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## THURSDAY SESSIONS VOLUME II

### **Public Private Business Models for Defence Acquisition**

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## Panel 12. Assessing the Role of Public-Private Partnerships in DoD Logistics and Acquisition

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Thursday, May 15, 2014	
9:30 a.m. – 11:00 a.m.	<p><b>Chair: Lorna B. Estep</b>, Deputy Director of Logistics, Air Force Materiel Command</p> <p><b><i>Critical Choices in a Time of Austerity</i></b> Lou Kratz, Lockheed Martin Bradd Buckingham, Lockheed Martin Bernie Kelleher, Lockheed Martin</p> <p><b><i>Public Private Business Models for Defence Acquisition</i></b> Thomas Ekström, Swedish Defence Research Agency</p> <p><b><i>DoD Lead System Integrator (LSI) Transformation—Creating a Model Based Acquisition Framework (MBAF)</i></b> Ron Carlson, Naval Postgraduate School Paul Montgomery, Naval Postgraduate School</p>



# Public Private Business Models for Defence Acquisition

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## Abstract

The purpose of the reported research was to “study, analyse, and evaluate Business Models (BMs) regarding how they can handle the new supply concept that a new logistical interface brings about, with a particular emphasis on the risk taking that is part of the business concept.” Based on an extensive literature review, a generic Public Private Business Model (PPBM) for defence acquisition was initially created.

In the next step, a multiple case study was performed in the UK. The PPBM was instrumental in discovering internal and external misalignments. The internal misalignments are PPBM configurations where the building blocks are working against each other. The research has revealed examples where the mitigation of operational risk in the supply and support chains creates new risks in other building blocks. An external misalignment occurs when a PPBM configuration works against, for example, the strategy that it is intended to implement. The research has revealed examples where there is a risk that the PPBM configuration is detrimental to the overarching strategy, for example, transferring risk to the private sector or incentivising industry to enhance performance. Hence, the PPBM ought to be useful to identify and eradicate negative patterns and to identify and reinforce positive patterns.

## Introduction

Since the ending of the Cold War, the defence sector, particularly the areas of military logistics and defence acquisition, has been undergoing a comprehensive transformation. There are several factors that explain this transformation: changes in defence and security policies for nations and organisations; reductions in defence expenditure; participation in Peace Support Operations (PSOs); Lessons Learned (LL) from these operations, especially in the area of logistics; revolutionary development in the area of Information and Communication Technology (ICT); emergence of novel Commercial Best Practises (CBPs) in the areas of business and business logistics; and changes in the legislation regarding the conduct of public procurement, at least in Europe.

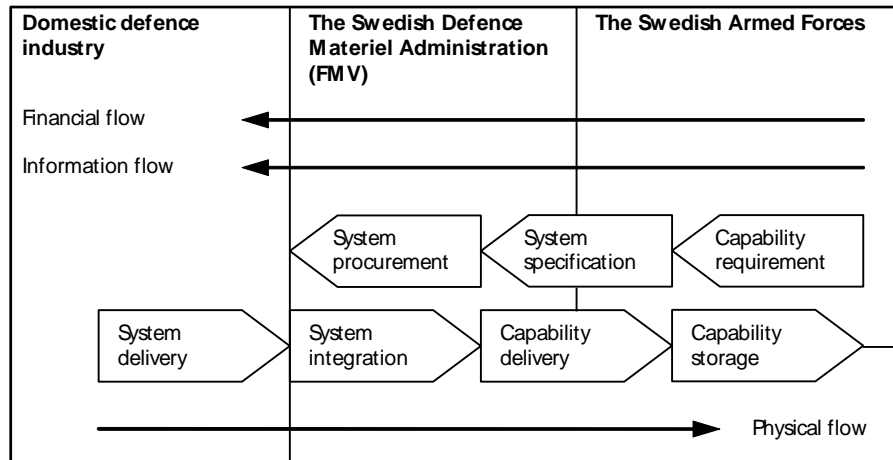
In military logistics, the relatively easily described static supply and support chains of the Cold War Era, designed for military units that stood in preparedness, Just-in-Case (JIC), of full-scale military conflicts in Europe, are now being substituted for flexible, dynamic operational supply and support chains, designed for military units that are deployed on PSOs around the globe. Hence, new types of missions have to be provided for. As a consequence, new military concepts have to be considered; new ICT is being implemented; and new CBPs are being evaluated, adapted and adopted; in order to enhance performance and ensure Value-for-Money (VfM).

In defence acquisition, the single Business Model (BM) of the Cold War Era, i.e., procurement of equipment, is being replaced by a spectrum of emerging BMs, ranging from the traditional procurement of equipment, via acquisition of equipment and support, to acquisition of availability and capability, i.e., acquisition of performance. Consequently, new CBPs are being evaluated, adapted and adopted; Commercial and Military-Off-The-Shelf



(COTS and MOTS) products and services are being utilised; and Public Private Participation, Cooperation (PPC), and Partnerships (PPPs) are being investigated and initiated; in order to enhance performance and ensure VfM, while simultaneously mitigating operational risk in the supply and support chains.

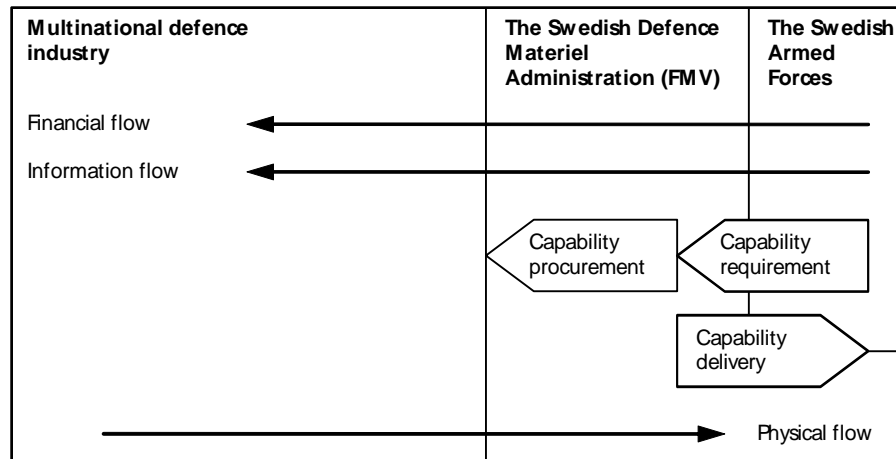
In Sweden, the single BM of the Cold War Era resulted in a static, closed military supply chain, which is schematically illustrated in Figure 1.



