



The Cost of Defence

ASPI Defence Budget Brief 2009-10

Seventy-two million, nine hundred & ninety thousand, three hundred & seventy-five dollars & thirty-four cents per day.

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Cover graphic courtesy of Department of Defence

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Note on title:

The figure of \$72,990,375.34 represents one three-hundred-and-sixty-fifth of reported Total Defence Funding for financial year 2009–10. This does not include funds appropriated to the Defence Housing Authority, those administered by Defence for military superannuation schemes and housing support services, nor the additional funds provided directly to the Defence Materiel Organisation.

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EXECUTIVE DIRECTOR'S INTRODUCTION

This is ASPI's eighth annual Defence Budget Brief. Our aim remains to inform discussion and scrutiny of the Defence budget and the policy choices it entails.

As has been the custom in the past, we explore new areas in this year's brief. Two entirely new sections have been added; *Australian Aid*, which explores Australia's foreign aid program, and *The Impact of the Global Financial Crisis*, which examines the potential consequences of the present crisis for Australia's security. In addition, the existing *Defence Economics* section has been expanded to cover regional defence economic trends and our usual section on Defence Management has been given over to the recently announced *Strategic Reform Program*.

But perhaps the most important innovation in this year's brief is the replacement of our usual *ASPI Top Twenty Projects* with a more in-depth examination of nine selected projects that we think have important lessons for future defence acquisitions. This new section, called *Selected Major Projects*, contains articles from our colleagues at the Australian Defence Magazine, Gregor Ferguson and Tom Muir. This new section was conceived and edited by ASPI's Andrew Davies.

Finally, the not inconsiderable task of preparing the document for publication has been ably taken care of by Janice Johnson and Zoe Spinocchia. Many others have helped by providing comments, offering advice, and checking facts. Our thanks go out to them all.

Also, Defence was kind enough to look over a preliminary draft of this brief and provide valuable comments. This helped clarify some important points and resulted in improved accuracy in many areas. Of course this does not in any way imply that Defence endorses this document or even supports its conclusions.

My colleague Dr Mark Thomson, who is the Manager of ASPI's Budget and Management Program, has once again pulled together the brief in the short time available. For this I extend my sincere thanks. As always, responsibility for the judgements contained herein lie with Dr Thomson and me alone.

Lastly we should acknowledge that we at ASPI are not disinterested observers of the Defence budget. Our funding from government is provided through Defence at the rate of seven thousand, eight hundred and twenty-seven dollars and forty-five cents (\$7,827.45) per day. Details can be found in our 2007-08 Annual Report.

Peter Abigail
Executive Director

EXECUTIVE SUMMARY

Budgets are important because words are cheap. It is only by seeing where money actually goes that a government's true intentions are known.

It's disappointing, therefore, that 'the most comprehensive White Paper of the modern era' has been followed by the least comprehensive Defence budget papers of the past decade. Between the White Paper and the Defence budget papers we are offered only the barest details of how the government will fund its expansive plans for the defence force. Despite claiming to have a 'fully costed' and 'affordable' financial plan stretching twenty-one years out to 2030, actual funding has only been disclosed for the first four.

Mindful of the White Paper's exhortation that '[t]axpayers and their elected representatives should have a clear idea of where their defence dollars are going' we have done our best to fill in the gaps. Our best estimate is set out below.

A new funding model

It was on 2 May 2009 that the Prime Minister stood on the wharf at Garden Island, with a frigate for backdrop, and released the long awaited 2009 Defence White Paper, *Defending Australia in the Asia Pacific Century: Force 2030*.

Central to the ambitious plans laid out in that document was a new funding model that had three essential elements: 3% real annual growth in the Defence budget to 2017-18, 2.2% real annual growth in the Defence budget from 2018-19 to 2030, and 2.5% fixed indexation to the Defence budget from 2009-10 to 2030. In addition, Defence was directed to undertake a Strategic Reform Program to free-up \$20 billion of savings for redirection to priority areas.

On 12 May 2009, the Treasurer stood at the dispatch box and tabled a Budget which reneged on the commitment the Prime Minister had made only ten days earlier. Not only were the benefits of the new indexation regime deferred by four years, but \$2 billion of existing spending was cut from the next four years and deferred into the future, as was \$1 billion from 2015-16 and \$500 million from 2016-17. The deferral of indexation funding is particularly important because it's mainly the new indexation that provides extra money.

As best we can estimate (the budget papers do not disclose the total size or timing of the deferrals), around \$8.8 billion of funding has been taken from the first six years of the Defence budget. Of this amount, some money is returned in the last three years of the forthcoming decade and some is deferred into the next decade. We cannot say how much falls into each category.

It is no accident that the deferrals push spending to the other side of the tipping point where the government's finances are projected to go from deficit to surplus in 2015-16. All signs are that defence spending has been deferred in this budget to hasten a return to surplus. In the present economic and fiscal environment, this is neither unreasonable nor surprising (especially when you see how much money

Defence will get anyway). What is surprising is that the Defence budget papers assiduously fail to explain what's happened.

With only four years of funding visible, it is impossible to say anything about the 3% real growth commitment. But because the deferrals suppress funding growth over the next three years, the pace of growth in the years that follow will have to be rapid to deliver the promised average 3% out to 2017-18. The trouble is, that's exactly when the government will be trying to get back into surplus. If there was pressure on the defence budget this year, imagine what it will be like when the political Holy Grail of a surplus is within reach.

How much money will Defence get?

Despite the deferrals, defence funding will reach an historic high of \$26.8 billion next year, representing fully 2.3% of GDP. The year-on-year nominal increase is a stunning \$4.3 billion, amounting to a 16% real increase (relative to the 2.5% indexation). Several factors contribute to the jump. First, there's \$1.7 billion of extra operational supplementation (last year Defence absorbed \$1 billion of operational costs from within their base funding). Second, the depreciation of the Australian dollar has seen \$1.5 billion extra pumped into the budget to maintain the buying power of the Defence dollar. Third, the underlying 3% real growth from the 2000 White Paper is working its way through. Finally, there was close to a billion dollars of capital investment deferred out of last year's budget.

The high share of GDP accounted for by defence funding—a figure not seen since 1986—has been inflated by the recession and will fall back to 1.9% over the next four years as the economy recovers and defence spending moderates.

Indeed, after having enjoyed a large one-year boost, the defence budget will not change dramatically over the subsequent three years, with the overall trend being of modest decline in real terms.

Where will the money go?

As usual, supplementation has been provided for overseas deployments, including \$214 million for East Timor, \$60 million for Iraq and an impressive \$1.4 billion for Afghanistan. This brings the total cost of operations in Iraq and Afghanistan to \$2.4 billion and \$3.6 billion respectively.

There are also a series of initiatives announced for the years ahead that Defence will self-fund. Around \$405 million will be spent over the next four years, and \$1.5 billion over the decade, to boost Navy's numbers by 700 permanent personnel. Another \$71 million will be spent over the next four years to enhance the capability for land operations in complex environments, and \$45 million over the same period to extend the trial of providing health care to defence force families. These and other lesser initiatives announced in the budget will amount to \$585 million over the next four years and \$1.7 billion over the decade.

The real story in the budget is not the spending announced for the next few years, but the plans outlined for the next decade. Here, unfortunately, things are not so clear. As best we can tell, the situation is as follows.

Roughly speaking, there's around \$29 billion of new money available—\$10.8 from the new funding model (mainly from the new indexation regime as best we can tell), and \$18.2 billion in net savings from the \$20 billion savings program. And there's another \$15.9 billion that's outlined in the budget papers that appears to be mainly funding that Defence has been granted in the past but has either been lying unallocated to any initiatives or reallocated from within existing plans. Together with the savings and new funding, a \$45 billion war chest has been created for the next decade.

From the \$45 billion bounty, \$30 billion has been allocated to remediate the present and planned defence force, including \$6 billion for major capital equipment, \$10 billion for the net personnel and operating costs associated with new equipment, \$6 billion to fix the 'enterprise backbone' (estate, information technology, etc) and \$8 billion for other budget provisions related to 'remediation'. As for the remaining \$15 billion, we assume that it is spent on new White Paper initiatives.

Can it really be that Defence was underfunded to the tune of \$30 billion over the decade? No. Given that they have been able to find \$15.9 billion from within their own resources, the short fall was more like \$14.1 billion.

Ignoring the unallocated internal funds, the situation is remarkably simple: Defence will get an extra \$10.8 billion from the new funding regime for the next decade and save another \$18.2 billion through efficiencies. Around half of this money will be spent on fixing the holes left by poor planning (\$14.1 billion) and half will be spent on new initiatives from the White Paper (\$15 billion). Why the budget papers didn't just say this is a mystery.

The good news and the bad news

The good news is that military personnel numbers continue to grow. After several years when the defence force struggled to maintain its personnel numbers, all three services have posted encouraging results and are forecast to continue to do so. This is an encouraging turnaround in an area critical to the long-term development of the defence force.

The bad news is that, once again, investment in major capital equipment has been deferred. What's changed is that the budget papers fail to disclose the extent and timing of the delays. All we know for sure is that \$750 million has been deferred from 2009-10. Though there are signs that around \$3.5 billion may have deferred from the next four years. We have no idea what has been delayed from the rest of the decade, nor do we know when the deferred spending will now occur.

By our reckoning, a cumulative total of *at the very least* \$4.4 billion of spending has been deferred over the past eight years. We now face a situation where investment funding originally intended for the first decade of the century may have to await the third. The concern must be that the growing mountain of planned investment being pushed into the future will prove impossible to climb when the time comes.

The Strategic Reform Program

Central to the government's funding plans are the delivery of more than \$20 billion of gross savings over the next decade. Once out-turning is taken into account, this represents savings equivalent to around 6.9% of the present annual Defence budget. Not since the 1997 Defence Reform Program has such an ambitious savings target been set.

Unfortunately, very little detail is available on the program, aside from some aggregate figures. Efficiencies will be sought in payroll, finance and human resource management (\$1.4 billion), more savvy non-equipment purchasing (\$4.4 billion), consolidated and standardised information technology (\$1.9 billion), better inventory management (\$700 million), 'smart maintenance' of military equipment (\$4.4 billion) and workforce reform (\$1.9 billion). The remaining \$5.9 billion of savings remains unexplained except for a mention of savings from equipment procurement.

From what we know, it's surprising just how little of the savings depend on changes to the workforce. In fact, once initiatives in the White Paper are taken into account, military numbers will have grown by around 2,700 and civilian numbers by 1,200 by the end of the decade. Savings are planned to be achieved mainly by the more prudent purchase of goods and services provided by the private sector—this seems to be a very big ask.

But the Strategic Reform Program brings together work done within Defence over the past year and that from the independent budget audit undertaken by Mr George Pappas in 2008. And all signs are that the senior leadership of Defence—military and civilian—are signed up to deliver the savings. This is about as good as defence reform gets.

Yet we should not be complacent. Past reform programs in Defence have been worse than ineffective; they have damaged the organisation and undermined military capability while yielding less than expected savings. Far greater transparency is needed of what the reforms will entail and how the savings will be measured and verified.

Transparency and accountability

As the first budget after a new Defence White Paper, there is a glaring absence of substantive information on funding, investment and reform. The best that can be said is that the budget is consistent with a White Paper that's silent on when anything will occur or what things will cost. All we are offered is a vision of what the defence force will look like in 2030.

We don't know when new capability will arrive. We don't know when old capability will be fixed. We have minimal information on how \$20 billion of savings will be accomplished, and not much more on how the money will be spent. We don't know how much capital investment has been delayed, or when it has been delayed to. And from a funding model extending twenty-one years into the future, we are only given a glimpse of the next four years.

But relax; we are going to have twelve submarines sometime after 2030.

SECTION 1 – BACKGROUND

1.1 Strategic Context for the Budget – the 2009 Defence White Paper

After sixteen months of preparation (and a five month delay), the new Defence White Paper was released a mere ten days prior to this year's budget on 2 May 2009. With the somewhat foreboding title *Defending Australia in the Asia Pacific Century: Force 2030*, the document weighs in at 140 pages. (For ease of reference, we shall henceforth refer to it as *Defence 2009*.)

Defence White Papers are rare creatures. Since the end of the Vietnam conflict, only five have seen the light of day; the first in 1976 and later ones in 1987, 1994, 2000 and now 2009. The scope and level of detail varies from document to document. One thing that sets *Defence 2009* apart from its predecessors is the addition of a short chapter on defence management and reform. In other ways the document is very traditional.

Anyone expecting a new concept of how Australia will use armed force in the twenty-first century will be disappointed. While scholars of Australian strategic policy will be able to discern differences, the strategic framework used in *Defence 2009* is essentially the concentric circles approach used in the 2000 White Paper. Highest priority is given to the defence of Australia, followed in descending priority by the security of the immediate region, the stability of the Asia Pacific, and, finally, the maintenance of a rules-based global order. And, as with the 2000 White Paper, only the two highest priorities determine the basic shape of the defence force.

What has changed is the assessment of Australia's future strategic environment. Specifically, there is a much greater emphasis placed on the rise of China and the shifting power balance in the Asia Pacific than before. And while the narrative is careful to put at least one degree of separation between China's rise and Australia's defence, there is no escaping the fact that the rise of China is front and centre in the strategic vista depicted by *Defence 2009*.

The reader can explore for themselves how *Defence 2009* brings together an old strategic framework and a new strategic outlook to come up with an expanded maritime force including *at least* 12 submarines and land-attack cruise missiles. If you have trouble, don't worry, past experience shows that the strategic narratives contained in Defence White Papers are at best loosely—and often only selectively—related to decisions about developing Australia's defence force¹.

The problem is hard to correct; there is no rigorous deductive process that can translate strategic prognostications into concrete investment decisions. The logical air-gap is invariably bridged by judgement. It doesn't really matter who makes the

¹ For further development of this argument see: Mark Thomson, 'The challenge of coherence: strategic guidance, capability, and budgets' in *History as Policy: Framing the debate on the future of Australia's defence policy*, edited by Ron Huisken and Meredith Thatcher; ANU Press, Canberra, 2007.

judgements—civilian bureaucrats or military professionals—almost as soon as a White Paper comes out, arguments erupt. So it has been this time.

