexibility and public-sector safeguards. However, the government will bear the cost of the changes. In the event of poor performance, the contract stipulates that the SPV can hire and fire subcontractors, and the government can withhold payments. The revenue loss from deductions and penalties provides a powerful incentive for the PFI contractor to correct deficiencies.

The repercussions of the PFI's lost revenue are significant because shareholders' returns will decline. In addition, third party creditors' (i.e., banks) risk may increase if the PFI contractor is unable to meet its debt service payments. Creditors have contractual rights over the other private-sector participants to enforce performance. For example, they can replace private-sector participants with other companies that are better able to deliver to the required standard. In extreme cases



such as total failure of the private sector, the government retains the right to transfer the entire program from the PFI umbrella. Normally, upon expiration of a standard PFI contract, the key assets needed to continue to deliver public services revert to the public sector free of charge (HM Treasury, 2003). In the US, the government would likely pay the contractor a portion of the asset's useful value or its salvage value.

## Cost of Risk

Private contractors, equity investors and bankers evaluate the cost of risk in a PFI contract by discounting all future cash flows at a specified discount rate—which includes an implied risk premium that is assessed to the project. This rate is usually much higher than the government's risk-free borrowing rate. In a 2001 GAO study, it was determined that the promise of an internal rate of return of approximately 15% would draw considerable interest from the private sector (Ungar, 2001).

A common view is that these financing arrangements with the private sector are inherently bad for the government because the government has the lowest “risk-free” cost of capital. However, the HM Treasury reported that the taxpayer underwrites the risk associated with publicly financed procurement projects. This risk is then captured in a lower cost of capital to the government. Taxpayers bear the risk when a cost overrun occurs due to a construction set back. It is, therefore, inappropriate to compare a “risk-free” cost of capital with the private-sector cost of capital. PFI projects provide better value-for-money because the private sector assumes project pricing and risk. This cost savings is then passed onto the government (HM Treasury, 2003).

PFI risks are priced individually for each project option. The discounted costs of these risk-adjusted options can then be compared to accept the best project or option in light of risk and uncertainty. HM Treasury found that in traditional public procurement, the public sector pays for risk not in its borrowing cost, but when the risks materialize and must be covered (HM Treasury, 2003).



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# The Public-sector Comparator

One major difficulty in comparing the value of a lease to the value of a direct purchase is valuing the allocation of risk. It is easy to compare the two alternatives using discounted annual cash flows and the net present value associated with each. However, in quantifying the greatest advantage associated with a lease, valuing the allocation of risk is not so easy. The Public-sector comparator (PSC) quantifies the value of this transfer of risk and assigns a monetary value to determine which proposal delivers the greater value-for-money.

During the early 1990s, Great Britain had a variety of public goods needing refurbishment, but the government did not want to significantly increase taxes or the national debt (HM Treasury, 2003). The government's answer was to embrace PPPs ( or PFIs, as it calls them) to make the improvements. Great Britain was not a stranger to privatizing public goods, but still faced a major obstacle in the acceptance of PPPs. The greatest difficulty was proving that a greater value of money could be earned in a PPP than a traditional procurement program. This proof was provided by the PSC.

## Components of the PSC

The goal of the PSC is to improve the comparison of the purchase and PPP options. In order to more accurately depict the costs and benefits of each financing option, it is important to consider all the costs and benefits of each. A PSC is a function of four variables expressed as follows (State of Victoria, 2001):

$$\text{PSC} = \text{Transferable risk} + \text{Competitive Neutrality} + \text{Raw PSC} + \text{Retained Risk}$$

Each of the above four variables constitutes a portion of the value of the contract and is important to consider when evaluating the value of a PPPs. These will be defined in the following sections.



## **Competitive Neutrality**

Competitive neutrality is an attempt to negate any financial advantages or disadvantages the government enjoys over the private sector. For instance, the government does not pay taxes—giving it an advantage over the private sector. Conversely, a private firm will not face the scrutiny that a public sector project may face.