**Figure 1. The Static, Closed Military Supply Chain of the Cold War Era**  
(Ekström, 2012, p. 29)

Figure 1 illustrates the military supply chain, including the actors, their relationships and their main areas of responsibilities. Figure 1 also illustrates the principal flows in the supply chain, but only the main directions of the principal flows are depicted. In reality, there would be information flowing in both directions, and there would also be a reverse physical flow, representing, e.g., the return of damaged equipment and a reverse financial flow due to penalty mechanisms.

After the ending of the Cold War, the single supply chain illustrated in Figure 1 is still valid, but only as one extreme on an entire spectrum of emerging supply chains. Figure 2 illustrates the other extreme of this emerging spectrum.



**Figure 2. One Extreme of the Dynamic, Open Military Supply Chain of the Post-Cold War Era**  
(Ekström, 2012, p. 30)

In the other extreme of the emerging spectrum of new BMs, capability is being delivered directly to the Swedish Armed Forces by the multinational defence industry. Between the two extremes are Contractor Logistic Support (CLS) arrangements and Performance Based Contracts (PBC), e.g., Contracting-for-Availability (CfA), and “Power-By-the-Hour” (PBH) arrangements.

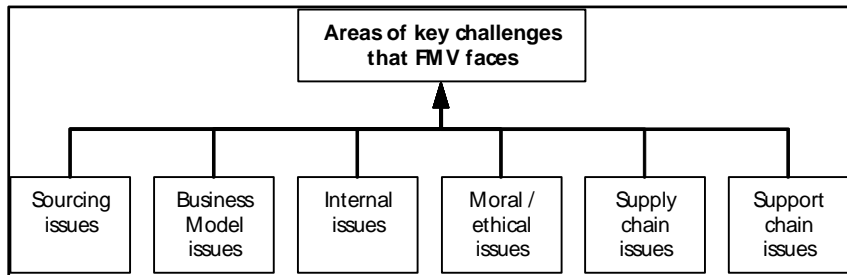
Without prioritisation or any other particular relative order, the drivers for change for the Swedish defence acquisition after the ending of the Cold War can be summarised as

- Significant changes in national security and defence policies;
- Shift from preparations for war in Europe to participation in PSOs;
- The on-going transformation of the Armed Forces;
- Budgetary reductions, and/or transfer of resources from support to operations;
- Changes in legislation regarding the conduct of public procurement;
- LL from the first Gulf War;
- Revolutionary development in the area of ICT;
- Emergence of new CBPs in business logistics;
- Instructions from MoD to utilise OTS to a larger extent;
- Emergence of international cooperation in the areas of defence acquisition and strategic transportation; and
- Emergence of an array of potential types of Public Private Participation.

In combination, these drivers for change of defence acquisition constitute the condensed background to the reported research.

This paper reports on some of the results of a research project that was commissioned by FMV, the Swedish Defence Materiel Administration, that is, the Swedish DPA. The research purpose was to “study, analyse, and evaluate Business Models regarding how they can handle the new supply concept that a new logistical interface brings about, with a particular emphasis on the risk taking that is part of the business concept.”

Based on interviews performed within FMV, the Post–Cold War challenges facing the Swedish Armed Forces and FMV can be summarised as: To perform new types of activities; In remote locations; In cooperation with new partners; In novel ways; Using contracts rather than relying on legislation; While at the same time spending less money; By utilising OTS products and services, capitalising on new ICT, adapting and adopting new CBP, using PPC, and international cooperation. Based on divisive and agglomerative Qualitative Cluster Analysis (QCA) of the results of the interviews, six potential research problem areas for Swedish defence acquisition were identified: Sourcing issues; Business Model issues; Internal issues; Moral and ethical issues; Supply chain issues; and Support chain issues. These areas of key challenges faced by FMV are illustrated in Figure 3.



**Figure 3. Areas of Key Challenges That FMV Faces**  
(Ekström, 2012, p. 39)

The areas of key challenges that FMV faces, that is, the potential research problem areas, were compared to the research purpose which enabled the formulation of three Research Questions (RQs):

- Research Question 1: How can a generic Business Model for a non-profit, governmental, Defence Procurement Agency be described?
- Research Question 2: Which strengths and weaknesses do different Business Models have in the context of defence acquisition?
- Research Question 3: Which risks are associated with different Business Models in the context of defence acquisition?

The research commissioned by FMV has been reported in a licentiate<sup>1</sup> thesis (Ekström, 2012), which can be obtained through the author, or accessed through the Internet.<sup>2</sup> The aim of this paper is to demonstrate how a generic PPBM for a non-profit, governmental, DPA can be described, and to illustrate how the PPBM can be used as an analysis tool and which types of results that can be produced. The main focus of the paper is on current practical problems, methodology and findings with relevance for practise, rather than on theoretical gaps, theoretical framework and contributions to theory. An earlier version of this paper was presented at the 29th International Symposium on Military Operational Research (29 ISMOR), in the UK.

<sup>1</sup> The Licentiate of Engineering, which is an intermediate postgraduate degree used only in a few countries, among them Sweden and Finland, is an academic step halfway between a MSc and a PhD.

<sup>2</sup> <http://lup.lub.lu.se/luur/download?func=downloadFile&recordId=3051798&fileId=3051805>

## Theoretical Frame of Reference

The research purpose was decomposed into six distinct parts, and for each part a relevant area of theory was identified, which is illustrated in Table 1.

**Table 1. The Connection Between the Research Purpose and Different Areas of Theory**

(Ekström, 2012, p. 69)

Decomposed Research Purpose	Relevant area of theory
study, analyse, and evaluate <b>business models</b>	Business Models
regarding <b>how they can handle</b>	Performance Measurement
the new <b>supply concept</b>	Military Logistics
that a new <b>logistical interface</b> brings about	Public Private Participation
with a particular emphasis on the <b>risk taking</b>	Supply Chain Risk Management
that is part of the <b>business concept</b>	Defence Acquisition

Using constructs from Business Model (BM) theory, Public Private Participation theory, defence acquisition theory and practise, and military logistics theory and practise; a generic Public Private Business Model (PPBM) for defence acquisition, i.e., a model for design and/or analysis of defence acquisition projects, was developed. In Table 2, the key constructs from the different areas of theory are illustrated.