And there is plenty to argue about. In terms of equipping and modernising the defence force, *Defence 2009* is at least as detailed as any of its predecessors in spelling out the sorts of capabilities the government wants. To start with, the plans set in train by the previous government to expand and increase the combat weight and deployability of the Army have been retained, as have the additional new capabilities granted to the Air Force. Similarly, most of the prospective projects planned by the previous government appear to have been retained. Where changes have occurred, they tend to reflect practicalities—like the need to make up for the cancellation of the *Super Seasprite* acquisition—rather than any substantive new vision for what the defence force will look like.

To its credit, *Defence 2009* also outlines the remediation of many of the shortfalls in the current and planned force—the sorts of things that prevent some of our multi-billion dollar assets from being used in anger. What's more, it promises that underfunding of the current and projected force has been fixed, and that remediation of Defence's corporate and support infrastructure has been funded.

But *Defence 2009* is not just about Kevin Rudd picking up the tab for the defence force planned by John Howard. In the near-term there are some new initiatives, including establishing a cyber-security operations centre and equipping the now under-construction Air Warfare Destroyers with land-attack missiles. And because the time horizon for *Defence 2009* extends more than a decade beyond existing plans, there are a number of new acquisitions driven by the approaching obsolescence of existing platforms. As is always the case, the opportunity is being taken to update and improve capabilities as this occurs. Larger multi-role vessels will replace the existing minehunters, hydrographic and patrol boats when they reach the end of their life. The Anzac frigates will be replaced by a larger vessel with an anti-submarine bias, and the replacement submarine program promises to deliver not only more capable boats but will at least double the size of the fleet from six to twelve.

While the raft of new maritime capabilities made a big splash when the White Paper was announced, a reality check is called for. There will be at least one White Paper and three elections before anyone really decides how many submarines we will buy or what the new frigates will look like. That's not to suggest that work does not need to begin now on refining the requirements and selecting a design, but that's a far cry from putting in an order for the steel to fabricate hulls.

In one sense it is reassuring to see Defence and government take such a long-term view of defence planning. It is only by doing so that issues of budget sustainability and asset obsolescence can be understood and managed. However, we risk adopting a defence posture that is more talk than action. Having made the case, albeit elliptically, that we need to hedge against the rise of the Middle Kingdom, *Defence 2009* presents a response that will take decades to take form. There is no reason why we could not have kept our rhetorical powder dry and our options open much longer.

More importantly, the focus on the far-term comes at the expense of almost any information about what Defence will deliver in the meantime. Lots of things are going

to happen but we are not told when. Apart, that is, from the year 2030. An entire chapter in *Defence 2009* is devoted to describing the shape of things to come in that year. One might have thought that the intervening 21 years would rate a mention.

The only dates we are given are for mature projects with previously disclosed schedules. Nowhere has Defence been made responsible for delivering something new prior to 2030. Even when it comes to remediating the many deficiencies in the defence force, the document is silent about when problems will be fixed.

The absence of dates and figures cannot be an accident. A document that is claimed to be ‘the most comprehensive White Paper of the modern era’ is surely backed up by detailed schedules and cost estimates. Yet, the document is so deliberately vague that public and parliamentary scrutiny of the government’s plans will be tightly curtailed, as will be Defence’s accountability to the taxpayer for delivering on the plans. This is in stark contrast to the transparency of the 2000 White Paper.

The document is only a little more forthcoming about money. In terms of funding, nothing much changes over the next decade; essentially the present pattern of 3% per annum real growth was confirmed and a revised indexation scheme was adopted. Although the new indexation scheme is (for the moment) more generous, its full adoption was delayed six years in this budget. To fund the promised remediation and new capabilities, Defence has to find \$20 billion in efficiency savings. Even after this budget, we are yet to see a plan for how this money will be found.

For the decade that follows, defence spending growth has been pared back to 2.2% real per annum. On past trends, this will be insufficient to even maintain the force in a steady state (the average trend has been 2.7% annual real growth since WWII). No explanation is given for the reduction in growth. For a plan that claims to defend Australia out to 2030 in an increasingly uncertain strategic environment, it is curious that 2020 marks the point where funding drops below that needed to sustain the force.

Thus, while we know what sort of defence force the government aspires to in 2030, we do not know what sort of defence force we will have in the meantime, nor, even after this budget, do we know much about how it’s going to be paid for. Perhaps we will learn more when the Defence Capability Plan is released later in the year.

In the meantime, we are left to speculate on why such secrecy surrounds schedules and funding. To the extent that Defence has shaped the government’s actions the explanation is easy; Defence doesn’t want to be held to account for the rigour of its planning or the delivery of results. Why would they? Their experience with public accountability in trying to meet the many specific targets set by the 2000 White Paper could not have been fun.

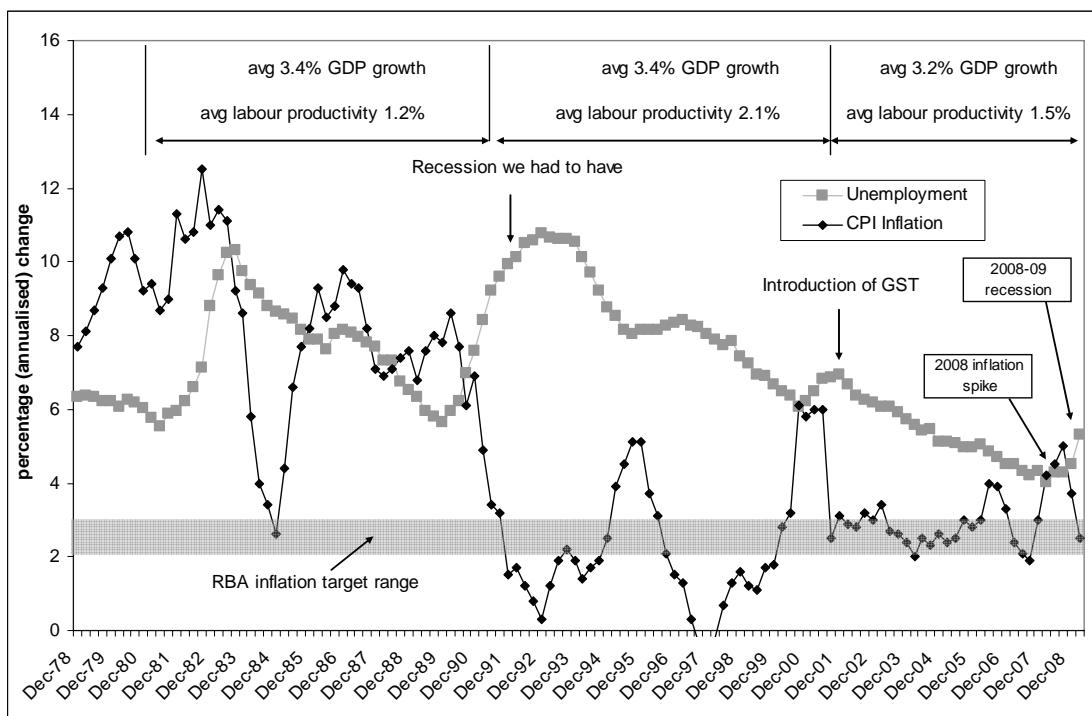
As for the government, perhaps they have been spooked by the Global Financial Crisis and are afraid that circumstances will force them to further curtail defence spending and plans in the years ahead. If so, surely this is something that should be said plainly and openly. If there is a financial risk to developing the defence force the government has decided Australia needs, let’s hear about it.

1.2 Economic Context for the Budget

From the early 1990s until last year, Australia enjoyed relatively favourable economic conditions, see Figure 1.2.1. Three things stood out:

- Economic growth was healthy, averaging 3.4% during the 1990s and 3.2% from 2000 to 2007, despite a fall in labour productivity growth.
- Unemployment fell from a peak of 10.8% in late 1992 to a thirty-four year low of 4% in early 2008 (at the same time as workforce participation edged up from 62.7% to 65.2%).
- Following the ‘recession we had to have’ in 1991-92, the long-term rate of inflation fell to effectively half what it was in the 1970s and 1980s, notwithstanding a short-lived spike in 2008.

Figure 1.2.1: Australian economic performance 1978 to 2008



Source: Reserve Bank of Australia, Australian Bureau of Statistics and Treasury statistics

The strong economic growth of recent years allowed the previous government to simultaneously increase spending and cut taxes. Despite the fact that the GST ensured that total tax revenues continued to rise as a share of GDP, it was a happy time all around. Few areas were happier than Defence, which saw its funding grow more or less in tandem with GDP from 1999 onwards.

But nothing lasts forever. From around 2003, when unemployment fell below 5%, capacity constraints started to be felt in the economy and in 2008 inflation began to rise quickly—this was the central problem faced at the time of last year’s budget. But things changed quickly. In late 2008, the long-simmering US sub-prime crisis spilled over into a global financial crisis that spread quickly to the real economy (see Section

7 of this brief for a more detailed examination of the Global Financial Crisis and its impact). The timing of the recent events is reflected in the changes to the Reserve Bank of Australia (RBA) target cash rate set out in Table 1.2.1. Note how the rise in rates to combat inflation was closely followed by a fall to counter the recession.

Table 1.2.1: RBA target cash rate 2000 to 2008

Date	Dec 2003	Mar 2005	May 2006	Nov 2006	Aug 2007	Nov 2007	Feb 2008	Mar 2008	Sep 2008	Oct 2008	Nov 2008	Dec 2008	Feb 2009	Apr 2009
%	5.25	5.50	5.75	6.00	6.50	6.75	7.00	7.25	7.00	6.00	5.25	4.25	3.25	3.00

Source: RBA.

Thus, in a matter of twelve months, the focus turned through 180 degrees—from trying to stop the economy from overheating, to fanning its embers in a severe recession.

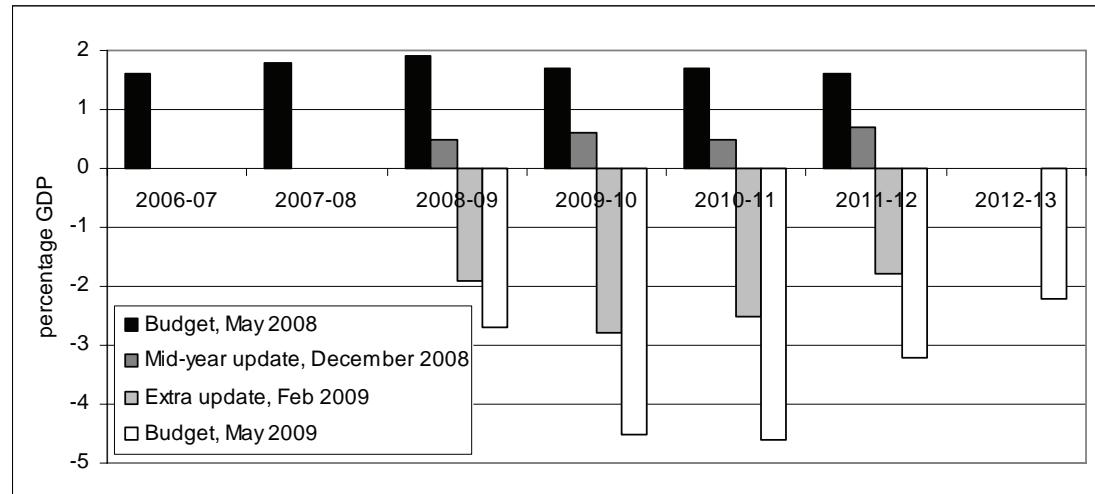
Inevitably, the downturn has been accompanied by a deterioration of the government's fiscal situation. Table 1.2.2 compares the outlook in May 2008 with that of today. Figure 1.2.2 graphs the dramatic reversal of the fiscal outlook in successive official estimates over the same period.

Table 1.2.2: Budget aggregates 2008-09 and 2009-10 Budgets (nominal dollars)

		06-07	07-08	08-09	09-10	10-11	11-12	12-13
Budget 2008-09	Underlying cash balance (\$b)	17.2	16.8	21.7	19.7	19.0	18.9	
	Per cent of GDP	1.6	1.5	1.8	1.5	1.4	1.3	
	Fiscal balance (\$b)	17.2	20.4	23.1	22.4	23.3	22.6	
	Per cent of GDP	1.6	1.8	1.9	1.7	1.7	1.6	
Budget 2009-10	Underlying cash balance (\$b)	17.2	19.7	-32.1	-57.6	-57.1	-44.5	-28.2
	Per cent of GDP	1.6	1.7	-2.7	-4.9	-4.7	-3.4	-2.0
	Fiscal balance (\$b)	17.2	21.0	-32.9	-53.1	-56.0	-41.8	-30.3
	Per cent of GDP	1.6	1.9	-2.7	-4.5	-4.6	-3.2	-2.2

Source: Budget Papers No. 1, 2008–09 and 2009–10

Figure 1.2.2: The deteriorating outlook—fiscal balance per cent GDP

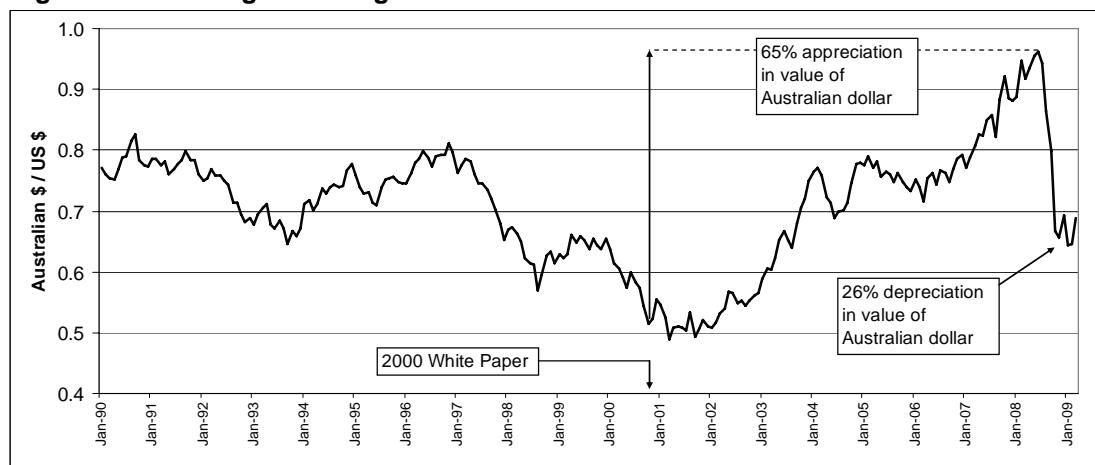


Source: Budget papers, MYEFO, and 2009 Economic Update

According to the budget papers, the Australian economy should bounce back in 2011-12 and 2012-13 with above trend GDP growth of 4.5%. Provided that spending can be contained, this should allow the government to return the budget to surplus by 2015-16. The impact of the government's fiscal situation on Defence funding is explored in Section 7 of this brief.