## **Raw PSC**

The Raw PSC is an estimate of the government's cost in a traditional procurement. The Raw PSC is comprised of three variables: capital costs, operating costs, and third-party revenue. As shown in the equation below (State of Victoria, 2001), these are the values used in comparing lease-versus-buy alternatives:

$$\text{Raw PSC} = (\text{Operating Costs} - \text{Third-party Revenue}) + \text{Capital Cost}$$

Operating Costs and Capital Costs are associated with the purchase, operation, and maintenance of the good or service. Capital costs are all costs (direct and indirect) that are associated with providing the good or service. Third-party revenue is that revenue that may be lost by a government-owned facility which provided services to the private sector. For instance, if the government is deciding whether to privatize a shipyard and pay a private firm for services or maintain a government-operated shipyard, the potential lost revenue from services the government may provide to the commercial sector may be subtracted from the costs of operating the shipyard.

## **Transferable Risk**

Transferring risk to the party best able to mitigate that risk is one of the greatest advantages of a PPP and one of the most often overlooked variables by those opposed to PPPs as a method of procurement. By transferring the risks to different parties in a contract, the project should increase the public sector's value-

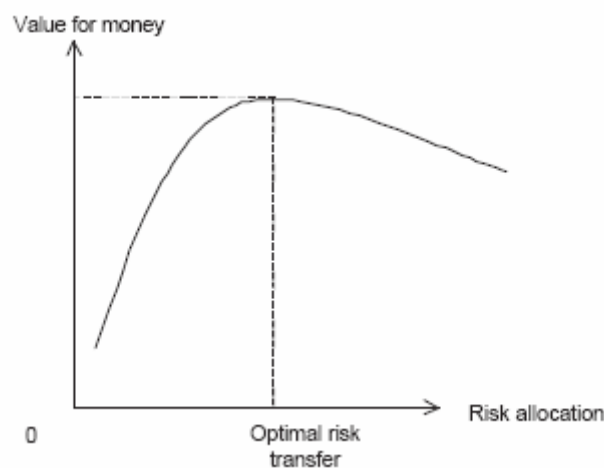


for-money. An increased value-for-money for the public sector and profit for the private sector is a winning situation for all parties involved.

### Retained Risk

Retained Risk represents the cost associated with risk that will be assumed by the government. The key for a successful PFI is to transfer the risk to the party best able to mitigate that risk, as shown in Figure 3 (State of Victoria, 2001)

**Figure 3. Optimal Risk Allocation**



With Value-for-money depicted on the vertical axis and Risk allocation on the horizontal axis, the curved line represents how the value-for-money increases as risk is transferred among parties. The value-for-money increases rapidly until the optimal risk transfer point is met and then the amount of risk transfer begins to adversely affect the value-for-money. At the optimal point, risk is properly distributed among parties, and all parties receive the maximum benefit.

### Calculating Risk

The dispersion of risks throughout the parties in a government project may be a great advantage for the PPP options, but it is also very difficult to accurately quantify risks. An effective means of establishing a baseline level for risk follows the steps below (State of Victoria, 2001):





1. Identify risks
2. Quantify consequences associated with each risk
3. Estimate the probability of each risk occurring
4. Calculate the value of risk

### **Identifying risks**

The risks associated with a project may range from those associated with the contract and financing to those incurred during construction, operation, or possible destruction. It is important to develop a list of risks incurred at every step in the procurement process. This task can be more easily accomplished using subject matter experts and/or consultants.

### **Quantifying Consequences**

Quantifying the consequences may be even more subjective than identifying the risks of the project. Determining point estimates may be extremely difficult and may represent a “best guess” in a given scenario. Either a risk matrix or historical data is used for estimations, but the goal should be to develop a reasonable assessment of possible consequences of specific risks, not a concrete value for the potential cost to the government.

### **Probability of risk**

The probability of risk is best explained as the likelihood that the specific risk will be realized. There are a variety of methods for developing these values, but the process is subjective. However, it is better to attempt to value additional costs and slightly miss the mark than to completely disregard these costs and be grossly optimistic.