**Table 2. Key Constructs From the Theoretical Frame of Reference**

(Ekström, 2012, p. 16)

Business Models	Defence Acquisition	Public-Private Participation	Military Logistics
The Business Model Canvas (Source: Osterwalder and Pigneur, 2010)	The spectrum from public provision to outright privatisation (Source: e.g. Grimsey and Lewis, 2004, p 54)	Value-for-Money (VfM) (Source: e.g. Grimsey and Lewis, 2004, p 135)	Functions (Source: e.g. Foxton, 1994, p 11)
The Business Model building blocks (Source: Osterwalder and Pigneur, 2010, pp 16-17)	Off-The-Shelf (OTS) (Source: e.g. Lawrence, 2009, p 167)	Bundling (sharing of responsibilities) (Source: Grimsey and Lewis, 2004, p 129)	Principles (Source: e.g. Foxton, 1994, pp 3-7)
	Types of public private contracts (Source: e.g. Sols et al. 2007)	Modes of delivery (Source: e.g. Grimsey and Lewis, 2004, p 54)	Alternatives (Source: e.g. Kress, 2002, p 10)
	(Defence acquisition transition staircase) (Source: The UK MoD, 2005c, p 135)		Distribution channels (Source: The author)
	(Defence Lines of Development) (Source: The UK MoD, 2011d)		

The key theoretical constructs that were used from BM theory in the creation of the generic PPBM for defence acquisition were the “Business Model Canvas” (Osterwalder and Pigneur, 2010) and the nine BM building blocks (i.e., “Customer Segments,” “Customer Relationships,” “Channels,” “Value Propositions,” “Key Activities,” “Key Resources,” “Key Partnerships,” “Revenue Streams” and “Cost Structure”). The PPBM is based on the Business Model Canvas, which is illustrated in Table 3.

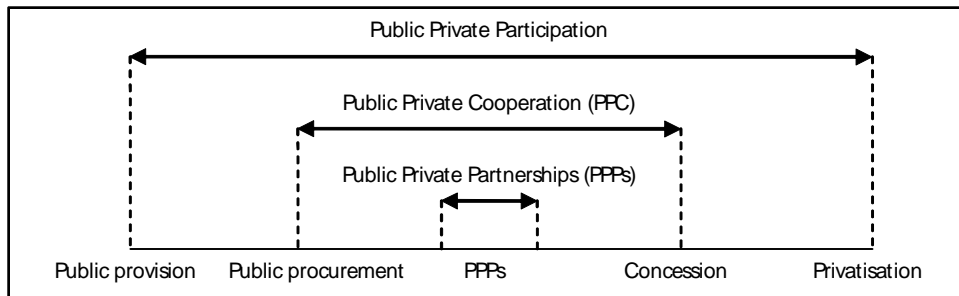


**Table 3. The Business Model Canvas**  
(Osterwalder and Pigneur, 2010, p. 44)

<b>Key Partnerships</b> "The network of suppliers and partners that make a business model work".	<b>Key Activities</b> "The most important things a company must do to make its business model work".	<b>Value Propositions</b> "The collection of products and services that create value for a specific customer segment".	<b>Customer Relationships</b> "The types of relationships that a company establishes with specific customer segments".	<b>Customer Segments</b> "The various groups of people or organisations that an enterprise aims to reach and serve".
	<b>Key Resources</b> "The most important assets required to make a business model work".		<b>Channels</b> "How a company communicates and reaches its customer segments to deliver a value proposition".	
<b>Cost Structure</b> "All costs incurred to operate a business model".		<b>Revenue Streams</b> "The cash a company generates from each customer segment".		

From defence acquisition theory, the following key theoretical constructs were used: the spectrum from public provision to outright privatisation (i.e., public provision, traditional public procurement, outsourcing, contracting out, Public Private Partnerships (PPPs) and Private Finance Initiatives (PFIs), franchising, concessions, Joint Ventures (JVs) and outright privatisation (Grimsey & Lewis, 2004, p. 54); Off-The-Shelf (OTS) products and services (including Commercial-Off-The-Shelf, COTS, and Military-Off-The-Shelf, MOTS; Lawrence, 2009, p. 167); and different types of public private contracts (i.e., Firm Fixed-Price, FFP, Fixed-Price Incentive, FPI, Cost-Plus Incentive Fee, CPIF, Cost-Plus Fixed Fee, CPFF, or Performance Based Contracts, PBC; Sols et al., 2007).

The area of Public Private Participation (including Public Private Cooperation and Public Private Partnerships) contributed with the following key theoretical constructs: Value-for-Money, VfM (including competition, risk transfer and the Public Sector Comparator, PSC; Grimsey & Lewis, 2004, p. 135); bundling (which is taken to mean the sharing of responsibilities for the following activities: Design (D), Finance (F), Buy (B)/Rent (R)/Lease (L), Construct (C) (Build (B)), Develop (D), Own (O), Operate (O), Manage (M), Maintain (M) and Transfer (T); Grimsey & Lewis, 2004, p. 129); and modes of delivery (which is taken to be the same spectrum as the spectrum from public provision to outright privatisation, less public provision and traditional public procurement; Grimsey & Lewis, 2004, p. 54). Public Private Participation is considered by the author to encompass Public Private Cooperation (PPC), which in turn comprises, e.g., Public Private Partnerships (PPPs). The relationships between these different constructs are illustrated in Figure 4.



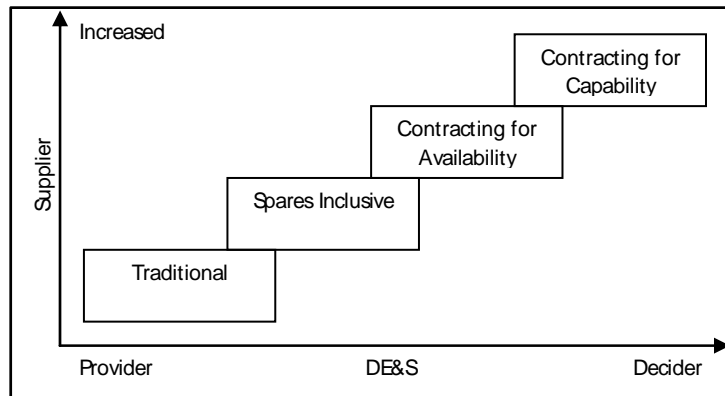
**Figure 4. The Relations Between Public Private Participation, Cooperation, and Partnerships**  
(Ekström, 2012, p. 111)

PPC is the umbrella term used by the Swedish Armed Forces and FMV to describe different forms of inclusion of the private sector in the delivery of products and services to the Armed Forces. PPC encompasses Contracting out of services, Alternative financing solutions and Partnership solutions. Contracting out of services is made up of facility management, Contractor Support to Operations (CSO) and outsourcing. Alternative financing solutions include leasing and Private Finance Initiative (PFI) solutions. Partnership solutions are project alliances and strategic partnerships, including Public Private Partnerships (PPPs).