Defence spends something like \$5 billion a year offshore (no official figure is available) mostly in contracts written in US dollars. And while Defence is insulated from fluctuations on a no-win, no-loss basis with the Department of Finance and Deregulation, the government, and ultimately the taxpayer, feels the pain or gain. Unfortunately, after peaking in early 2008, the value of the Australian dollar depreciated by 26% in the space of a few months, thereby adding around \$13.8 billion to the cost of Defence over eleven years.

Figure 1.2.3: Foreign exchange



Source: RBA

The final economic factor that's important to Defence is the awkwardly named *Implicit Non-Farm GDP Deflator* (NFGDPD) to which Defence funding has, until this budget, been indexed in an attempt to maintain its buying power. This is separate from and in addition to the adjustments made for foreign exchange. Table 1.2.3 details actual and projected changes to the NFGDPD and CPI.

Table 1.2.3: Changes to the Implicit Non-Farm GDP Deflator and CPI

	actual							budget and estimated		
	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11
NFGDPD	2.1	2.6	4.0	3.9	4.8	4.8	4.3	5.75	-1.0	1.5
CPI	2.9	3.1	2.4	2.4	3.2	2.9	4.5	1.75	1.75	1.5

Source: APH Library, RBA, ABS and Budget Papers

Fluctuations in the NFGDPD saw Defence lose \$4.3 billion in planned funding for the decade prior to the budget, and gain \$1.9 billion over the forthcoming decade in a final adjustment made in the budget. Over the next four years, funding has been decreased by \$2 billion as a result of these two adjustments. New indexation arrangements for Defence were announced in the 2009 Defence White Paper; these are explored in Section 3 of this brief.

1.3 Defence Organisation and Management

The Outcomes and Program Framework

As from 2009-10, the Defence budget will be set out according to a framework of ‘outcomes’ and ‘programs’. This replaces the ‘outcomes’ and ‘outputs’ framework that had been in place since 1999.

- **Outcomes** are the results or benefits that the Commonwealth aims to deliver to the community through the work of its agencies. They are specified for each agency, and are meant to express the purpose or goal of each agency’s activities.
- **Programs** are activities that agencies undertake in pursuit of the outcomes they are expected to deliver.

Under the framework, the performance of agencies is measured. This is done through specific targets (like flying hours for Air Force) and, ultimately, the extent to which their programs actually deliver the outcomes intended. So the aim is to show not only how much an agency is *doing*, but how much it is actually *achieving*.

The Defence Outcomes

As of this budget, Defence’s Outcomes are:

Outcome 1: The protection and advancement of Australia’s national interests through the provision of military capabilities and the promotion of security and stability.

Outcome 2: The advancement of Australia’s strategic interests through the conduct of military operations and other tasks as directed by Government.

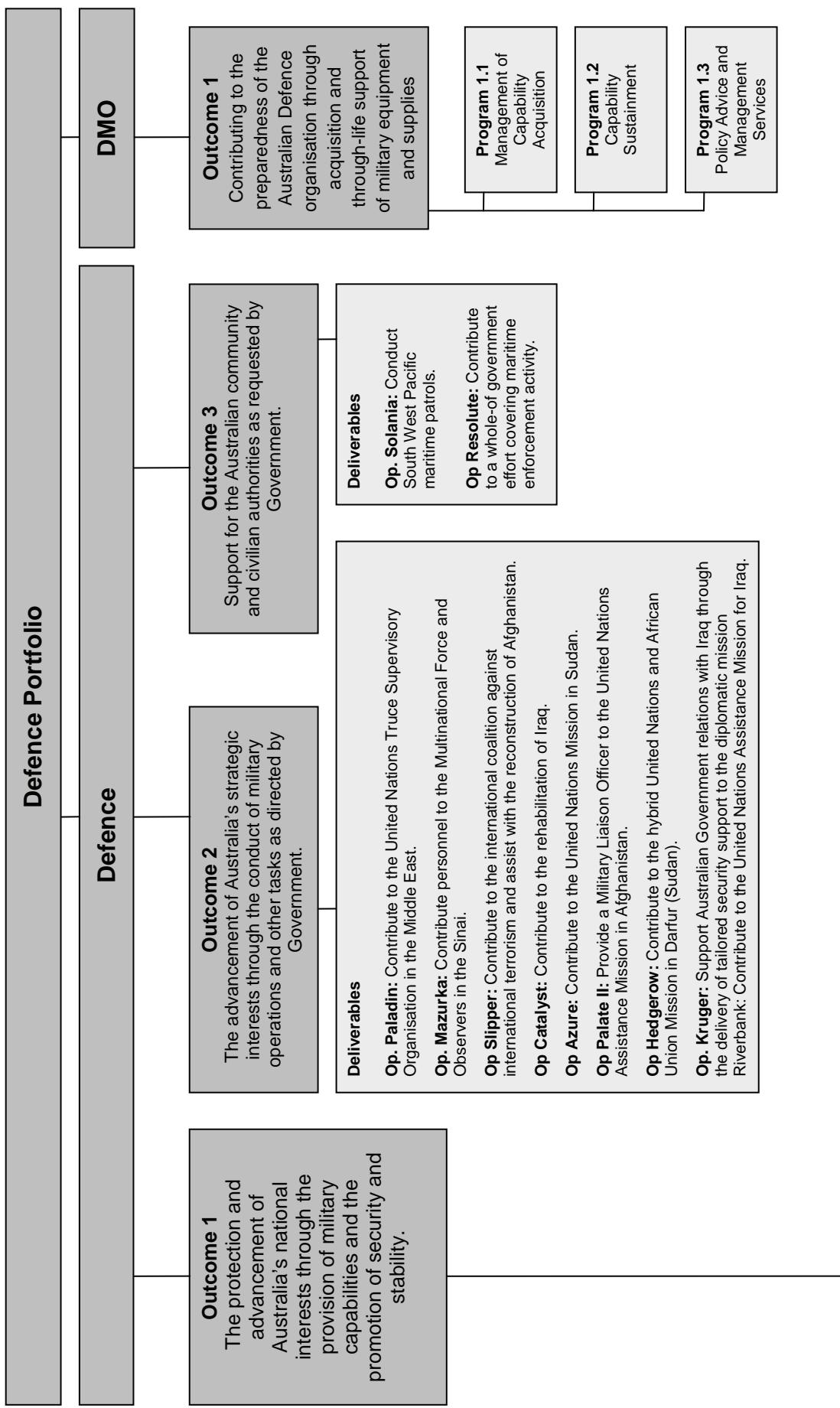
Outcome 3: Support for the Australian community and civilian authorities as requested by Government.

The programs that contribute to these three outcomes are set out in Figure 1.3.1. Note that the programs are closely aligned with the actual organisational structure of Defence, as can be seen by comparison with the Defence ‘wiring diagram’ in Figure 1.3.2. In Figure 1.3.1 we have included a break-down of the sub-components of the programs in terms of their principal organisational parts.

This framework provides greater visibility of resources consumption within the organisation than the output-based approach that was in place up to 2007-08. But this comes at the loss of knowing what it costs to deliver military capability, which is what the old framework attempted to do. Ultimately, what really matters is how much it costs to deliver ships, planes and battalions ready for deployment, not how much money is spent on health services, legal advice or personnel management. Of course, in a perfect world we would be told both.

Curiously, at the same time as Defence’s formal budget framework has abandoned the concept of outputs and adopted an organisation-based program approach, the 2009 White Paper says that Defence will move to an output-driven internal budgeting process. It is too early to know what this will entail or the extent—if any—to which it will be visible to the public.

Figure 1.3.1: The new Defence Outcome-Output framework



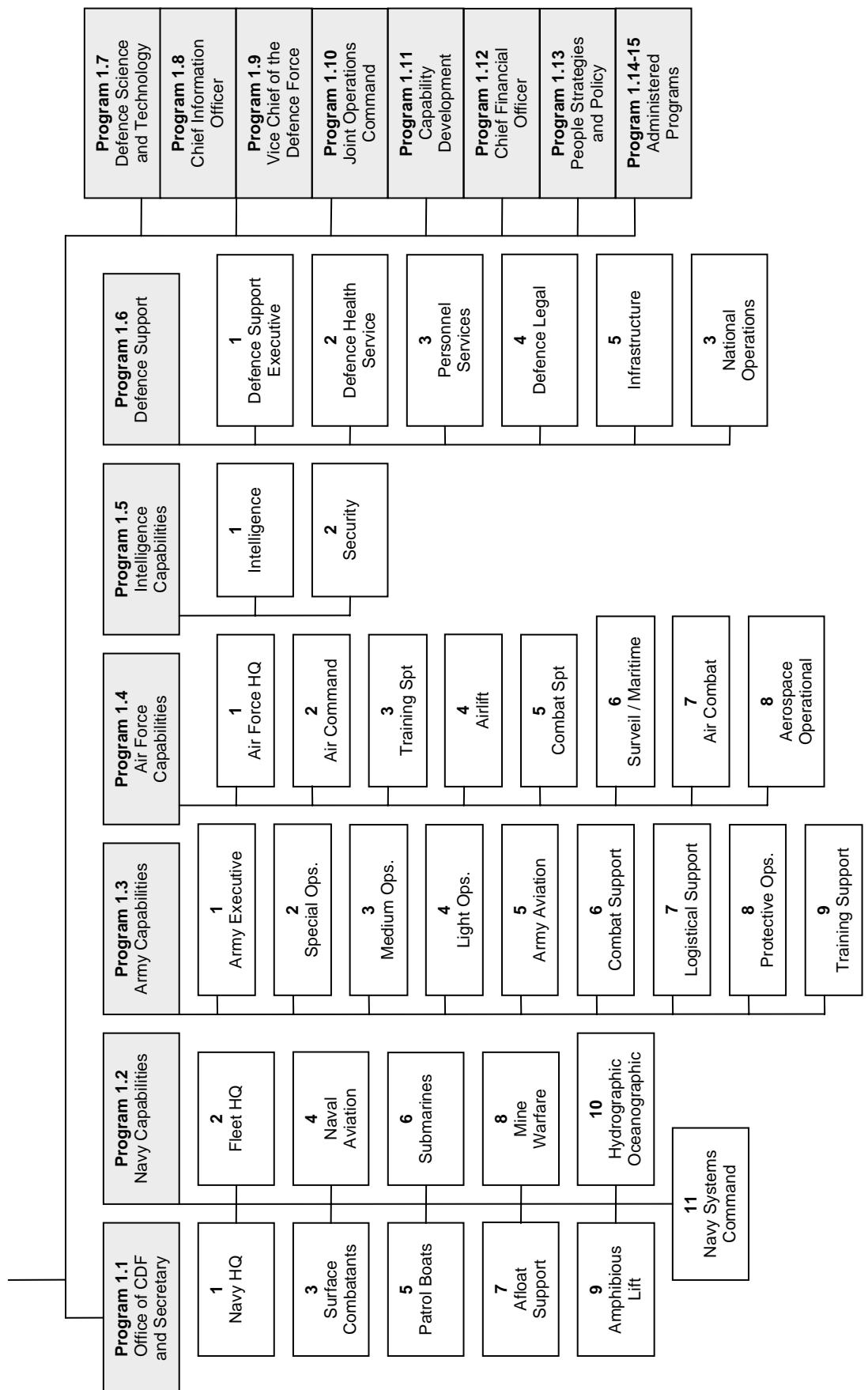
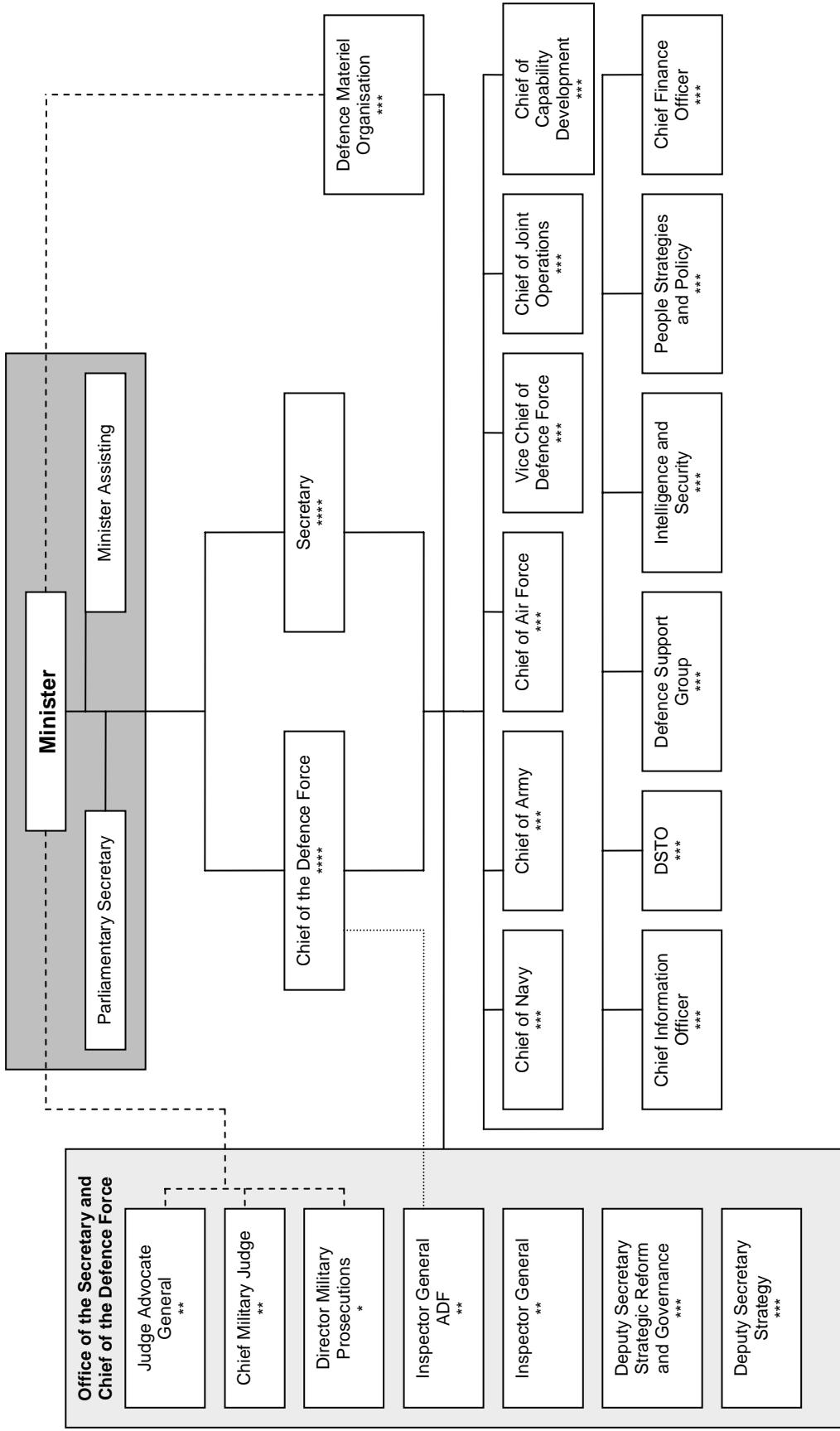