## The Value of the Public-sector comparator

As depicted in Figure 4 (State of Victoria, 2001), the sum of the four PSC components are equal to the real costs associated with a given project.

**Figure 4. Components of PSC**

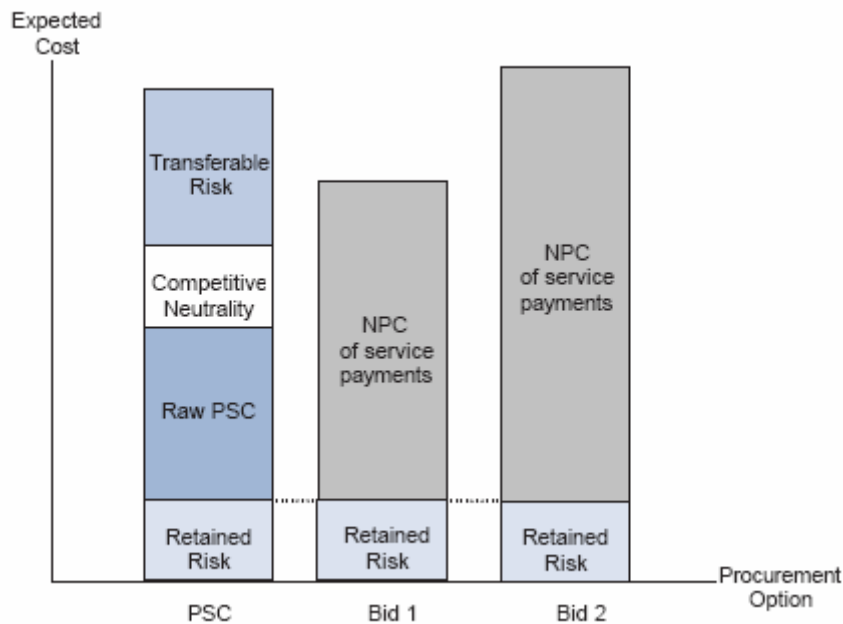


Figure 4 shows the PSC option and two different bids compared with the procurement option for a given project. The PSC bid depicts the expected cost of the project divided into its four elements. The two alternative bids only depict the overall expected cost for each bid. The PSC helps the government determine the true value of a PPP bid. Without considering the risks associated with service and acquisition, the true costs to the government are not reflected in the procurement option, which may appear to be the better option. By explicitly stating its risks, the government is better able to compare all the costs associated with procurement and determine the best value-for-money solution.

## Medium-support Helicopter Aircrew Training Facility (MSHATF) CASE STUDY

This section presents a case study to illustrate the application of risk transfer, the PCS model, partner relationships and responsibilities, and financial analysis. Serco, Inc., one of the partners in this project, provided information and their insights to prepare this case study. Serco pioneered the Private Finance Initiative in the UK and has 600 existing contracts in over 35 countries, employing over 35,000 personnel worldwide (Serco.com, 2005).

### **Background**

The medium-support helicopter training facility (MSHTF) located at Royal Air Force (RAF) Benson teaches all facets of aviation to RAF helicopter Pilots. The facility is equipped with a tactical control center designed to simulate a military flying environment, computer-based trainers to support ground school, and six fully integrated motion control helicopter simulators. The training staff is comprised entirely of civilian helicopter pilots and qualified ground-training instructors.

The primary objective of the facility is to reduce the flight-hour requirements of the actual flying squadrons. The medium-lift helicopter mission requirements are tactically diverse. The missions require crews to operate tactically under low-light conditions in potentially hostile environments. Simulator flight training reduces the risk inherent with operating an aircraft in real conditions. The RAF can generate cost savings by reducing flight hours and eliminating the risk associated with operating fleet aircraft in dangerous training environments. The project viability rests in the cost savings generated by the aircraft flight hours saved coupled with the efficiencies gained through using commercial sources to run the project.

### **Issues and Scope**

The Ministry of Defense (MoD) Procurement Agency identified a genuine need: reduce flying hour cost while maintaining pilot proficiency and quality. In



developing an analysis of alternatives, the MoD identified three potential courses of action (HM Treasury Task Force, 1999):

1. Do nothing—continue using current training devices until beyond repair and then purchase new devices.
2. Provide for the minimum requirements—meet the need half way and limit the financial breadth of the contract.
3. Provide for the training needs as evaluated.