From the area of military logistics the following key theoretical constructs were used: functions (i.e., supply, support, and transportation and movements; Foxton, 1994, p. 11); principles (i.e., foresight, economy, flexibility, simplicity, and cooperation; Foxton, 1994, pp. 3-7); alternatives (acquire it in the theatre, bring it to the theatre, and/or transport it to the theatre afterwards; Kress, 2002, p. 10); and distribution channels (i.e., supply chain for overseas operations, supply chain for domestic training and exercises, support chain for overseas operations and support chain for domestic training and exercises).

In addition to the key theoretical constructs from the area of defence acquisition, two constructs from UK defence acquisition practise has also been used in the PPBM: the defence acquisition transformation staircase and the components of military capability, i.e., Defence Lines of Development (DLoDs). The defence acquisition transformation staircase, which is illustrated in Figure 5, has four steps: “*Traditional*,” which involves procurement and support; “*Spares Inclusive*,” which includes procurement and “*Contractor Logistics Support*” (CLS); “*Contracting for Availability*” (CfA), i.e., the equipment is available when you require it; and “*Contracting for Capability*” (CfC), which means that the contractor will have to provide people to the front line, delivering the service (The UK MoD, 2005, p. 135). The UK DLoDs are Training, Equipment, Personnel, Information, concepts and Doctrine, Organisation, Infrastructure and Logistics (TEPID OIL<sup>3</sup>) (The UK MoD, 2011). In Table 2, these constructs from UK defence acquisition practise are presented in brackets.

<sup>3</sup>The UK capability components Training, Equipment, Personnel, Information, concepts and Doctrine, Organisation, Infrastructure and Logistics (TEPID OIL) are the equivalent of the US capability components Doctrine, Organisation, Training, Materiel, Leadership, Personnel, Facilities (DOTMLPF).



**Figure 5. The Defence Acquisition Transformation Staircase**  
(The UK MoD, 2005, p. 135)

The “*Business Model Canvas*” and the nine BM building blocks constitute the framework for the PPBM. The contents of the PPBM building blocks have, however, come from various other areas of theory and from practise. The generic PPBM consequently consists of numerous variables, which enables an array of possible configurations. In Table 4 the PPBM is illustrated.

**Table 4. A Generic Public Private Business Model for Defence Acquisition**  
(Ekström, 2012, p. 175)

<p><b>Key Partnerships</b> Spectrum of degree of Public buyer (decider) – Private supplier (provider) Cooperation (PPC): Contracting out of services (Facility Management, Contractor support to operations (CSO), Outsourcing), Alternative financing solutions (Leasing, PFI solutions), Partnership solutions (Project Alliances, Strategic Partnerships (PPPs)) Process for selection of partner Identity of partner Network of suppliers</p>	<p><b>Key Activities</b> Public buyer (decider) or private supplier (provider) responsibility, as well as Transfers (T) of responsibility, for activities such as: Design (D), Finance (F), Buy (B) / Rent (R) / Lease (L), Construct (C) / Build (B), Develop (D), Own (O), Operate (O), Manage (M), and Maintain (M) for products (equipment) and services (support).</p>	<p><b>Value Propositions</b> Two dimensions:  Equipment: Existing – Standard (OTS) – Adaptation – Foreign Development – Domestic Development  Support: Traditional – Contractor Logistics Support (CLS) – Contract-for-Availability (CfA) – Contract-for-Capability (CfC)</p>	<p><b>Customer Relationships</b> Spectrum of degree of compliance with – opposition to the user requirements: Colleague, Procurer, Challenger</p>	<p><b>Customer Segments</b> Section or department within the Armed Forces Permanent Joint Headquarters (PJHQ) or the Front Line Command (FLC) Or Service within the Armed Forces Or Branch, Corps, Regiment, or Military unit within the services</p>
	<p><b>Key Resources</b> "The most important assets required to make a business model work".</p>	<p>CfAs and CfCs will also influence most of the other Defence-Lines-of-Development (DLoDs): Training (T), Equipment (E), Personnel (P), Information (I), Concepts and Doctrine (D), Organisation (O), Infrastructure (I), Logistics (L)</p>	<p><b>Channels</b> Two dimensions: Type (Supply – Support); Destination (Overseas – Domestic): Overseas supply chain (operations) Overseas support chain (operations) Domestic supply chain (training and exercises) Domestic support chain (training and exercises)</p>	
<p><b>Cost Structure</b> Only different forms of the external costs (i.e. FFP, FPI, CPIF, CPFF, PBC) have been explicitly included. Internal costs are NOT included in this paper</p>		<p><b>Revenue Streams</b> "The cash a company generates from each customer segment" NOT included in this paper</p>		

The PPBM is useful for design and/or analysis of defence acquisition projects, i.e., in order to address RQ 1. However, in order to address RQs 2 and 3, that is, BM performance and risk, additional models for analysis were required.

Performance is defined as a combination of effectiveness and efficiency. Effectiveness is concerned with the goals of the contract, i.e., "if the contract did the right things" or "if the goals were reached." Efficiency deals with how the resources were used to reach the goals, i.e., "if the contract did the things right," or "if there was an optimum use of resources to reach the goals." The goal of a CfA acquisition project is explicitly to deliver the agreed upon system availability. Implicitly though, there is also the expectation that availability will be delivered "faster, cheaper, better" than if MoD had delivered the service, and that there will be VfM. Hence, the goals of the CfA acquisition projects are considered to be the delivery of agreed availability, reduced delivery time, reduced delivery cost, increased delivery quality and VfM. Using constructs from defence acquisition theory and Performance Measurement theory, a model for analysis of acquisition project performance was created. The model is presented in Table 5.

**Table 5. A Model for Analysis of Acquisition Project Performance**  
(Ekström, 2012, p. 180)

	Goals		Strengths	Weaknesses
Effective-ness	Availability target	Ops		
		T&E		
	Reduced delivery time	Ops		
		T&E		
	Reduced delivery cost	Ops		
		T&E		
	Increased delivery quality	Ops		
		T&E		
Efficiency	Monetary resources	Ops		
		T&E		

Using the model for analysis presented in Table 5, the strengths and weaknesses for the four effectiveness goals and the single efficiency goal (VfM) can be analysed for overseas operations (Ops) and domestic training and exercises (T&E).