Figure 1.3.2: Defence organisational structure (as at May 2008)



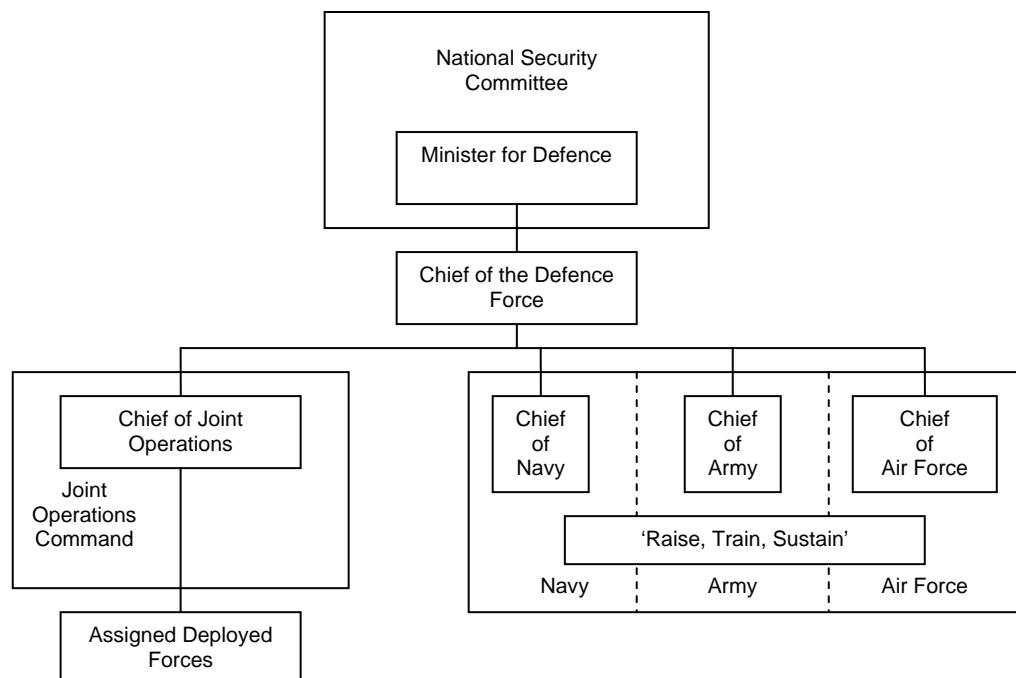
ADF command structure

It is important not to confuse the day-to-day management of the Department of Defence with the command of military operations. The former occurs through the diarchy and group/output arrangements discussed earlier. The latter is exercised through a formal command chain and dedicated headquarters structure. In this parallel arrangement, units are temporarily re-assigned from the Services to be commanded on operations and exercises as required.

The ADF is currently undergoing a phased transition to an integrated model of command and control. This new structure separates the command of operations from the Raise/Train/Sustain functions of the single Services (Figure 1.3.3). Since January 2007, ADF operations have been controlled through a single joint headquarters, designated the Headquarters Joint Operations Command (HQJOC).

A co-located HQJOC facility is now in operation near Bungendore, NSW. It is staffed by around 750 personnel and has been operational since late 2008.

Figure 1.3.3: ADF command structure



1.4 National Security Spending

The events of 9/11 prompted the recognition that no single agency has the capacity, or range of capabilities, necessary to ensure our security. The threat of terrorism within Australia, and to Australians abroad, has forced a whole-of-government approach to national security at the federal level. Even beyond the threat of terrorism, it is increasingly recognised that our national security interests are best served by a coordinated approach that uses all the levers available to government.

It's beyond the scope of this Defence budget brief to analyse and explain the budgets of all the agencies that contribute to national security. Instead, we'll content ourselves with a broad-brush description of how much is spent in key agencies. If nothing else, it provides a useful yardstick against which we can measure what's spent on defence. Unfortunately, because of the difficulty in finding data, our discussion excludes spending at the state and local levels.

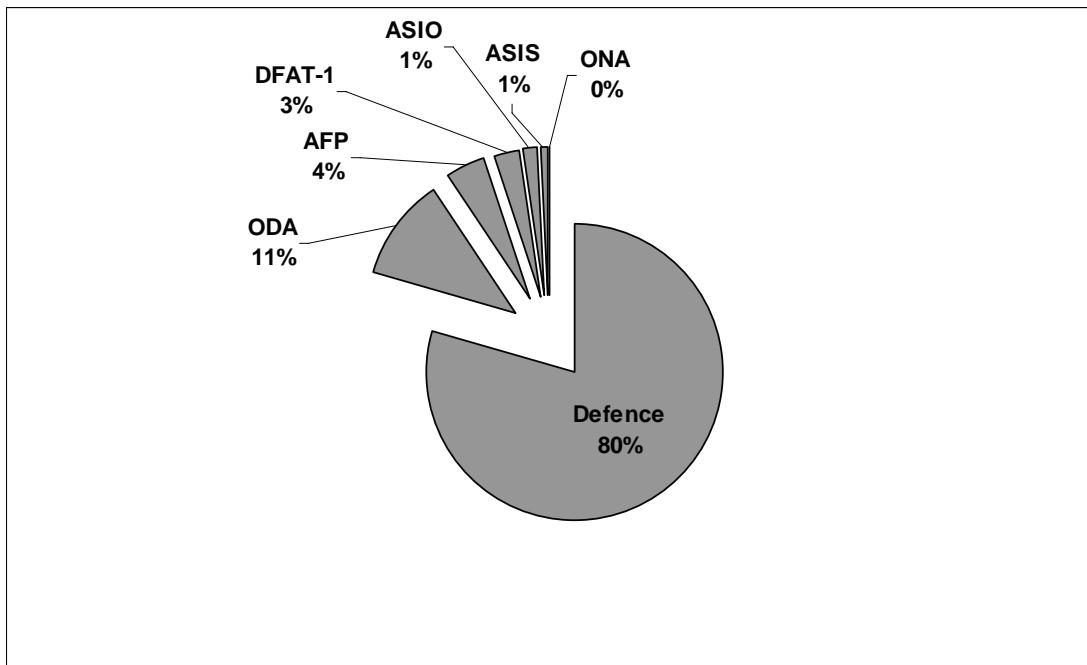
A number of federal agencies can make a credible claim to delivering some part of our national security. In selecting agencies, we have taken a liberal view of what constitutes national security, although we have excluded funding for Outcomes within agencies that are clearly unrelated. Here's our list in alphabetical order, which cannot be claimed as exhaustive:

- Australian Agency for International Development (AusAID)
- Australian Federal Police (AFP)
- Australian Security Intelligence Organisation (ASIO)
- Australian Secret Intelligence Service (ASIS)
- Department of Defence (DOD)
- Department of Foreign Affairs and Trade (*Outcome 1: Australia's national interests protected and advanced through contributions to international security, national economic and trade performance and global co-operation.*) (DFAT-1)
- Office of National Assessments (ONA)

Clearly, some of the activities of the listed agencies (even with the restriction to specific Outcomes) go beyond national security. Conversely, other agencies that have been left out, like the Australian Customs Service, make a significant contribution to national security within their broader range of responsibilities. Such is the challenge of dealing with the aggregated data available in the budget papers. We have removed the Department of Immigration and Citizenship from this year's reckoning because we have been unable to clearly track the transfer of funds to other agencies.

Figure 1.4.1 compares the appropriations allocated to each of the aforementioned agencies in 2009-10. For AusAID, rather than use the appropriation, we have listed Australia's total Overseas Development Aid for the year.

Figure 1.4.1: Federal National Security Spending



Source: 2009-10 Budget Paper No. 4

At the risk of stating the obvious, Defence dwarfs all other federal areas of spending that contribute in some way to national security. This is despite the fact that many agencies (in particular, ASIS, ASIO and ONA) have received large boosts to their funding post 9/11, as Table 1.4.1 below shows. Because changes in outputs and the presentation of budget figures make it difficult to extract precisely comparable figures from year to year, the numbers should be used with caution—though the broad trends are clear. Note also that the calculated growth is nominal rather than real.

Table 1.4.1: Federal National Security Appropriations 2001-02 to 2009-10

	2001-02 \$ m	2002-03 \$ m	2003-04 \$ m	2004-05 \$ m	2005-06 \$ m	2006-07 \$ m	2007-08 \$ m	2008-09 \$ m	2009-10 \$ m	Nominal 8-year increase
Defence	13,191	14,216	15,439	16,224	17,523	19,142	19,846	22,514	26,793	103%
ODA	1,755	1,831	1,973	2,198	2,698	3,018	3,174	3,790	3818.8	118%
AFP	523	391	609	777	968	885	1,310	1,385	1475	182%
DFAT-1	660	701	709	774	717	740	822	843.4	956.6	45%
ASIO	69	90	98	161	187	341	450	429	428.5	521%
ASIS	54	59	80	89	100	131	162	217	247	357%
ONA	7	8	11	18	28	28	35	38	33.9	384%

Source: 2001-02 to 2009-10 Budget Paper No. 4

1.5 Measuring Defence Spending

The amount a country spends on defence is a direct measure of its commitment to protect itself. Accordingly, a lot of attention is placed on comparing levels of defence spending between countries and on tracking the rates at which those levels are increasing or decreasing. For example, here in Australia a lot of attention has been placed on the promised 3% real growth in the Defence budget in recent years. It is important, therefore, that reporting of defence spending captures what's actually going on.

Table 1.5.1 sets out the presentation in the 2009-10 PBS [Table 5, p.19] excluding the administered appropriations. (We ignore the administered appropriations for superannuation and housing because they are not controlled by Defence and are appropriated through the organisation for convenience.) The bottom line is *Total Defence Funding* which, in the past, has been presented in the PBS as 'the most common way of presenting the Defence budget' [2008-09 PBS, p.119].

Table 1.5.1 Total Defence funding FY 2009-10

	2009-10 \$'000
Departmental	
1. Output Appropriation	21,692,203
2. Equity Injection	4,011,496
3. Specific purpose payments	-
4. Current year's appropriation (1+2+3)	25,703,699
5. Drawdown of appropriations carried forward	60,000
6. Return to Official Public Account (OPA)	-222,972
7. Funding from/to OPA (5+6)	-162,972
8. Funding from Government (4+7)	25,540,727
9. Capital Receipts	286,314
10. Own-source Revenue	814,446
11. Funding from other sources (9+10)	1,100,760
12. Total Defence Funding (8+11)	26,641,487

Source: 2009-10 PBS

The easiest way to explore what a better approach might be is to examine each of the elements appearing in Table 1.5.1.

Current year's appropriations: This is the least ambiguous part of the problem. Each year the government formally appropriates money to Defence. The breakdown of the appropriation in terms of outputs and equity is an artefact of accrual accounting that need not concern us. What matters is that this is the quantum of cold hard cash that the government plans to make available to Defence for the financial year. As such, any credible measure of Defence funding must include this money.

Drawdown of appropriation carried forward: Following several years where Defence substantially underspent its budget, an *Appropriation Receivable* account was established to keep track of funds returned to government so that they might be drawn on in future years. Shifts to this account represent either the expenditure of additional public funds by Defence or the return of unspent funds. To properly track the funding employed by Defence, it makes good sense to take account of increases and decreases to the Appropriation Receivable account. However, if this is accepted, it follows that changes to Defence's cash holding must also be accounted for (since that's where the money in the appropriation receivable came from originally).