The third option was chosen based on an internal analysis of the economic value gained. However, the economic value gained is contingent upon the “quality” and “usage” of the simulators being negotiated. These are key cost drivers that require considerable capital expenditure at the inception of the project. Due to the large capital outlay necessary for construction and constrained financial resources typically confronting government agencies, the MoD identified a Private Finance Initiative as a viable option. Additionally, the MoD firmly believes that incorporating the private sector in all aspects of procurement can be beneficial. Sir Robert Walmsley, Chief Executive of the Defense Procurement Agency, states: “A significant outcome has been to show that the role of the private sector in defense can be widened through the use of PFI contracts, and that substantial value-for-money improvements can be achieved” (HM Treasury Task Force, 1999).

CVS is a partnership consisting of three companies: CAE Electronics, simulator manufacturer; Vega Group, computer technology provider; and Serco, facility operators and aviation-expertise provider. The contract was awarded to CVS in October 1997 by the Defense Procurement Agency (DPA) to design, build, and operate the medium-support helicopter training facility. This contract embodies the pure definition of a Contractor-owned, Contractor-operated (COCO) relationship. CVS will undertake the entire project—including soliciting private institutions to provide the necessary equity to finance the building phase. The alternative option evaluated by the MoD procurement service follows a more traditional Government-



owned, Contractor-operated (GOCO) format in which the government agency provides the required capital in the first year.

The following equipment and services were to be provided to the MoD (HM Treasury Task Force, 1999):

- 3 Chinook HC Mk 2 Dynamic Mission Simulators
- 2 Merlin HC Mk 3 Dynamic Mission Simulators
- 1 Puma HC Mk 1 Dynamic Mission Simulators
- Aircrew CRM training
- Computer-based Training Package for Chinook and Merlin
- Comprehensive Ground School
- Local Area Network Connectivity for Multiple Unit Simulation
- Facilities and Support for the Simulators and Ground School

The helicopter training facility and associated support structures are located at RAF Benson in Oxfordshire, UK. The simulator facility location was chosen in order to optimize training and minimize traveling time to operational airfields. The Merlin and Puma aircraft currently operate from RAF Benson while the Chinook aircraft are flown in from RAF Odiham (50 Km South of Benson). Aircraft proximity to the training facility is a critical part of the contract.

The MoD clearly stated that a large component of the comparative analysis should include the fuel cost savings from using simulators vice aircraft. However, at the conclusion of simulator and ground-school training, students must qualify in actual fleet aircraft. Long transit times that cannot be used for training purposes simply increase the overhead cost involved and detract from the viability of the project.

## **Contract**

The MoD entered into a 40-year contract with CVS and is obligated to 20 years of guaranteed usage. The second 20-year period of the contract will be



reevaluated at the completion of the first 20-year portion. The MoD is not obligated to continue after the first 20 years, and can cancel without financial recourse. The contract, from the MoD point of view, is designed to provide a service for a fee. The MoD, in essence, is purchasing a capability rather than procuring a simulator facility. The construction risk and success of training efficiencies are placed on the contractor. Payments on the contract are based on MoD actual usage, quality of product, and availability. The MoD is billed at an agreed-upon rate based on anticipated usage. The hourly rate is gradually reduced over time through the 20<sup>th</sup> year of the contract. The decreasing fee was imposed by the banks due to the initial capital requirement (Symes, 2006). The MoD is billed proportionally to the hours used in excess usage or penalized for under usage. Similarly, the contractor is penalized for lack of quality service or inability to provide training when it is scheduled. This payment scheme incentivizes both parties to maximize potential usage of the assets.