Supply Chain risks and uncertainties are regarded as belonging to one of three types of risk: operational accidents, operational catastrophes and strategic uncertainties. The risk sources are either external to the supply chain (environmental) or internal to the supply chain (organisational or network-related, where the latter is either supply or demand risk). Using these descriptions of risk types and risk sources, i.e., constructs from Supply Chain Risk Management (SCRM) theory, a model for analysis of acquisition project risk was created. The analysis model is presented in Table 6.

**Table 6. A Model for Analysis of Acquisition Project Risks**  
(Ekström, 2012, p. 180)

Ops: Overseas operations T&E: Domestic Training and Exercises			Sources of supply chain risks and uncertainties			
			External		Internal	
			Environ-mental risks	Organi-sational risks	Network risks	
					Supply risks	Demand risks
Type and consequence of supply chain risks and uncertainties	Operational accidents	Ops				
		T&E				
	Operational catastrophes	Ops				
		T&E				
	Strategic uncertainties	Ops				
		T&E				

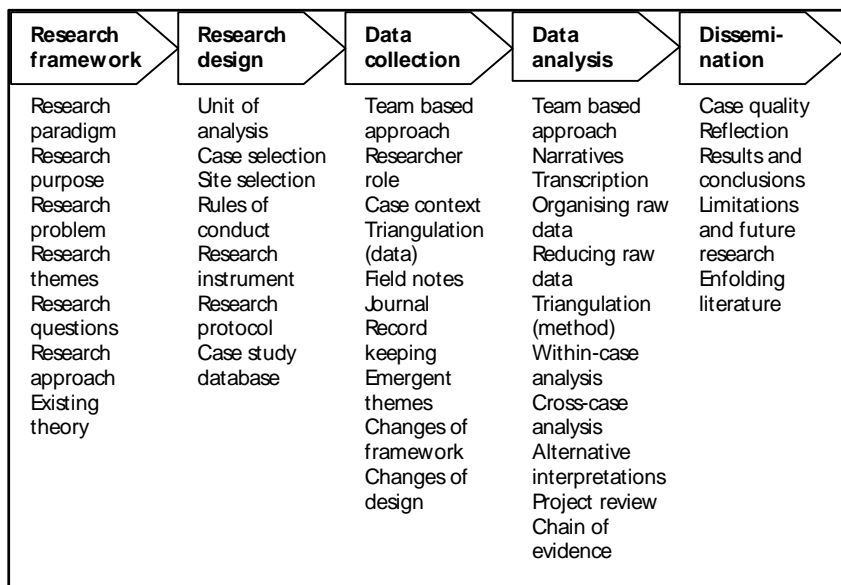
Using the model for analysis in Table 6, the different risk types can be analysed for overseas operations (Ops) and domestic training and exercises (T&E).

## Research Methodology

Regardless of the type of case study; qualitative or quantitative; or explanatory, exploratory or descriptive; “investigators must exercise great care in designing and doing case studies to overcome criticisms of the method” (Yin, 2003, p. 1). “Using case studies for

research purposes remains one of the most challenging of all social science endeavours” (Yin, 2009, p. 3).

Several, more or less elaborate, and more or less explicit, case study research methodologies, approaches, research process models, and/or frameworks have been suggested in the literature over the last two decades, ranging from a three-step rigorous case research approach (Näslund, 2008, p. 106), to an eight-step theory-building roadmap (Eisenhardt, 1989). A majority of the presented methodologies tend to have either four stages (e.g., Ellram, 1996; Riege, 2003; Paré, 2004; Meyrick, 2006), or five stages (e.g., Benbasat et al., 1987; Darke et al., 1998; Stuart et al., 2002; Cepeda & Martin, 2003; Seuring, 2008). The different methodologies are all sequential in nature, i.e., describe stages that have to precede subsequent stages, even if some authors acknowledge the possibility that some stages may be executed in parallel, rather than purely sequential. Some authors (e.g., Cepeda & Martin, 2003; and Yin, 2009, p. 1) also emphasise that case based research is an iterative, recursive process. Another common denominator is that most of the authors agree on three stages of the process, i.e., research design, data collection, and data analysis, even if they do not agree on names and contents for these three stages. The major disagreement between the different authors concerns whether or not there are stages before and after these three stages, and, if there are, what these stages should be called and what they should contain. Ekström et al. (2009) analysed 116 peer-reviewed articles dealing with quality criteria, methodologies, approaches, research process models, and frameworks for rigorous case based research; and, using a divisive and agglomerative Qualitative Cluster Analysis (QCA) approach, synthesised the results into a five-stage methodology for rigorous case based research design, conduct, analysis, and dissemination, which is illustrated in Figure 6.



**Figure 6. A Rigorous Case Based Research Methodology**  
(Ekström et al., 2009)

The five stages of the rigorous case based research methodology are research framework, research design, data collection, data analysis and dissemination. Of these five stages, research design, data collection, and data analysis will be briefly described in this paper.

According to Yin (2009, p. 30), “Selection of the appropriate unit of analysis will start to occur when you accurately specify your primary Research Questions. If your questions do not lead to the favouring of one unit of analysis over another, your questions are probably either too vague or too numerous.” The formulation of the primary RQ, i.e., RQ 1, led to the selection of Public Private Business Models (PPBMs) as the single, i.e., holistic (Yin, 2009, p. 50), unit of analysis, since it was decided that this unit of analysis would be best suited to answer the RQs. The selection of the PPBM as the unit of analysis is in line with the findings of Zott et al. (2010); “there is a widespread acknowledgement—implicit and explicit—that the Business Model is a new unit of analysis in addition to the product, firm, industry, or network levels; it is centred on a focal organisation, but its boundaries are wider than those of the organisation.”

To define the “unit of analysis” is difficult. However, things do not start to get really complicated until entering the quagmire regarding definitions of what a “case,” a “case study,” and “case study research” really is. “Part of the confusion surrounding case studies is that the process of conducting a case study is conflated with both the unit of the study (the case) and the product of this type of investigation” (Merriam, 1998, p. 27). A case has been proposed to be the “Object of study” (Stake, 1995, p. 2), “The unit of analysis” (Miles & Huberman, 1994, p. 25), or a “Bounded system” (Creswell, 2007, p. 73), which means that some commentators are of the opinion that there is no difference between the case and the unit of analysis; a notion that this author finds it hard to subscribe to. Furthermore, a case study is “not a methodological choice but a choice of what is to be studied” (Stake, 2000, p. 435), “both a process of inquiry about the case and the product of that inquiry” (Stake, 2000, p. 436), “a strategy of inquiry in which the researcher explores in depth a program, event, activity, process, or one or more individuals” (Creswell, 2009, p. 13), or “an empirical study that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident” (Yin, 2003, p. 13), depending on the author. “The basic idea is that one case (or perhaps a small number of cases) will be studied in detail, using whatever methods seem appropriate. While there may be a variety of specific purposes and Research Questions, the general objective is to develop as full an understanding of that case as possible” (Silverman, 2008, p. 126).