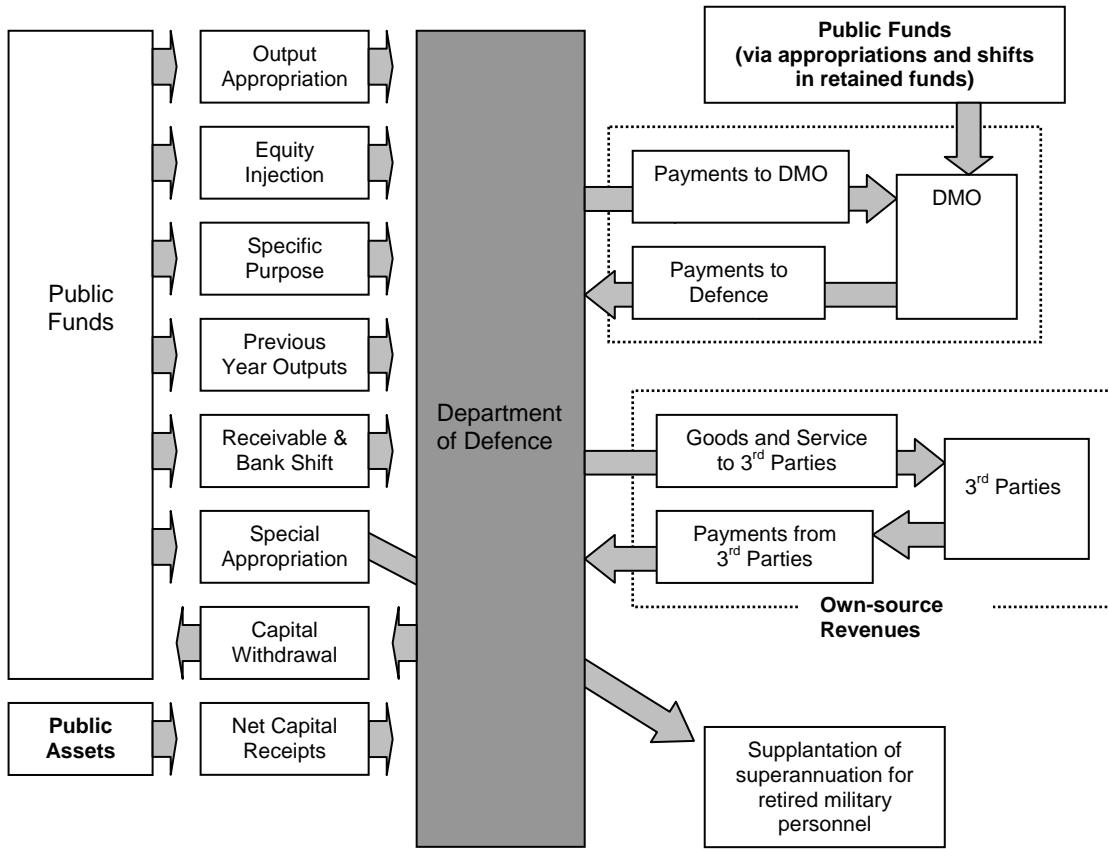
Capital Receipts: As custodian of more than \$50 billion of public assets including land, buildings and military equipment, Defence inevitably receives cash from the disposal of items that are no longer needed. Some of this money is returned to government via a **Return to the OPA**. The remainder is retained by Defence and is called **Net Capital Receipts**. Given that Net Capital Receipts are generated from the sales of public assets, it is correct to count this income as part of Defence funding.

Own-source Revenues: Defence receives revenue from a number of sources. These include the supply of goods and services to third parties such as Defence personnel, who pay a share of the cost of their food and lodging provided by Defence, and foreign governments that purchase items like fuel. It makes little sense to include this as part of Defence funding. While it is perhaps reasonable to include revenue raised by using public assets (like Defence accommodation), the vast bulk of Own-source Revenue reflects Defence acting as an intermediary that transfers goods between 3rd party providers and 3rd party customers. For example, the sale of fuel to a foreign government or rations to personnel delivers no revenue to Defence that is not at least equal to the cost of doing so. Or to put it another way, no one could seriously contend that Defence funding has risen by \$50 million simply because, for example, an extra \$50 million of fuel was purchased and sold on to the United States.

Own-source Revenues also includes transfers from DMO to Defence that cancel payments from Defence to DMO. The worst part is that these funds then get counted *twice* in the calculation of Total Defence Funding. It's hard to put an exact figure on it, but Defence's Own Source Revenues jumped by about \$200 million the year that DMO became a prescribed agency, and DMO will pay Defence \$246 million in 2009-10 (PBS page 130). If there was ever any doubt that Own Source Revenues should be excluded from what's counted as Defence spending, this should settle the matter. Figure 1.5.1 is our best attempt to depict the situation graphically, though some simplification has been necessary.

Even if the double-shuffle payments to DMO was the only complication, that would be enough to reject *Total Defence Funding* as a credible measure of the Defence budget. But there is more. *Total Defence Funding* also includes payments to DMO that have in the past remained unspent. Over the past four years more than \$927 million has accumulated in the DMO Special Account, including \$414 million from 2007-08. (To make matters worse, at least \$440 million in the DMO Special Account represents delayed major capital equipment purchases that were not disclosed in Defence's reckoning of capital investment.)

Figure 1.5.1: Defence Cash and Resource Flows



From a strict accounting perspective, no rules have been broken. Defence reports its funding accurately, and DMO reports its cash flow properly. Yet there is something surreal about failing to reconcile the net impact of the two things to show what's actually going on, especially given the high prominence of defence funding in recent years.

So what is the 'Defence budget'?

While there is an accounting distinction between Defence and DMO, any sensible calculation of the 'Defence budget' must reflect the total impost on the taxpayer in delivering defence capability. This is easily achieved by adding DMO funding to the calculation and ignoring the churn of money in between. This year's PBS attempts a consolidation of the Defence and DMO budgets [PBS, Table 2] but it is not especially illuminating.

In light of the foregoing discussion, it seems sensible to include Funding from Government, Net Capital Receipts (= Capital Receipts – Return to OPA), Net Bank Balance Shifts, Appropriation Receivable and Special Account Shifts, but to exclude Own-source Revenue. And then to do the same for DMO and then add the results together, safe in the knowledge that the accounting transfers between the two entities have been excluded, see Table 1.5.2. The addition of DMO appropriations is especially important because under new arrangements, DMO directly receives around \$700 million that used to be funded through Defence.

Table 1.5.2: Total Defence resourcing FY 2008-09

	Total Defence Funding	ASPI Net Defence Spending
Departmental		
1. Output Appropriation	21,692,203	21,692,203
2. Equity Injection	4,011,496	4,011,496
3. Output for Previous Year	-	-
4. Current year's appropriation	25,703,699	25,703,699
5. Drawdown of appropriations receivable	60,000	60,000
6. Return to OPA	-222,972	-222,972
6. Funding from Government	25,540,727	25,540,727
7. Capital Receipts	286,314	286,314
8. Own-source Revenue	811,892	
9. Funding from other sources	1,100,760	286,314
10. DMO Appropriation		851,082
11. DMO drawdown of Special Account		115,293
12. Total Defence Funding	26,641,487	
13. ASPI Net Defence Funding		26,793,416

The difference is not large. Our calculation of Net Defence Funding yields a figure only 0.6% above that of Total Defence Funding. The difference would be larger if not for the cancellation between the \$812 million of own-source revenues and \$851 million of DMO funding. We believe that *ASPI Net Defence Funding* is a better measure of the 'Defence budget' than *Total Defence Funding*. It's what is spent *on defence*, rather than what's spent *by Defence* that matters.

SECTION 2 – DEFENCE BUDGET 2009-10 PBS EXPLAINED

The 201 pages of the 2009–10 Defence Portfolio Budget Statements (PBS) set out the government’s plan for the expenditure of more than \$26 billion by Defence in the coming financial year.

This guide explains and where possible analyses the information in the PBS. In doing so, we skim over those parts of the PBS that are relatively clear, and focus on those areas where explanation might be useful. Unfortunately this task has been made more difficult by this year’s omission of some key information that was previously available. It is worth noting that the document is 24 pages shorter than last year and 152 pages less than two years ago. We appear to be on a downward spiral of disclosure.

Some of the material that follows is unavoidably technical due to the disciplines and complexities of accounting. However, it is not necessary to read this section as a whole, or in sequence, to gain insight. Every attempt has been made to enable the reader to jump in and look at those items of most interest.

This brief does not cover in any detail the funds administered by Defence on behalf of the government for superannuation and housing support services for current and retired Defence personnel.

Most parts of the guide are best read with the PBS at hand. Copies can be downloaded from the web at <<http://www.defence.gov.au/budget/>>.

Section 2.1: Strategic direction [PBS Section 1.1]

The overview chapter of the PBS begins with a brief discussion of the strategic context. Not surprisingly, the focus this year is on the outcome of the 2009 Defence White Paper. Changes to the organisational structure of Defence are then surveyed (see Section 1 of this brief for an explanation).

Section 2.2: Resourcing [PBS Section 1.2]

The ‘rubber hits the road’ in Chapter 2 of the PBS, in terms of allocating money to get things done. It contains the financial statements, new budget measures and the funding bottom line.

How much money will Defence get?

On page 19 of the PBS, we get to the heart of the issue. Table 5 gives three key figures for the Defence budget:

- **Total Revenue from Government**, being those funds formally *appropriated* to Defence by the government for departmental purposes along with shifts in appropriation receivable (unspent money from previous years). In 2009-10 this amounts to \$25,540,727,000.
- **Total Defence Funding**, being those funds actually *available* to Defence including appropriations and revenue from other sources. In 2009-10 this amounts to \$26,641,487,000.
- **Total Defence Resourcing**, being Total Defence Funding plus those funds appropriated administratively through Defence for superannuation and defence housing subsidies. In 2009-010 this amounts to \$30,074,321,000.

Of these three figures, *Total Defence Funding* is the one most usually quoted as the defence budget. It represents the funds expended by Defence to deliver the departmental outcomes and maintain the ongoing program of investment in new equipment and facilities. Note, *Total Defence Funding* does not include administered funds for superannuation and defence housing subsidies.

However, as explained in the last section, *Total Defence Funding* is inflated by churning of money (including in past years between DMO and Defence) that delivers no military capability or outcome. What’s more, Total Departmental Funding ignores the money appropriated directly to the DMO and the money that in recent years has been accumulating unspent in the DMO Special Account. We believe that the *ASPI Net Defence Spending* figure accounts for these issues properly and therefore gives a more accurate picture of how much is being spent on delivering defence capability and outcomes. Henceforth, we will only present the *ASPI Net Defence Funding* figure.

Several other measures of the Defence budget arise within the complexities of the Commonwealth finance framework. In past years, these have been presented and explained in the PBS. No such information has been included in the 2009-10 PBS.

How much money will Defence receive?

Table 2.2.1 displays Defence funding for the past nine, and next four, financial years. Also shown are both the nominal and real year-to-year percentage growth rates.

Table 2.2.1: ASPI Net Defence Funding – real (2009-10\$) and nominal growth

	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13
Funds (nominal)	12,319	13,191	14,216	15,439	16,224	17,523	19,142	19,846	22,514	26,793	27,079	27,044	26,427
Growth (nominal)		7.08%	7.78%	8.60%	5.09%	8.01%	9.24%	3.68%	13.44%	19.01%	1.06%	-0.13%	-2.28%
Funds (real)	16,780	17,567	18,406	19,159	19,405	19,995	20,929	20,777	22,288	26,793	26,678	26,186	25,124
Growth (real)		4.69%	4.77%	4.09%	1.29%	3.04%	4.67%	-0.72%	7.27%	20.21%	-0.43%	-1.85%	-4.06%

Source: 2009-10 PBS and earlier Defence Annual Reports (DAR)

When calculating the real growth rate, the nominal dollar values of the individual years have been converted to a single base year using the deflator used to maintain Defence buying power in real terms. Since 2001-02 this has been the implicit Non-Farm GDP Deflator (NFGDPD). Specifically, we have used the historical Defence deflator for the first year, and the actual and Treasury-projected NFGDPD up to 2010-11. Beyond that, we have used the deflators implied by Table 4 on page 18 of the PBS, there being no official public estimates past 2010-11. Specifically across the budget year and forward estimates we have used: (-1.0%, 1.5%, 1.75%, and 1.85%). Note that the last two figures are far from certain.

The average *arithmetic* annual rate of real growth in the budget over the decade from 2000-01 (the last year prior to the 2000 White Paper) is 4.9%. Over the same period, the effective *compounding* annual rate of real growth is slightly less at 4.1%. Thus, by either measure, it looks like the 3% real growth funding trajectory set back in 2000 will be more than achieved.

Over the next four years average *arithmetic* annual rate of real growth in the budget will be 3.5% and the effective *compounding* annual rate of real growth will be 3%. However, these figures must to be viewed with some caution given the very large shifts due to foreign exchange and other factors. If we were to use the 2.5% fixed indexation promised by the 2009 White Paper a lesser rate of growth would result because of the relatively low values of the NFGDPD prevailing. Defence funding is explored at length in Section 3 of this brief.

What is the Defence share of GDP?

Table 2.2.2 gives Net Defence Funding as a percentage of GDP for recent and future years. In 2009-10, the share of GDP will be 2.3% due to rising real spending and a contracting economy. Over the following three years, falling real spending and a rising economy will push the share of GDP down again.

Table 2.2.2: Net Defence Funding as a percentage of GDP

	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13
% GDP	1.79%	1.79%	1.82%	1.83%	1.81%	1.81%	1.83%	1.75%	1.88%	2.28%	2.21%	2.08%	1.91%

Source: 2009-10 Budget Overview, 2009-10 PBS and earlier DAR

What is the Defence share of Commonwealth payments?

Defence spending as a percentage of total Commonwealth payments is shown in Table 2.2.3. On current plans, Defence's share of payments will rise slightly before falling back at the end of the forward estimates period.