Additionally, due to the cyclic nature of MoD requirements, the contract was designed for only 80% of the actual MoD usage requirement. Even if the MoD required 100% of its contractual obligation, one-third facility capacity would still be available for CVS to solicit third-party usage. Third-party facility usage is beneficial to both the MoD and CVS because outside revenue is divided proportionally between the MoD and CVS. The MoD retains priority over simulator services. A multi-party initiative such as this provides the potential for underutilized government assets (land) to be tied to procurement projects with revenue offsets, helping reduce the overall cost to the government. PPPs help take advantage of underutilized government capacity.

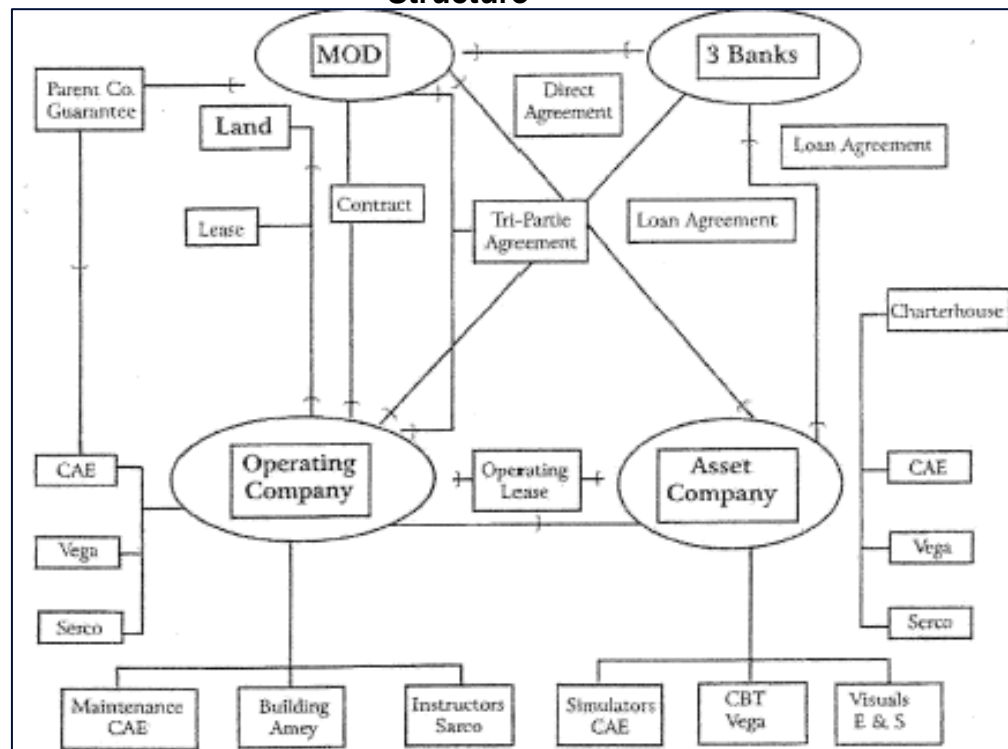
### **Contractor**

The contractor, CVS, can be divided into two separate companies with different contractual obligations. In order to understand stakeholder requirements and incentives in relation to the contractor, the role of the asset and individual operating companies must be discussed. Stakeholder relationships consist of the



equity shareholders, debt providers (banks), and the contracting agency (MoD). Figure 5 graphically represents the relationships between participating entities (HM Treasury Task Force, 1999).

**Figure 5. Medium-support Helicopter Aircrew Training Facility Contract Structure**



### Asset Company

The asset company is responsible for financing, designing, building, owning the facilities, leasing the land, purchasing the simulators, and purchasing the computer equipment. It is also the primary conduit for the financing liability. The primary contracting companies will act as sales agents; CAE will sell the simulators; and Vega will sell the computer equipment to the asset company.

The primary companies involved in the contract (CAE, Vega, Serco) are tied directly to CVS via equity investments made at project inception. The primary contractors, in concert with Charterhouse Capital, Inc., provided 20% of the required financing through equity (\$44 million). The major portion of the financing (80%) was



loans from a consortium of six banks, with HSBC as the leading bank (Symes, 2006). The asset company unifies the primary contractor's liabilities as a single entity, which is just a subdivision of CVS Aircrew. However, the division of asset and operating companies shields the MoD and contractor consortium from the liabilities. This model affords the primary contracting companies the opportunity to retain project ownership and yet minimize their exposure to debt risk.