The following quote summarises the author’s understanding of what case studies are all about (Eisenhardt, 2002, pp. 8–9):

The case study is a research strategy which focuses on understanding the dynamics present within single settings. Case studies can involve either single or multiple cases, and numerous levels of analysis.” “Moreover, case studies can employ an embedded design, that is, multiple levels of analysis within a single study.” “Case studies typically combine data collection methods such as archives, interviews, questionnaires, and observations. The evidence may be qualitative (e.g., words), quantitative (e.g., numbers), or both. Finally, case studies can be used to accomplish various aims: to provide description, test theory, or generate theory.

After some deliberation, the case was decided to be a defence acquisition project.

Given the research problem, the research purpose, the RQs, the unit of analysis and the case; the potential sites for the reported research were limited, even in a global perspective. Only a handful of nations have come far enough in their development in order to provide the necessary data. Out of these few countries, the U.S. and the UK are probably the most relevant countries to study. The UK MoD was selected as the single site for data collection. A single site was selected because of the resource restrictions for this research



project. Because of the same limitations, a site in Europe was preferable because of the advantageous proximity to Sweden. The UK MoD was selected as the site for data collection since the UK is, arguably, exceptional in Europe in the sense that it has developed the furthest in the direction of contemporary trends (i.e., increasing effectiveness and efficiency through, e.g., outsourcing to the private sector, private sector financing and partnering with the private sector) and, presumably, has produced the most relevant lessons to be learned in these areas. The UK is also unique in Europe because of the multitude and accessibility of governmental evaluations and reports, and of academic research that has been performed and published, which provides ample opportunities for collection of secondary data to complement the primary data that, e.g., an interview study can produce. In comparison to the U.S., which has also come a long way in its transformational development, the scale in the UK is more reasonable and comparable to Sweden, and the driving forces behind change in the UK are likely to be more similar to Sweden than those in the United States. Consequently, the single site for the data collection was the MoD Defence Equipment & Support (DE&S), in Bristol, in the UK.

For the conducted research four cases, i.e., defence acquisition projects, were selected, i.e., a multiple-case design (Yin, 2009, p. 53). A multiple case study was selected because it was decided that it would increase the possibility of generalisability (Ellram, 1996), more specifically analytic, *not* statistical, generalisability (Yin, 2009, p. 38). Furthermore, because of limitations regarding resources, i.e., time and money, it was not possible to include more than four cases in the study. Because of the same restrictions, no pilot case was used. The cases were all current and retrospective in nature. For multiple-case studies literal or theoretical replication, not sampling logic is used (Yin, 2009, p. 54). The selection of cases can be regarded as literal replication, since the cases were expected to produce similar results, rather than contrasting results for anticipatable reasons. In summary, the case study is a holistic multiple-case study design, i.e., a Type 3 design (Yin, 2009, pp. 46-47). In Table 7 the central aspects of the research design are summarised.

**Table 7. Summary of Central Aspects of the Research Design**  
(Ekström, 2012, p. 52)

<b>Research questions</b>	RQ 1: How can a generic Business Model for a non-profit, governmental, defence procurement agency be described? RQ 2: Which strengths and weaknesses do different Business Models have in the context of defence acquisition? RQ 3: Which risks are associated with different Business Models in the context of defence acquisition?
<b>Unit of analysis</b>	Public Private Business Model (PPBM)
<b>Type of case study</b>	Qualitative, explanatory, holistic multiple case study
<b>Case</b>	Defence acquisition project
<b>Site</b>	MoD Defence Equipment and Support (DE&S), Bristol, UK

Case study evidence can come from many sources, e.g., documentation, archival records, interviews, direct observation, participant-observation, and physical artefacts (Yin, 2009, p. 99). In the reported research, interviews, archival records and documents were used. Primary data was collected through the interviews at DE&S. The interviews were performed on three visits to DE&S headquarters in 2010. On these visits four 90 minute interviews were conducted. The interviews were focused and semi-structured, not in-depth or structured (Yin, 2009, p. 107). In order to enable data triangulation, secondary data was also collected. The sources for secondary data included: archival data from governmental authorities in the UK, such as MoD (Ministry of Defence), HMT (Her Majesty's Treasury) and NAO (National Audit Office), and from prime contractors such as ALC, MBDA and Multipart



Defence; academic research reports from, e.g., Cranfield University, i.e., the Defence Academy of the UK; and peer-reviewed articles from several journals in the field of defence acquisition, military logistics, logistics, Supply Chain Management (SCM), Operations Management (OM), etc. Data triangulation is desirable in order to have multiple sources of data contribute to converging lines of inquiry.

Data analysis in case based research is complex and “The analysis of case study evidence is one of the least developed and most difficult aspects of doing case studies” (Yin, 2009, p. 127). Yin (2009, pp. 130–134) describes four general strategies for telling the story of the case study: relying on theoretical propositions; developing a case description; using both qualitative and quantitative data; and examining rival explanations. In the reported research a combination of three of these strategies was used: Theoretical propositions were formulated; case descriptions were developed; and rival explanations to findings were examined. The case descriptions were based on a descriptive framework, where the theoretical propositions provided the essential structure. Yin (2009, pp. 136–160) proposes five analytic techniques for analysing case study evidence: pattern matching, explanation building, time-series analysis, logic models and cross-case synthesis. In the reported research pattern matching, explanation building and cross-case synthesis were used. The RQs were used to structure the within-case analyses.

### **Summary of the Multiple Case Study**

The multiple case study is based on four UK defence acquisition projects: C Vehicle (Case A), STSA (Case B), HASP (Case C), and ADAPT (Case D). C Vehicles is the military abbreviation for the construction vehicles that are used by the military for engineering projects, equipment handling and material handling. The STSA (Short Term Strategic Airlift) was an acquisition project initiated in 1998 by the MoD in order to temporarily fill the predicted seven year gap between the ageing fleet of Lockheed C-130K Hercules and their intended replacements, the European Future Large Aircraft (FLA), i.e., the Airbus A400M. The HASP (Heavy Armour Spares Provisioning) contract is the direct succession to the earlier CRISP (ChallengeR 2 Innovative Spares Provision) contract. The CRISP and the HASP contracts both involved delivering spares to the Challenger 2 (CR2), which is the UK Main Battle Tank (MBT). The ADAPT (Air Defence Availability Project for Rapier) contract is the direct succession to the earlier TRADERS (The RAPier Direct Exchange of Repairable Spares) contract. The TRADERS and the ADAPT contracts both involved delivering spares to Rapier, which is the UK Air Defence System (ADS), i.e., a Surface-to-Air Missile (SAM) system. Some of the characteristics of the four cases are summarised in Table 8.