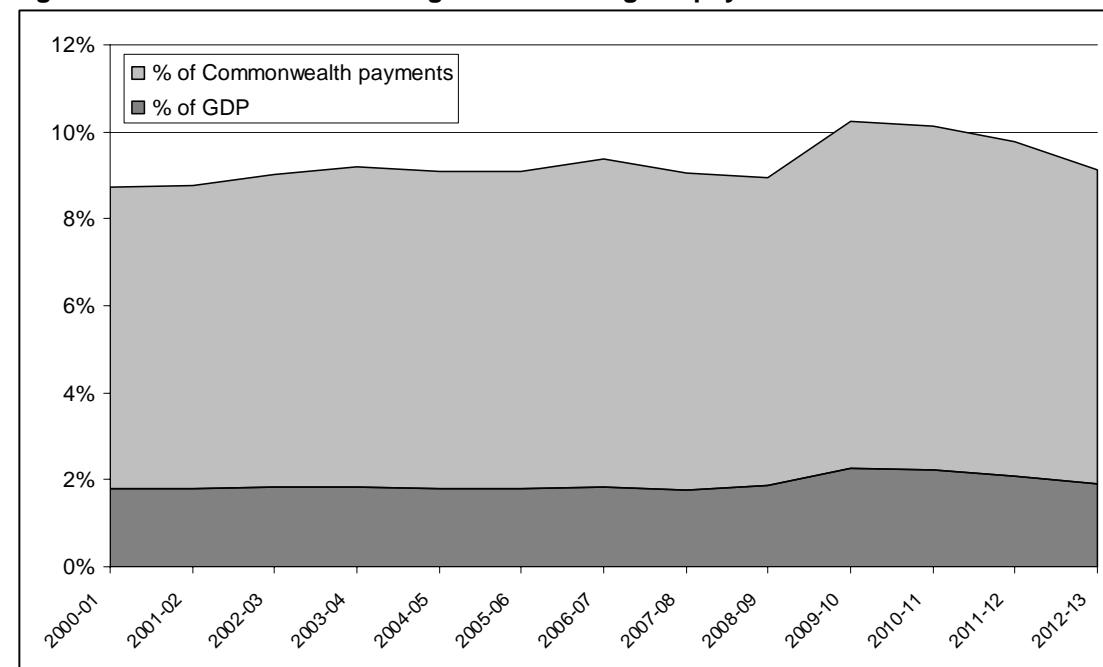
Table 2.2.3: Net Defence Funding as a percentage of Commonwealth payments

	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13
% Pay	6.96%	6.99%	7.21%	7.36%	7.29%	7.30%	7.56%	7.30%	7.07%	7.96%	7.91%	7.68%	7.23%

Source: 2009-10 Budget Overview, 2009-10 PBS and earlier DAR

Figure 2.2.1 graphs the percentage GDP and share of Commonwealth payments from 2000 to 2012. Note that the increase in both quantities coincides with the recession.

Figure 2.2.1: Net Defence Funding as a Percentage of payments and GDP



Source: 2009-10 Budget Overview, 2009-10 PBS and earlier DAR

Changes since the last budget

Since the last budget, a number of significant initiatives have been undertaken that provide context for this year's budget. Table 2.2.4 shows the key initiatives from the 2008-09 Portfolio Additional Estimates Statement (PAES) [Table 1.1.1, p.8].

Table 2.2.4: Key initiatives from the 2008-9 PAES (million \$)

	08-09	09-10	10-11	11-12	4 year total	10 year total
Operational supplementation	135.2				135.2	135.2
Reprogramming of Enhanced Land Force (ELF)	-207.8	-69.4	9.7	231.2	-36.3	17.6
Reprogramming of the Approved Major Capital Investment Program	-541	-	217.5	-564.0	-860.5	-5.5
Bring forward of 2007-08 reprogramming	307.0				307	-31.2
TOTAL	-306.6	-69.4	227.2	-332.8	-454.6	116.1

Source: 2008-09 PAES. Note: does not include price and exchange or minor adjustments/measures.

Operational supplementation

Additional funding was made available for operations in Iraq (\$92.3 million) and Afghanistan (\$3 million), as well as for infrastructure in the Middle East (\$15.5 million). In addition, \$5.1 million was taken back due to a reduction of personnel in East Timor from 750 to 650, and \$29.4 million was provided to adjust for 2007-08 deployment costs.

Reprogramming of Enhanced Land Force (ELF)

In August 2006 it was announced that the Army would expand through the addition of two light infantry battalions. At that time, the total cost of additional personnel, equipment, facilities and operating expenses was estimated to be about \$10 billion. The expansion is planned to occur in two phases, each of which builds upon the \$1.5 billion Hardened and Networked Army (HNA) measure announced in 2005.

Stage 1 of the Army expansion was approved in late 2006 at a cost of \$4.1 billion over eleven years. Included in this first stage were the design and development of facilities for both stages and the acquisition of more than 100 additional Bushmaster Infantry Mobility Vehicles. This first battalion is planned to be manned by the end of 2008 and ready to deploy overseas by 2010. In late 2007, the second stage of the Enhanced Land Force was approved and \$4.4 billion was committed over ten years. The second battalion was raised in 2008, will achieve an operational capability by 2010 and be fully deployable by 2011.

The inability to initiate facilities construction associated with the ELF initiative caused \$207.8 million to be programmed out of 2008-09 into future years.

Reprogramming of Major Capital Equipment

Because of delays in acquisition projects, net major capital investment funding of \$860.5 million was reprogrammed from the budget year and forward estimates into the future. These and other recent reprogramming adjustments are detailed in Table 2.2.5.

Table 2.2.5: Shifts to the major capital investment program (million \$)

	06-07	07-08	08-09	09-10	10-11	11-12	12-13	13-14	post 13-14
2006-07 PAES									
approved/unapproved	-390	112	288						
2007-08 PBS									
approved/unapproved		-615		631					
further approved		-378	-230	-559	38	193	543	382	120
2007-08 PAES									
approved			101		-522		436		
DMO reprogramming*		-440	93.5	?	?	?	?	?	?
2008-09 PBS									
approved			-1,066	-181	-276	-245	84	573	1,308
unapproved			-45					49	
further unapproved				-500	253	259			
2007-08 underspend		-156					52*	52*	52*
2008-09 PAES									
approved			-514		217	-564	98	-35	792

Source: Defence PBS and PAES (*2007-08 reprogramming estimated only)

*not disclosed in Defence budget papers but mentioned in DMO section

Table 2.2.5 includes an additional \$440 million of deferrals from 2007-08 that appear on DMO's accounts but which have not been disclosed in Defence's presentation. Insufficient information exists to tell if earlier major capital investment program deferrals within DMO have not been reflected in Defence's accounts. A more detailed discussion of delays in the major capital investment program appears in Section 3 of this brief.

Bringing forward of 2007-08 reprogramming

In the 2008-09 Budget, \$679.7 million of unspent funds from 2007-08 were reprogrammed to 2012-13 and beyond. In the 2008-09 PAES, \$307 million of non-capital investment funds were brought back into 2008-09 to meet emerging but unspecified budget pressures.

The 2009-10 Budget Measures and Adjustments [PBS p. 16 – 21]

Changes to the 2009-10 Defence budget are set out in the PBS. The changes fall into two categories: budget measures and budget adjustments. The formal distinction between budget measures and budget adjustments is that the former are detailed in the Treasury budget papers and the later are not. In practice, the distinction is variable, with identical items classified differently from one year to the next.

There are twenty budget measures and three adjustments in this year's budget, which are detailed on pages 15, 16, 17, 18, 22 and 23 of the PBS.

For ease of reference, the individual measures and adjustments have been detailed in Table 2.2.6. For simplicity, we have included the three DMO measures from page 113 of the PBS. There are only thirteen budget measures that actually impact the budget bottom line. Of these, two take away money and another reprograms money from the forward estimates period into the future. In the budget year, the net impact of the seven measures is to add \$1,486 million. Across the four years including the forward estimates, the net result is a loss of \$134 million. It is only by moving to the ten year horizon that the impact crosses into positive territory—convincingly so with a net increase of \$10.7 billion over the decade. The remaining measures are what are termed 'absorbed measures'—things that Defence has to do without additional funding. They amount to \$584 million over the next four years and \$1.7 billion over the decade.

The budget initiatives in detail

The PBS does a reasonable job of explaining the measures related to ADF deployments, (p. 28-29). However, since 2005-06, routine budget measures have not been described in the PBS. We rectify this below, drawing very heavily on the descriptions from Treasury's Budget Paper Number 2 – sometimes verbatim. For this reason, some descriptions are somewhat effusive about their own merits.

Defence White Paper — new funding model

A new long-term funding model has been introduced for Defence, consistent with the plan set out in the 2009 Defence White Paper. Over the next decade, the new funding model will provide Defence with total funding of \$308 billion. Over the period to 2029-30, the government will provide additional new funding of \$146.1 billion to Defence (against funding projections for Defence at the time of the *Updated Economic and Fiscal Outlook*), by:

Table 2.2.6: 2008-09 Budget Measures and Adjustments (million \$)

	2009-10	2010-11	2011-12	2012-13	4 year total	10 year total
Funded Measures – non deployment						
Defence White Paper – New Funding Model					0	10,754
Defence savings in the forward estimates	-0	-100	-200	-1,700	-2,000	-2,000
Reduced medial interviews for superannuation	-0.5	-0.5	-0.5	-0.5	-2	-4.9
Enhanced crisis coordination	1.7				1.7	1.7
Decisions yet to be announced	1.5					1.5
Funded Measures - deployments						
Afghanistan	1083.6	118.7	49.2		1251.6	1252
Afghanistan – Afghan Army Trust Fund	59.3	59.3	59.3	59.3	237.4	297
East Timor	191.8	18.9	0.4		211.1	211.1
Iraq – Baghdad	59.2	12.0	2.3		73.5	74
Iraq – cessation of embedded forces	-49.5				-49.5	-49.5
Solomon Islands	29.3				29.3	29.3
Coastal Surveillance	-0.3	2.0			1.7	1.7
Middle East command and control	87.5				87.5	87.5
Superannuation on deployment	22.5				22.5	22.5
subtotal	1,486.3	110.4	-89.3	-1641.2	-133.8	10,677
Adjustments						
Price indexation	-528.0	-197.4	-64.8	-39.4	-829.5	1,936
Foreign exchange	138.1	147.7	186.4	162.2	643.3	1,512
Transfer of DMO Service Fee	-758.7	-775.2	-802.9	-832.2	-3,169.0	-8,750
subtotal	-1448.6	-824.9	-681.3	-709.4	-3,364.2	-5,301
Variation to Defence funding	337.7	-714.5	-770.6	-2350.5	-3498.0	5,375
Absorbed measures						
Navy workforce – increased capacity	?	?	?	?	405.3	1,500
Land Operations in Complex Environments	?	?	?	?	70.8	70.8
ADF health care trial – expansion	?	?	?	0	44.5	44.5
Retention of accommodation on deployment	?	?	?	?	30.9	30.9
Global supply chain opportunities	?	?	?	?	15.3	15.3
Industry centres of excellence	?	?	?	?	9.2	9.2
Australia -US disaster relief cooperation	?	?	?	?	7.7	7.7
Critical infrastructure protection - continuation	1.7	?	?	?	1.7	1.7
Total absorbed measures	?	?	?	?	585.4	1,680

Source: 2008-09 PBS and Budget Paper #2. Numbers may not add due to rounding. Note: 10 years figures for absorbed measures assume (conservatively) no extension past 2012-13 unless confirmed otherwise.

- continuing the commitment to grow underlying Defence funding by 3% on average in real terms to 2017-18, with 2.2% average real growth per annum thereafter to 2029-30
- providing fixed indexation at 2.5% each year to 2029-30, which accords with the target for consumer price inflation agreed by the Australian Government and the Reserve Bank of Australia, for the purposes of Defence planning
- implementing a comprehensive program of reform, efficiencies and savings, generating around \$20 billion worth of savings over 10 years
- reprogramming existing capital acquisitions to meet the new strategic assessment and timetable in the 2009 Defence White Paper

- instituting a commitment by Defence to meet any shortfalls in the White Paper through further internal efficiencies within Defence.

The new funding model will apply from 1 July 2009, with increases resulting from this new indexation over the forward estimates being returned from 2016-17 onwards, in line with Defence's acquisition timetable for *Force 2030*. (As best we can estimate, this amounts to around \$5.3 billion dollars of deferred funding.)

Defence funding will transition to the new long-term path over 2013-14 and 2014-15. Funding will be \$1 billion below the new long-term funding path in 2013-14, and \$500 million lower in 2014-15 as higher funding levels are phased in. These amounts will be added back to the Defence budget from 2016-17 onwards.

Defence savings in the forward estimates period

Savings of \$2 billion over three years from 2010-11 will be withdrawn from the Defence budget and returned in the period beyond 2015-16.

Military superannuation schemes — reduced number of medical reviews

The number of medical reviews required each year for the ongoing classification of invalidity pensioners in the military superannuation schemes will be reduced. This measure will provide savings of \$2.0 million over four years and \$4.9 million over ten years.

Enhanced crisis coordination facilities (cross-portfolio measure)

The government will provide \$34.9 million over four years from 2009-10 (including \$18.1 million in capital funding) for enhanced crisis coordination facilities to support the capacity of the government to respond to and manage national and international emergencies. Defence will receive \$1.7 million to allow the Defence Science and Technology Organisation to support the National Crisis Coordination Centre that is being established.

Deployments

The PBS provides a reasonable discussion of the various measures that supplement Defence for the net additional cost of deployments. Key points include:

- \$1,251.6 million for the net additional cost of Australia's military contribution to efforts in Afghanistan
- \$211.1 million over three years for the net additional cost of operations in East Timor
- \$49.5 million will be returned following the end of embedded personnel operations in Iraq
- \$73.5 million for the net additional cost of the Baghdad security detachment over three years
- \$1.7 million will be provided over two years for revised coastal surveillance operations
- \$87.5 million in 2009-10 to improve efficiency in operations by consolidating support assets within the Persian Gulf region
- \$29.3 million for operations in Solomon Islands in 2009-10
- \$22.5 million for payment of superannuation on deployment allowances.

A further \$237 million has been provided over four years for an annual contribution to the Afghan National Army Trust Fund of US\$40 million (A\$59.3 million) for each of the next five years. This contribution will support the development of the Afghan National Army and strengthen its ability to provide for the security of Afghanistan.

See Section 6 of this brief for more on the cost and composition of ADF deployments.

Funding adjustments:

Price and exchange

Defence will hand back an additional \$829.5 million over four years and receive \$1,936 million over the decade as a price adjustment. To take account of foreign exchange movements, Defence will receive \$634 million over four years and \$1,512 million over ten years. These adjustments are designed to maintain the buying power of the Defence dollar. Further explanation of adjustments appears on p.23 of the PBS.

Defence Materiel Organisation (DMO) Service Fee

Defence will hand back \$3.2 billion over four years (and \$8.7 billion over ten years) amounting to the Service Fee it previously paid to DMO. In the future, DMO will be directly appropriated for this purpose from the government.

Navy workforce — increased capability (absorbed measure)

\$405.3 million will be spent over four years from 2009-10, and \$1.5 billion over the decade, to support the maintenance and development of the Australian Navy's operational capability through the provision of an additional 700 personnel. The projected personnel numbers for Navy in the PBS [Table 18] have not yet been adjusted to reflect this change—they are effectively the planned figures from last year. The additional personnel are, at least in part, contained in the unallocated personnel category (serial 9) in Table 18.