The asset company, once fully developed, entered into a lease agreement with the operating company. Both companies are subdivisions of CVS. The lease agreement between the asset and operating companies is essentially a funds transfer to satisfy senior debt payments (bank loan) and distribute interest on dividends to the equity partners. The asset company is invisible to the MoD and operates independently of the operating company, but is connected to the MoD via liabilities documents discussed later.

### **Operating Company**

The operating company is the link between the contractor consortium and the MoD. It is the face of CVS and is responsible for soliciting business from either the MoD contract or third-party interests. The operating company is responsible for facilities maintenance, simulator maintenance, ground school administration, simulator scheduling and administration, and providing instructors. The operating company will subcontract the day-to-day services necessary to sustain operations. Unlike the asset company, the operating company may award fifty or more subcontracts for necessary services. For the MSHATF, the primary subcontracts were awarded to Serco, CAE, and associated partners for maintenance and manpower.

Additionally, the operating company is responsible for administering the contract with the MoD. Primary contract administration services are also subcontracted and include quality assurance, revenue collection, and dispute settlements. From the MoD perspective, this acquisition resembles a fee-for-service





contract because payments are made to a private company for services without ownership.

Finally, the operating company is also the agency responsible for soliciting third-party usage and allocating the resulting profit. Part of the revenue generated is used to offset the MoD cost, as per the primary contract. However, the remainder is pure profit because there are no additional costs incurred. The third-party usage charge is \$1,500 per hour or more, and the charge is traditionally booked in two-hour increments or greater (Symes, 2006). As discussed previously, this option could be quite lucrative to both the MoD and CVS.

### **Banks**

The banks entered into a credit agreement with the asset company to provide capital for 80% of the asset value. To provide the line of credit, the banks required a 20% equity participation and a “tripartite agreement” with the MoD and operating company. The bank consortium deemed it necessary to contractually allocate risk equitably to all parties. The asset company generates revenue from the lease agreement with the operating company. The operating company is bound by contract to the MoD to provide a service for a fee. However, by implementing a tripartite agreement, the MoD and the bank consortium become bound in the event the MoD exercises an option to exit the contract within the first 20 years of service (Symes, 2006). Additionally, the private companies must complete a detailed financial analysis to sell the concept to private banks. This detailed financial analysis and evaluation of risk required by the banks is essential to the growth of PFI projects.

### **Equity Shareholders**

The primary equity shareholders are the three contract companies (CAE, Vega, Serco) with Charterhouse Capital as a third-party interest. CAE holds the majority of equity interest (10%) with Serco trailing as the minority (1.8%) equity partner (McNaught, 2006).



The three contracting companies play an additional role as service providers over the life of the contract. The service package is critical to understanding value-for-money from the private company's perspective. Without the service package, there is no need for a long-term contract, and the arrangement is similar to an outright purchase. The contract length and service requirements are private industry's reward for risk incurred by providing the up-front capital. The mechanism that connects the service providers with the equity shareholders is the operating company. The operating company provides for services by entering into contracts with the equity providers for building maintenance, instructor pilots, and various services.

The risk associated with design and construction—as well as interest rate fluctuations—is assigned to the asset company. The asset company generates equity growth for the shareholders after bank interest payments are satisfied. The equity growth is independent of any fee-for-service contracts levied by the operating company. The value-for-money to the CVS consortium is the equity return from the long-term fee-for-service contracts.

### **Ministry of Defense (MoD)**

The MoD bears no liability for asset ownership, facility maintenance cost, procurement cost, etc., during or at the end of the contractually obligated period (initially 20 years). The service fee MoD pays to CVS, the operating company, is based on actual usage rates and is downward adjusted over time with offsets from third-party usage. In keeping with standard fee-for-service contract obligations, the MoD is penalized for scheduled time not used, early exit of the contract, and changes to training not specifically stipulated in the original contract. However, since the PFI is a service contract, the MoD bears no responsibility of ownership or requirement to purchase the assets at the conclusion of the contract.