**Table 8. An Overview of Some of the Characteristics of the Cases**

(Ekström, 2010, p. 207)

Case	Equipment	Support	Affected DLoDs	<i>Nota bene</i>	Contract period
C Vehicle	Acquisition of new equipment: Adapted COTS construction vehicles	Provision of consumable and repairable spares, maintenance and repair: CfA (C Vehicle)	Training, Equipment, Personnel, Information and Logistics	PFI; Reached Initial Gate in 1999	2006-2021
STSA	Acquisition of new equipment: MOTS aircraft for strategic airlift	Provision of consumable and repairable spares, maintenance and repair: CfA (C-17)	Training, Equipment, Personnel, Information and Logistics	Leasing; Interim, short term solution	2001-2008
HASP	No acquisition of equipment	Provision of consumable spares: CfA (CR2 MBT)	Equipment, Information and Logistics	Interim, short term solution	2009-2011
ADAPT	No acquisition of equipment	Provision of consumable and repairable spares, maintenance and repair: CfA (Rapier SAM)	Training, Equipment, Personnel, Information, Organisation, Infrastructure and Logistics	Permanent, definitive solution until OSD	2007-2020

Two cases (HASP and ADAPT) do not involve acquisition of new equipment (i.e., complex materiel that requires support), only the provision of support (i.e., consumable and repairable spares, Maintenance, Repair and Overhaul (MRO) that is required in order to maintain the equipment at a certain level of availability) to already existing equipment.

While all four cases formally, as described by DE&S, include Contracting for Availability (CfA), one case (HASP), in practise, only comprises the provision of consumable spares.

Even though three of the cases (C Vehicle, STSA and ADAPT) affect several Defence Lines of Development (DLoDs), only one case (ADAPT) involves a written contract where other DLoDs than Equipment and Logistics, e.g., Training, are formally included.

Two cases (C Vehicle and STSA) involve alternative financing (PFI and leasing) solutions.

Two cases (STSA and HASP) are examples of comparatively short-term, interim solutions, initially intended to be replaced by longer term, permanent solutions.

One case (ADAPT) is an example of a permanent, definitive solution, intended to be in place until the Out-of-Service-Date (OSD) of the system that it supports.

## Results and Implications for Practise

The multiple case study demonstrated that the generic PPBM is useful in order to describe defence acquisition projects. The model has also demonstrated that it is useful in order to analyse acquisition projects, including performance and risk. In Table 9, the BM configurations in the four cases are illustrated.

**Table 9. The Business Model Configurations in the Four Cases**  
(Ekström, 2010, p. 322)

Business Model Building Block		Case A: C Vehicle	Case B: STSA	Case C: HASP	Case D: ADAPT
Customer Segments		The British Armed Forces	The Royal Air Force (RAF)	The British Army	The Royal Artillery; The Territorial Army
Customer Relationship		Procurer	Challenger	Procurer	Procurer
Channels	Overseas supply chain	Yes	Not applicable	Yes	Yes
	Overseas support chain	Yes	Not applicable	No	Yes
	Domestic supply chain	Yes	Not applicable	Yes	Yes
	Domestic support chain	Yes	Not applicable	No	Yes
Value Proposition	Equipment	Adapted COTS	Standard MOTS	No new acquisition	No new acquisition
	Support	CfA	CfA (MOTS)	CfA	CfA
	Included DLoDs	Training, Equipment, Personnel, Information and Logistics	Training, Equipment, Personnel, Information and Logistics	Information and Logistics	Training, Personnel, Information, Organisation, Infrastructure, and Logistics
	Other affected DLoDs	None	None	Equipment	Equipment
Key Activities	Private sector responsibility	Finance – Buy – Own – Operate – Manage – Maintain, (FBOOMM)	Finance – Own – Maintain, (FOM)	Finance – Buy – Own – Transfer, (FBOT)	Design – Buy – Operate – Manage – Maintain, (DBOMM)
	Public sector responsibility	Design	Design – Lease – Operate – Manage	Design – (Own)	Finance – Own
Key Partnerships	PPC	Alternative financing solution (PFI)	Alternative financing solution (Leasing)	Contracting out of services (outsourcing)	Partnership solution (strategic partnership)
	Selection of partner	Through competition	Through competition	Prolongation of existing contract	Prolongation of existing contract
	Prime contractor	ALC	Boeing (via FMS)	Multipart Defence	MBDA
	Sub-contractors	Multipart Defence	None	None	Multipart Defence
	Other important actors	Consortium of banks (PFI)	The US DoD, USAF and LSE	OEMs	None
Key Resources (Not included in this paper)					
Revenue Streams (Not included in this paper)					
Cost Structure (Only external costs included in this paper)		Firm Fixed Price (FFP)	Cost Plus Fixed Fee (CPFF)	Cost Plus Incentive Fee (CPIF)	Fixed Price Incentive (FPI)

The reported research has demonstrated that a generic Public Private Business Model (PPBM) can be created and successfully used in the area of defence acquisition. More specifically, the research has demonstrated that a PPBM for a non-profit, governmental, Defence Procurement Agency (DPA) can be described by using the



“Business Model Canvas” construct and its nine building blocks as a point of departure and adapting the contents of the building blocks to the context. The research has demonstrated that by describing the building blocks with constructs from defence acquisition theory, Public Private Participation theory, military logistics theory, defence acquisition practise and Public Private Participation practice, a generic PPBM for defence acquisition can be created.

The research has demonstrated that the PPBM can be used in practise, to describe and evaluate the underlying BMs of past and current defence acquisition projects, even though they were not designed based on a BM construct. The conclusion is that the PPBM would be well suited also for designing the BMs of future defence acquisition projects.