Land operations in complex environments, improved capacity (absorbed measure)

The government will provide \$70.8 million over four years (including capital funding of \$29.1 million) from 2009-10 to increase the Army's capacity to deploy specialists to conduct field intelligence and information operations in support of land operations in our region.

Australian Defence Force Health Care Trial — expansion (absorbed measure)

The government will provide \$44.5 million over three years from 2009-10 to extend the trial of the provision of basic medical and dental services to dependants of full-time ADF members. The trial will be extended to Townsville, Darwin and Puckapunyal. This expansion will build on the initial phase of the trial for Australian Defence Force dependants at the Tindal, Cairns, East Sale and Singleton bases, and in the Pilbara region. The trial provides free basic general practitioner services and free basic dental services up to a cap of \$300 per dependant per annum. The expanded trial will provide for approximately 16,000 Australian Defence Force dependants.

Retention of accommodation on deployment (absorbed measure)

\$30.9 million will be spent over four years from 2009-10 to allow eligible Australian Defence Force members to retain their rental accommodation while on deployment. This measure will apply to single members or members living away from their families who are deployed overseas for six months or longer.

Global supply chain opportunities (absorbed measure)

A total of \$15.3 million over four years from 2009-10 to assist Australian small and medium enterprises to compete for domestic and international Defence contracts. This will be achieved through training and mentoring industry with the goal of it becoming more competitive, more capable and with increased capacity to be able to compete for and win global supply chain opportunities. The cost of this measure will be met from within the existing resourcing of the Defence Materiel Organisation.

Priority Industry Capability Centres of Excellence (absorbed measure)

\$9.2 million will be spent over four years from 2009-10 to establish the Priority Industry Capability Centres of Excellence. Defence will work with industry to investigate and develop initiatives, including skilled workforce development and technology incentives that improve defence industry capability or capacity.

Australia–United States enhanced defence cooperation — humanitarian assistance and disaster relief (absorbed measure)

The government will provide \$7.7 million over four years from 2009-10 to implement the Australia–United States Humanitarian Assistance and Disaster Relief Joint Investment Program. The program will increase the ability of both countries to respond to regional natural disasters. This was agreed at the Australia–United States Ministerial Consultations in February 2008.

So what happened?

Setting aside the \$1.9 billion of operational supplementation (which is a routine occurrence), four things happened in the budget:

- a new funding model was introduced for Defence as a result of the 2009 White Paper (see Section 3 of this brief for a detailed analysis)
- a substantial savings program worth \$20 billion over the next decade was announced (see Section 4 of this brief for a detailed analysis)
- unfunded measures worth \$585 million over the next four years and \$1.7 billion over the decade were assigned to Defence
- substantial funds (we estimate around \$8.8 billion) were deferred into the future from the first six years of the budget.

Beyond these broad statements, there is not all that much more in the PBS regarding the much vaunted new White Paper funding. Most extraordinarily, any meaningful details regarding defence funding beyond the forward estimates. So while we are told that *Force 2030* represents the ‘most comprehensive White Paper of the modern era’ (which, strictly speaking, means since the Middle Ages) and that the ‘White Paper is fully costed and is affordable’, the financial facts are being withheld.

We do our best in Section 3 of this brief to work out what’s going on.

The enigma of PBS Table 3

Before we leave the discussion of Defence funding we need to address the issue of the ‘\$45b savings program’ mentioned on p. 16 of the PBS. Yes, not \$20 billion but \$45 billion!

As near as we can determine, this means that there are \$45 billion worth of initiatives that are going to be pursued in the context of the White Paper, and that \$45 billion

worth of ‘savings initiatives, reprogrammed funds and new funding from Government’ are available across the decade to achieve this. The table and some explanatory notes appear in Figure 2.2.2. We further explore the source of funds for the \$45 billion of spending in more detail in Section 4 of this brief.

Figure 2.2.2: The enigma of PBS Table 3

In part at least, the reprogramming refers to changes in the major capital equipment program. Aside from 2009-10 when \$750 million of deferrals have been disclosed, we do not know what is happening.

This includes new funding from this budget plus unallocated funds retained by Defence from previous years' budgets.

This includes \$10 billion of unfunded net personnel and operating costs, and around \$8 billion of unspecified budget shortfalls.

Unknown

Maintenance and upgrade of non-capability areas, including information technology, estate, and logistics etc.

This is the gross amount of the \$20 billion savings program announced in the 2009 White Paper.

This is money that has to be invested to enable the gross savings to be delivered.

Net savings available to be spent on other initiatives.

Presumably cost increases in the unapproved major capital program.

This implies that only \$362 m of the \$2,000 m will be returned to the budget this decade.

	2009-10 to 2012-13 estimate \$m	2009-10 to 2018-19 estimate \$m
Funding Available		
Savings		
Gross Savings	4,966.5	20,682.2
Cost of Savings	-1,463.2	-2,444.3
Net Savings	3,503.3	18,237.9
Reprogramming	4,404.6	7,852.9
► New Budget Funding	1,626.6	18,796.3
Total Funding Available	9,534.5	44,887.1
Initiatives		
Remediation		
Defence Capability Plan	750.6	5,970.4
Budget Provisions	4,058.6	17,647.6
Enterprise Backbone	1,449.8	5,721.4
Total Remediation	6,258.9	29,339.4
Other Defence Initiatives	1,275.6	13,909.4
Reprofiled Savings		
\$2bn Saving	2,000.0	2,000.0
Payback of \$2b Saving	—	-361.7
Total Reprofiled Savings	2,000.0	1,638.3
Total Initiatives	9,534.5	44,887.1

Section 2.3: Other information provided

The remainder of Chapter 2 of the PBS contains a range of information including:

- **Defence Resource Statement** [PBS p. 20–21] which lists the formal appropriation of funds to defence.
- **Purchase-Provider Arrangements** [PBS p. 25] which lists the itemised payments to DMO for goods and services rendered.
- **Operations Summary** [PBS p. 26–29] which provides some detail of the funding and composition of ADF deployments.

- **Capital Investment Program** and **Net Capital Receipts** [PBS p. 30–31] which we explore more fully in Section 2.3 of this brief.
- **People** [PBS p. 30–35] which we explore more fully in Section 2.4 of this brief.

Section 2.4: Capital Investment Program [PBS Section 1.2.3]

Information pertaining to the Capital Budget is now spread across several areas of the PBS. The Capital Budget represents Defence's plans for capital investment in new equipment, upgrades, facilities and other non-military capital items. It's formally described in accounting terms in the Capital Budget Statement in Table 47 on page 105 of the PBS, although that is not very revealing.

Capital Investment Program [PBS p.30]

The capital investment program is detailed in Table 16 page 30, which we have reproduced in part in Table 2.4.1. Unfortunately, the projected result for 2008-09 has not been included in this year's PBS so we have been forced to use the revised estimate from the 2008-09 PAES.

Table 2.4.1: The Capital Investment Program (million \$)

\$ million	05-06 actual budget	06-07 actual budget	07-08 actual budget	08-09 actual budget	09-10	10-11	11-12	12-13
Not Yet Approved Major Capital Equipment (DCP)				405.7 188.2	631.5	1,433.7	2,231.9	2,271.7
Approved Major capital Equipment	3,888.4 3,747.8	4,019.0 4,735.0	4,030.0 4,807.5	4,419.9 4,321.2	5,153.1	5,034.1	4,163.6	2,921.9
Subtotal actual - budget	3,888.4 3,747.8 +140.6	4,019.0 4,735.0 -716.0	4,030.0 4,807.5 -777.5	4,825.6 4,509.4 -316.2	5,784.6	6,467.8	6,395.5	5,193.6
Capital Facilities Approved & Unapproved	430.3 447.1	653.4 491.3	569.7 643.6	838.3 758.3	1,443.9	1,670.4	1,647.4	1,087.4
Other Capital	722.4 582.7	925.0 527.9	829.4 768.8	757.4 858.2	689.3	744.6	675.7	509.2
Total Capital Investment Program	5,041.1 4,777.6	5,597.5 5,754.2	5,429.1 6,219.9	6,421.4 6,125.9	7,917.7	8,882.7	8,718.6	6,790.2

Source: 2009-10 PBS, DAR, 2008-09 PAES, 2007-08 PAES

There are four components to the Capital Investment Program:

Not Yet Approved Major Capital Equipment or Defence Capability Plan (DCP)

This represents Major Capital Equipment projects that have not yet received second pass approval from government. Major Capital Equipment projects are generally of more than \$50 million value and predominantly involve the purchase of military equipment, (previously called 'Pink Book' projects). The preparation of these projects for approval is the responsibility of the Chief of the Capability Development Executive. Once approved, projects pass to the DMO for delivery.

Approved Major Capital Equipment: Projects already approved by government and under way. (Previously called the ‘White Book’). The delivery of these projects is mostly the responsibility of the Defence Materiel Organisation.

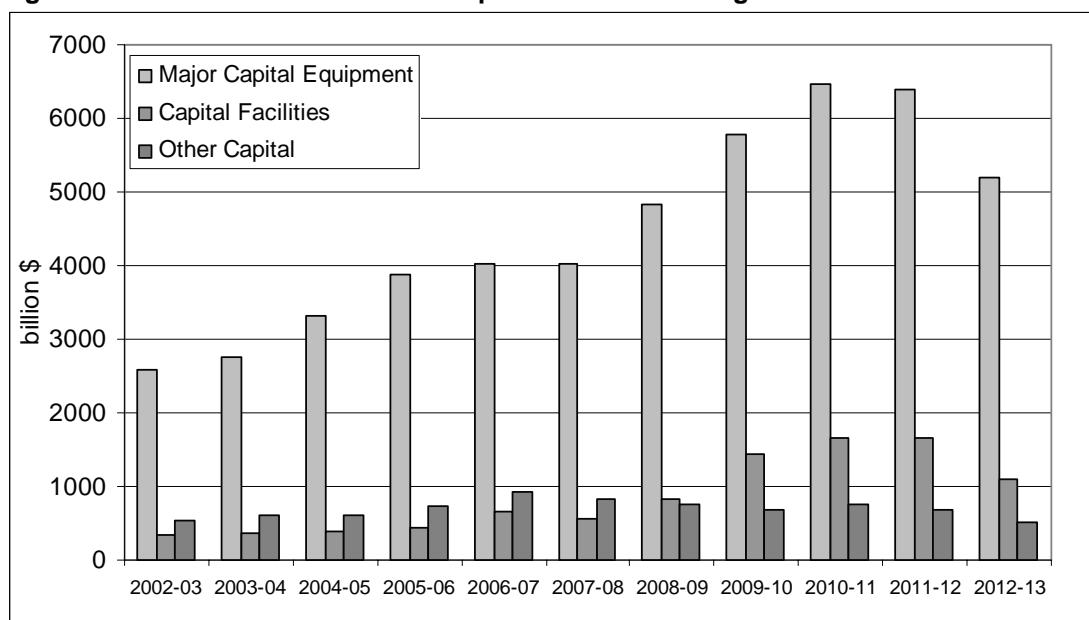
Capital Facilities: Approved and Unapproved Capital Facilities Projects, including everything from new barracks to upgrades of existing facilities. These projects are the responsibility of the Infrastructure Division in the Defence Support Group.

Other Capital: including Minor Capital Equipment (projects costing less than \$20 million), repairable items, non-capital facilities, plant and equipment, and software and intangibles.

What are the trends in the Capital Investment Program?

The trend across the forward estimates is for an increase (in nominal dollars) in the Capital Investment Program from \$6.5 billion in 2008-09 to \$8.7 billion in 2011-12, followed by a fall in 2012-13. Within these amounts, expenditure on Capital Facilities and Other Capital fluctuates while the spending on major capital equipment rises to a peak in 2010-11 and then falls away (Figure 2.4.1). As near as we can tell, this reflects the peak in spending associated with the F/A-18 Super Hornet Amphibious vessel acquisitions.

Figure 2.4.1: Planned trends in the Capital Investment Program



Source: 2009-10 PBS and 2008-09 PAES and previous DAR

Investment in Major Capital Equipment would have been higher than presently planned but for a deferral of investment into the future that occurred between the 2008-09 PAES and the 2009-10 Budget. Unfortunately, in a marked departure from previous practice, information on the scale and timing of the latest round of deferrals has been withheld. The single datum we have is that \$749.4 million has been deferred from 2009-10 into undisclosed future years.

Comparing present levels of planned investment in Major Capital Equipment from the 2009-10 PBS with those from the 2008-09 PAES does not yield a reliable indication of deferrals in subsequent years because of large foreign exchange and price

adjustments. The only hint we have is that PBS Table 47 (which bears a footnote saying an update is pending due to a late change) presents a capital budget that is \$3,486 higher over the four years of the budget and forward estimates than in the PBS Table 16. It is difficult to know what conclusion to draw from this.

Operating Component of Capital Investment

Not all of the money in the Capital Investment Program actually represents capital investment. There's also an Operating Component of Capital Investment that includes those funds treated as expenses in the process of acquiring the capital equipment or facilities. This includes project office costs, studies, research and development, travel, professional service providers and other overheads.

The operating component of capital investment is not evenly spread across the four components of the capital program, nor is it constant in time (see Table 2.4.2). Given the reduced information in the PBS we can only present aggregate figures this year. The mix of funding will continue to change reflecting project throughput and the individual circumstances of each project. The operating component of the major capital equipment program will probably fall given the number of very large projects anticipated including the two massive Foreign Military Sale purchases from the United States; the F/A-18 Super Hornets and the C-17 strategic transports.

Table 2.4.2: Percentage of operating component in Capital Investment Program

	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13
Major Capital Equipment	9.8%	13.6%	17.9%	13.9%	13.6%	14.7%					
Capital Facilities	0.0%	4.8%	14.8%	11.7%	11.5%	3.6%	7.8%	7.2%	4.6%	5.0%	5.8%
Other Capital	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%					

Source: various DAR, 2007-08 PBS and 2008-09 PBS

Unapproved Major Capital Equipment Program [PBS page 78] and Approved Major Capital Equipment Program [PBS page 137]

The PBS contains a list of DCP projects planned for first or second pass approval in 2009-10 [Tables 33 and 34, p. 77-78]. The approved capital equipment program is mainly, but not exclusively, the responsibility of DMO. As a result, most of the information on approved projects can be found in the DMO section of the PBS, including details of the top 30 projects. We examine the Capital Equipment Program more closely in Sections 2.7 of this Brief.