## Risk Transfer

The transfer of risk from the public to private sector ensures the MSHATF project's value-for-money. The most significant level of risk transferred is in two categories: construction-project overruns and performance justification. Government procurement has a long-standing tradition of soliciting the lowest bid contract, not best value, often resulting in significant schedule slippage and cost overrun. The PFI/PPP model transfers the initial high-risk portion of the acquisition, where the large up-front capital requirement exists, to the private sector. The private sector has, over time, developed effective risk matrices and is efficient in dealing with this environment. Thus, the true value-for-money does not lie in a dollar-for-dollar financing comparison, but in the cost of risk avoided.

## Public-sector comparator Analysis

The MSHATF project, in keeping with MoD finance department regulations, was evaluated against a Public-sector comparator (PSC) designed exclusively to evaluate this project. The PSC and contractors independently evaluated the project on a full-cost basis—including cost of capital, physical construction cost, and risk incurred. The primary difference between the contractor evaluation and the PSC is the risk assignment at project inception. The most significant risks to be valued and added to the PSC were:

- Construction Overruns. The main risks that were not addressed in cost terms by a conventional fixed-price contract were planning risks and delay in entry into service. Because of the greater incentive to deliver on-time inherent in a PFI contract, it was assumed that any delay in entry into service would be significantly shorter under PFI than under conventional procurement.
- Performance Failures. Down time of the simulators was expected to be much less under the PFI than under conventional procurement because of the greater penalties/incentives under the PFI contract. (HM Treasury Task Force, 1999)



From the government perspective, the true value-for-money proposition is transferring project ownership to the private sector during high-risk evolutions. The private sector, in turn, solicits debt and equity providers to evaluate and enter into project ownership. Because of the number of private parties involved, the project is evaluated numerous times and must withstand a high level of financial inquiry. The primary reason for the difference in evaluation techniques is the different goals of the government and private industry. The former is concerned with reducing cost, while the latter is focused on maximizing profit. For these reasons, the MSHATF contract shifted the high-risk portion of the project to the private sector, but provided fiscal incentives for the private contractor to deliver on-target and on-price. Additionally, the nature of the project led to further risk sharing between the MoD and CVS. A break down of the risk-sharing matrix used for the MSHATF contract can be found in Appendix I (HM Treasury Task Force 22).

## Analysis and Results

The MSHATF contract was awarded in October 1997 at a value of \$605 million for the first 20 years of contract life (HM Treasury Task Force, 1999). The MoD evaluated several different PSC risk profiles. The MoD valued the contract between \$695 million to \$726 million. Both the PSC and contractor analysis assumed the same MoD utilization rates (80%), 66% capacity available for third-party usage, and a 6% discount rate provided by the treasury (HM Treasury Task Force, 1999). Ultimately, the PFI model proved to be the optimal financing mechanism, besting the PSC by a conservative 15% (Symes, 2006). However, future third-party sales may further offset the MoD's cost. This payment mechanism limits the potential cost to the MoD by setting their take-or-pay rate, but does not limit profit-sharing potential generated by third-party usage. Traditional military cyclic usage could be dampened by third-party revenue. This type of contractual obligation displays the potential value to the government involved in using private-sector financing techniques.



## Summary

The MSHATF project is an example of the build/own/operate, or COCO model. It is positioned at the right end of the risk spectrum in Figure 1 where risk and responsibility are transferred to the private sector. The contractor bears the entire risk burden and does not receive revenue until the project is effectively operating within specified tolerances. By placing all of the financial risk on the shoulders of the contractor, the government creates a strong incentive for the awarded contractor to consistently meet milestones and complete them at or below cost.

The government has demonstrated over time an inability to effectively mitigate risk, resulting in frequent project delays and cost overages. The MSHATF projects provide true value-for-money by shifting the risk burden to the contractor during early unpredictable phases such as construction. The private sector has been able to develop techniques to deal with risk so that the companies that are still in business are truly efficient risk managers. Finally, the MSHATF projects bundle a long-term service contract with the financing and construction efforts, providing a more holistic project approach.