The PPBM has demonstrated its usefulness for identifying how the implementation of a solution to problems in one building block can lead to new problems in other building blocks. Of particular interest in this respect is the implementation of the Joint Supply Chain (JSC) concept in order to remedy problems with theft, fragmentation (i.e., multiple actors, with varying roles and responsibilities at different nodes in the military supply chain) and operational planning at the operational level. The JSC includes a logistics Consolidation Point (CP), called the Purple Gate (PG) and a Coupling Bridge (CB); and contractors are not allowed into the JSC, i.e., not beyond the PG. The PPBM was instrumental in the discovery that the JSC concept, which was implemented in order to remedy three problems at the operational level in the military supply chain, while successfully addressing these problems, simultaneously created problems at the strategic level in other areas concerning, e.g., private sector ownership and risk transfer to the private sector.

The above is an example of a potential misalignment in that particular PPBM, i.e., that specific configuration of building blocks. Based on the multiple-case study, the PPBM has unveiled no less than three potential misalignments. In addition to the potential misalignment between the JSC and private sector ownership and risk transfer to the private sector, the research has also discovered potential misalignments between Performance Based Contracts (PBCs), such as Contracts for Availability (CfAs), and traditional price agreements, i.e., Fixed-Price Contracts and Cost-Plus Contracts; and between the JSC and CfAs. The common denominator for these prospective mismatches between PPBM building blocks is that the implementation of an innovation in one building block, intending to, e.g., solve problems at the operational level (e.g., the JSC) or implement ideas from the strategic level (e.g., CfAs), has created unforeseen problems in other building blocks, at other levels. Hence, the PPBM has demonstrated its usefulness for discovering misalignments in defence acquisition projects after the fact. More importantly, the PPBM has also indicated its potential usefulness for investigating consequences, positive and negative, in other building blocks before implementing innovations in defence acquisition projects, thus potentially allowing reinforcement of positive consequences, and elimination of negative consequences.

The PPBM demonstrated its usefulness as a vehicle to identify risks that are to be associated with particular PPBMs, i.e., specific configurations of the contents in the different building blocks. Above, the potential misalignment between the JSC and CfAs was referred to. In addition to the potential misalignment, there is also a risk associated with PPBMs that include the combination of the JSC and a CfA. The research suggests that there is a risk that the JSC will render the CfA meaningless for overseas operations, since one of the consequences of the JSC is that it will not be possible for a contractor to deliver availability to overseas operations. Hence, similarly to what has been the described above, the PPBM has demonstrated its ability to serve as a tool for identifying risks *after* the fact, and indicated its potential usefulness for identifying risks *before* the implementation of new BMs.



Among other new developments, the UK Defence Industrial Strategy (DIS; UK MoD, 2005) relaxed the requirement for competition in defence acquisition, and opened up for other forms of selection of prime contractors. According to PPP theory, competition and risk transfer are the two most important prerequisites of Value-for-Money (VfM). Hence, there is a misalignment between current UK defence acquisition practise and PPP theory. CfAs are supposed to incentivise industry to enhance system availability. However, they are not necessarily always accompanied by contracts based on performance agreements, i.e., PBC. Instead, they are still often based on traditional pricing agreements. Consequently, there is a potential misalignment between the ambitions behind CfAs at the strategic level, and the practical implementation of these ideas into defence acquisition contracts at the operational level.

The existence of the PG in the JSC prohibits the contractor from delivering availability to the Joint Operations Area (JOA). Consequently, the PG makes it impossible to fulfil this aspiration of the CfA. Furthermore, because of the PG, a contractor cannot be expected to reduce delivery times to operations. This restriction is not compatible with the overall goal to reduce delivery times. In essence, problems in the military supply chain at the tactical and operational levels appear to have been solved at the expense of the implementation of ideas from the strategic level regarding effective and efficient defence acquisition. Hence, for overseas operations there is a potential misalignment between the limitations of the PG and the ambitions of the CfA. The PG in the JSC leads to another potential misalignment. In cases where the private sector owns a piece of equipment, despite the fact that ownership remains with the private sector even after passing the PG, risk taking cannot be assumed by the contractor, since the contractor has no influence over the equipment after that node in the chain. Consequently, the implication of the introduction of the PG into the JSC is that, whatever the formal contract states, in practise there cannot be any transfer of risk beyond the PG. In PPP theory, the transfer of risk is one of the two most important determinants of VfM. There is a potential misalignment in the combination of the PG and private sector ownership of equipment, since it is far from clear how private ownership of equipment should be handled in the JSC. It is also a potential misalignment with the overall expectation that PPPs will involve a great deal of risk transfer to the private sector.

The research has revealed three potential generic problems concerning PBC in the area of defence acquisition: a potential “*definition problem*” regarding what it is that should be measured; a potential “*measurement problem*” regarding how to measure; and a potential “*comparison problem*” regarding with what to compare measurements.

The potential definition problem (i.e., what to measure) is twofold. It is not clear if it is the acquisition of equipment, the provision of support, or the combination of the two, which is supposed to be “faster, cheaper, better,” when responsibility is outsourced to a contractor. In other words, it is not clear in which stage of the capability lifecycle that improvements should be delivered. In addition, the notion of CfA is not crystal clear. For equipment and support, availability refers to system readiness in theatre, i.e., operational availability. For very large strategic airlift resources availability refers to the number of flying hours per time unit, e.g., month or year, which does not say anything about the availability calculated as a probability at a certain point in time. For spares, availability can apparently refer to the existence of spares on the contractor’s shelves when the spares are required, regardless of the fact that there will be a substantial delay before the spares reach, e.g., the theatre. The research suggests that performance must be explicitly specified for any PBC in order to avoid any unnecessary problems with interpretations.



The potential measurement problem (i.e., how to measure) arises as a consequence of the fact that it is not clear when, where and how availability should be measured; and that it is not clear how changes in speed of delivery, cost of delivery and quality of delivery should be measured. Because of the PG and the JSC, it is not clear when, where and how system readiness (operational availability) should be delivered for overseas operations by the contractor. The existence of the PG in the JSC prohibits the contractor to deliver availability to the JOA. Furthermore, there is an increased complexity in defence acquisition, where more and more elements of capability are being outsourced, which means that a CfA can comprise several DLoDs. Consequently, it becomes increasingly difficult to measure the performance of the delivery.

The potential comparison problem (i.e., *with what* to compare) is constituted by the ambiguousness regarding with what to compare the measurements. It is not clear if the measurements of availability, speed, cost and quality should be compared to the past, present or future (enhanced) ability of DE&S. If it is enough for the contractor to be just faster, cheaper and better than what MoD was at the time of the negotiations with the contractor, or could be at another point in time, or if the contractor should reach a specified target, or improve by a specific percentage per annum, appears to be an unresolved issue in some contracts. Consequently, there appears to be a potential comparison problem in some contracts.

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