## Conclusion

PFI can be a very attractive alternative to traditional public financing and procurement. Throughout this research, several themes are evident. These are similar to those found in an article by Andrew Kaye. In his November 2000 article, there are three high-level criteria for attracting private-sector participation in financing government acquisitions:

1. Achieving good value-for-money as compared to other procurement options,
2. Where workable service can be purchased with appropriate risk transfers and payment mechanisms,
3. Where there is a strong probability of negotiating a reasonable deal for both the public and private sectors in an acceptable time scale. (Kaye, 2000)

According to Serco's Vice President of Strategic Development, Simon Chapman, "The key to PFI is the acceptable transfer of risk to both sides. It is a mutual decision made by each side in the negotiation process" (Chapman, 2006). The public sector can benefit greatly by taking advantage of the ability of the private sector to manage risk.

Achieving good value-for-money or lifecycle costs can be very difficult. There are six primary drivers for value-for-money that is key to PFI/PPP contracts:

1. Risk transfer
2. Output base specification
3. Long-term nature of contracts
4. Performance measurement and incentives
5. Competition
6. Private Sector management skills (Kaye, 2000)



Critics of this method of financing cite that the government's low borrowing rate precludes other financing arrangements involving payments over long periods. They further point out that these arrangements are actually bad for the country because they add to the public debt. PFI proponents' counter argument is that these innovative financing arrangements transfer risk from the public sector to the private sector, cost overruns and schedule slips are far less frequent and less severe. Since private capital is invested and a return is not earned until the project is complete, experience proves that a preponderance of PFI projects are actually completed on-time and within budget. Further, cost estimates for many government procurement programs are inaccurate, and may be "low balled" to gain Congressional approval. While the project's cost is small, experience shows that cost growth is a reality, and cost overruns make even the most simple and repeatable programs more expensive. Therefore, the key issue is whether the efficiency gains of PPPs offset the higher cost of private-sector borrowing.

There is no question that the UK has placed strong reliance on PFI projects. There are even proposals that private financing be given priority over the use of public funds. The UK national security has benefited from PFI projects that have provided government capabilities that would not have been funded otherwise or whose funding would have precluded other projects. In a world of ever-tightening budgets, the US should at least examine this financing option to free-up budget dollars for cutting-edge development and procurement for tomorrow's Armed Forces.



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## Appendix : Risk Allocation Matrix MSHATF

<b>Risk</b>	<b>Borne by MoD</b>	<b>Borne by Contractor</b>
Risks in relation to the land on which the facility is to be built	<p>Ability to grant a leasehold interest in the site (determined before contract award)</p> <p>Obligations under the lease in respect of utilities, security etc.</p>	<p>Ability to obtain planning permission (obtained before contract award)</p> <p>Compliances with building regulations, CDM etc.</p> <p>Most risks in relations to utility failure etc. remain with the contractor despite MoD obligations under lease</p>
Delayed in-service date for the Merlin Mk 3 aircraft	MoD will pay Take or Pay amounts as contracted even if it does not yet require the training service	<p>Income above Take or Pay is still at risk</p> <p>In practice contractor and MoD should have agreed revised simulator timetable to suit both parties</p>
Availability of aircraft data and other intellectual property	MoD assisting contractor to obtain but no liability	Contractor responsible for obtaining what it need to fulfill the programme
Change	MoD pay for additional databases and for MoD-driven changes in aircraft specification after a freeze date	<p>Contractor pays for wide-spread changes in requirements (e.g. Federal Aviation Authority changes to simulator standards) and contractor-proposed changes</p> <p>Several changes known to be in the pipeline to be dealt with by the contractor at no charge to MoD</p>
Political Risk	<p>MoD meets costs if the facility is sequestered in a crisis</p> <p>Take or Pay commits MoD to certain usages even if requirements change</p>	Contractor is exposed to changes in income above take or Pay resulting from changes in the MoD requirement (e.g. reductions in crew numbers)



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- Collaborative IT Tools Leveraging Competence

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