Facilities Projects [PBS pp.57-66]

The PBS lists 66 approved Capital Facilities Projects. This includes 44 major projects (worth \$15 million each or more) with a total value \$3.921 billion, and 22 medium projects of between \$25,000 and \$15 million with a total value \$142.4 million. In the 2009-10 Budget the government has foreshadowed 6 new major capital works projects for parliamentary consideration and 22 medium capital works projects. These are listed in Table 29 and Table 32 of the PBS respectively. Expenditure on facilities projects in 2008-09 is planned to be \$1.4 billion compared with \$830 million in 2008-09.

Table 28 of the PBS lists the approved major facilities projects. The largest such projects are the Enhanced Land Force facilities at various locations (\$793 million),

RAAF Amberley Redevelopment (\$332 million) and Heavy Airlift Capability facilities (\$268 million), the development of Special Forces working accommodation and base redevelopment at Holsworthy (\$208 million) and the redevelopment of RAAF Pearce (\$142 million) and RAAF Williamtown (\$133 million).

Table 30 on page 64 of the PBS lists 17 future possible private financing projects that are under development as part of the Single Leap initiative. Defence's program of approved and yet-to-be-approved facilities projects is called the Green Book. It used to be found on the Defence web site but no longer appears to be publicly available.

Other Capital Purchases

Other capital purchases include Minor Capital Equipment, Repairable Items and Other Plant and Equipment. Defence plans to spend \$689 million on other capital purchases in 2009-10.

Capital Sales and Receipts [PBS page 31]

The capital budget is funded in part through the proceeds from sales of property, plant and equipment and other capital receipts. On a year by year basis some or all of this money is returned to the government through a capital withdrawal. This is taken into account in determining the appropriations to Defence. Table 2.4.3 shows recently planned and achieved assets sales (including both property and other assets) within the Defence Capital Budget.

Table 2.4.3: Capital Budget Asset Sales (\$ million)

	Budgeted	Achieved	Shortfall
DRP to June 2000	—	77	—
2000-01	820	87	733
2001-02	1023	199	824
2002-03	700	632	68
2003-04	306	184	122
2004-05	231	143	88
2005-06	95	108	-13
2006-07	38	134	-96
2007-08	99	65	-34
2008-09	285	285	0
2009-10	287		
2010-11	161		
2011-12	75		
2012-13	170		

Source: Defence Annual Reports, 2008-09 PAES, 2009-10 PBS

Note: 2008-09 result revised estimate only.

Section 2.5: People [PBS Section 1.2.3]

Overview [PBS p. 31]

The Overview of the PBS 'People' chapter outlines the scale and importance of personnel in Defence in under a page.

From a budget perspective there is a lot more to be said. Since 2000 there have been a range of initiatives to improve the management of personnel from a business and planning perspective, and to enhance the development, care, recruitment and retention of personnel. Many of these initiatives began in 2001-02, when \$500 million was allocated over five years to deal with high priority personnel issues. More recently, in the 2006-07 budget, there were two further personnel measures. First, \$182 million was provided over four years for enhanced Reserve remuneration. Second, \$194 million was allocated to improve recruitment and retention.

Then, in late 2006, the then government allocated another \$1 billion for recruitment and retention over ten years, and in last year's budget a further \$2.1 billion was made available. This year's budget contained three personnel-related measures: retention of accommodation for members on deployment (\$30.9 million over four years); an extension of the ADF family health care trial (\$44.5 million over four years) and the boost to Navy's personnel numbers of 700 (\$405 million over four years).

How big is the workforce?

The establishment of DMO as a prescribed agency complicates the reporting of personnel numbers especially given the different accounting for civilian and military personnel and costs that has been adopted. We've collected together the figures for the entire workforce from the Defence section on page 31 of the PBS and the DMO section on page 131, see Table 2.5.1. (We examine the DMO workforce in Section 2.7 of this brief.)

Table 2.5.1: Workforce summary for Defence plus DMO (average funded strength)

	01-02 actual	02-03 actual	03-04 actual	04-05 actual	05-06 actual	06-07 actual	07-08	08-09	09-10	10-11	11-12	12-13
Navy	12,598	12,847	13,133	13,089	12,767	12,690	12,882	13,227	13,635	13,721	13,718	13,723
Army	25,012	25,587	25,446	25,356	25,241	25,525	26,666	27,824	28,126	28,683	29,427	29,807
Air Force	13,322	13,646	13,455	13,368	13,143	13,289	13,608	14,067	14,010	14,060	14,954	13,990
TOTAL	50,932	52,080	52,034	51,813	51,151	51,504	53,156	55,118	55,771	56,464	57,099	57,520
Active Reserve	18,868	19,620	20,488	19,275	19,464	19,562	18,200	18,902	18,950	19,100	19,200	19,300
High Readiness	-	-	-	-	-	-	-	1,124	1,680	1,960	2,160	2,205
Total Reserve	18,868	19,620	20,488	19,275	19,464	19,562	20,340	20,026	21,630	21,060	21,360	21,505
Defence	16,819	18,385	18,303	13,390	13,577	14,516	15,228	14,534	14,828	14,841	14,822	14,821
DMO	-	-	-	4,363	4,502	4,951	5,567	5,496	5,764	5,858	5,951	6,116
Civilian	16,819	18,385	18,303	17,753	18,079	19,467	20,795	20,020	20,592	20,699	20,773	20,937
PSP	-	2,311	1,88	1,913	1,651	1,108	801	700	1,320	1,315	1,312	1,312
White Paper Unassigned									1,009	1,252	621	242

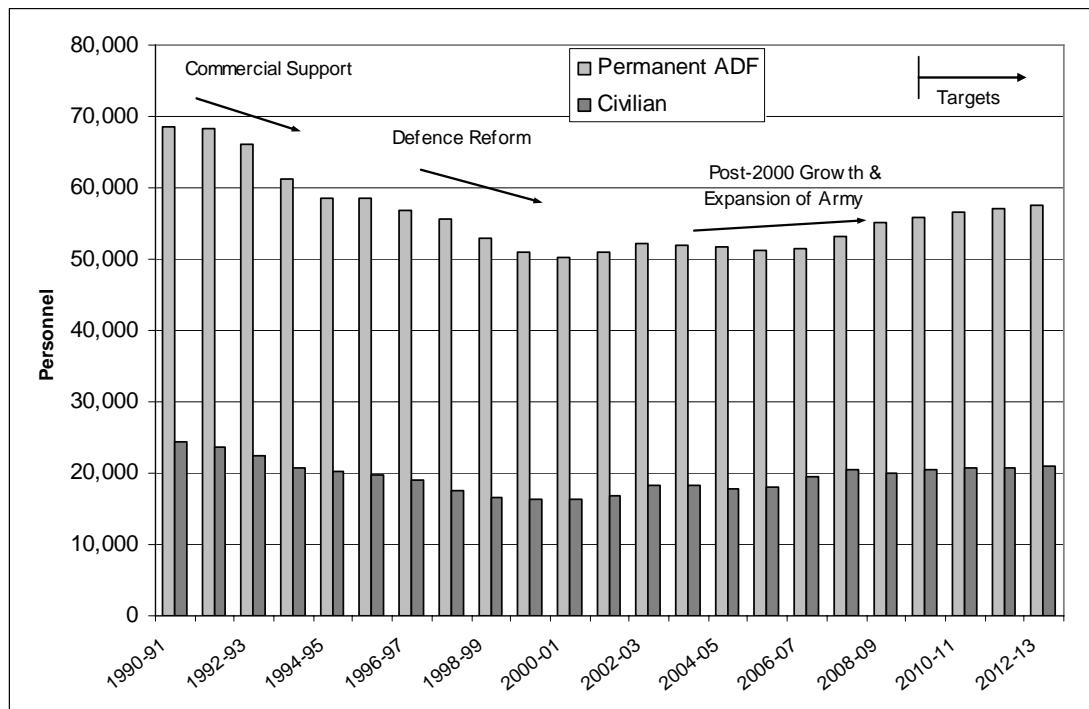
Source: Defence Annual Reports, 2009-10 PBS.

In 2009–10 Defence will be funded to maintain an average of around 55,771 full time military personnel, 20,592 civilians (including 5,764 in DMO) and 21,630 Reservists. In addition, there will be 1,320 Professional Service Providers, including 164 in DMO, plus 1,009 unassigned extra personnel due to the 2009 White Paper and Strategic Reform Program.

How did we get to this point?

During the 1990s ADF numbers dropped from around 70,000 to 50,000 permanent personnel, as shown in Figure 2.5.1. Over the same period civilian numbers dropped from around 24,400 to 16,300.

Figure 2.5.1 Historical Defence Workforce



Source: Defence Annual Reports, 2001-02 Defence Budget Brief and 2009-10 PBS

The bulk of these reductions were due to outsourcing under the Commercial Support and Defence Reform programs (although around 5,600 permanent ADF positions had already been transferred to the Reserve by the 1991 Force Structure Review). In fact, the initial goal of the Defence Reform Program (DRP) was to reduce the strength of the ADF to 43,500 but this was soon revised up to 50,000, thereby arresting the decline. This was done by re-directing DRP savings to buy-back the ADF positions, the goal being to redirect personnel from support areas to the combat force.

The 2000 White Paper then set permanent ADF numbers on a growth path. Until 2003, the target was to build a force of ‘around 54,000’ permanent ADF personnel by 2010. However, the government accepted the recommendations of the 2003 Defence Capability Review, which will see some capabilities withdrawn from service in the next decade. As a result, the 2004-05 PBS [p.5] referred to ‘continued growth of the ADF towards 53,000’. However, subsequent budgets and the 2009 Defence White Paper added additional personnel for a range of initiatives including, most especially, the expansion of the Army. We will do our best to explain this revised figure later in this section. According to the 2009 Defence White Paper, the full-time ADF will grow

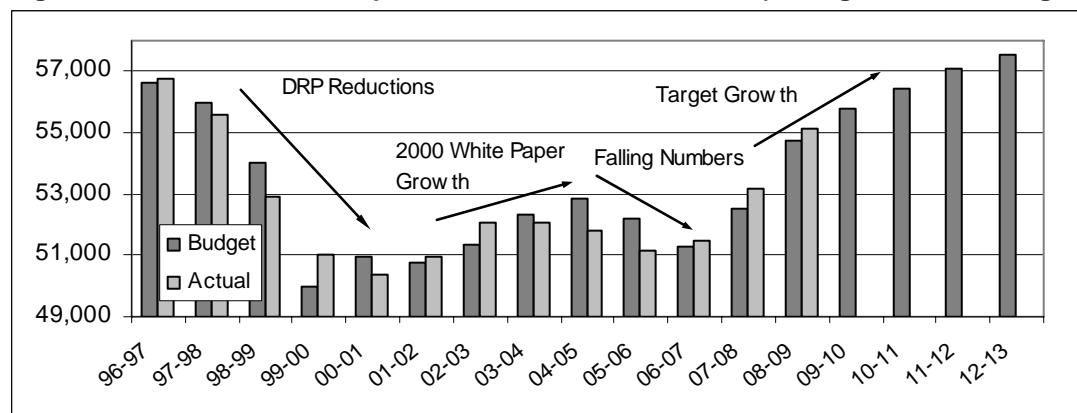
to approximately 57,800 over the next decade. Over the same period, the civilian workforce will grow to 21,900. Prior to the 2009 White Paper, the current target strengths for the permanent ADF were 57,500 by 2011-12 and ‘to more than 57,000 over the decade’.

What are the recent trends?

Permanent ADF Numbers

The changing size of the permanent ADF is captured in Figure 2.5.2. In the initial years following the 2000 White Paper, permanent ADF numbers grew steadily until 2003-04 when poor recruiting outcomes saw numbers fall for three years in a row—notwithstanding budgeting for growth in each case. Then, in 2006-07, numbers began to rise to the extent that budget estimates were exceeded two years in a row. All signs are that the revamp of recruiting and retention policy (and a lot of extra money) is slowly but steadily turning around the personnel situation. Note that for three years in a row the ADF has increased its numbers faster than anticipated. This is a good outcome.

Figure 2.5.2 Permanent ADF personnel: 1996-97 to 2012-13 (average funded strength)



Source: Defence Annual Reports, 2001-02 Defence Budget Brief and 2009-10 PBS

Unfortunately, the improved numbers have not been shared equally between the three services. Army has done best, exceeding its target for 2008-09 by 363 to register an increase of 1,213 personnel. Air Force grew by 446 personnel which is 11 positions over what was planned. Navy’s strength grew by 292, roughly as planned.

Over the next four years the permanent ADF is planned to increase by around 2,402 people including: Navy (496); Army (1,983) and Air Force (-77). As discussed in Section 2.2 of this brief, the 2009 Defence White Paper announced that naval personnel numbers will increase by a further 700 personnel. However, this is not reflected in the PBS projections.

The annual change in ADF strength is the difference between the numbers of people recruited into and separated from the force (typically around 5,000 in each case). Since the planned change in strength is usually no more than 1,000, the outcome is finely balanced. With this in mind, we turn now to examine ADF recruitment and separations.

Recruitment

Table 2.5.2 shows the percentages of recruitment targets that have been met over the

last twelve years. Following solid improvements earlier this decade, which saw the rate grow from 76% to 93% in 2001-02, performance dropped back to the mid-80% in 2002-03 and 2003-04 before deteriorating to 80% in 2004-05 and then recovering to 84% for the next two years. In 2008-09 the result fell to almost a 13-year low.

Table 2.5.2: Percentage of recruitment targets met

	95/96	96/97	97/98	98-99	99-00	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08
Navy	98%	92%	98%	76%	57%	74%	85%	84%	86%	73%	72%	78%	73%
Army	99%	98%	94%	78.5%	83%	79%	100%	79%	84%	81%	98%	86%	76%
Air Force	86%	93%	101%	90.5%	83%	88%	87%	94%	90%	91%	88%	86%	85%
ADF	96%	94%	97%	80%	76%	80%	93%	84%	86%	80%	84%	84%	77%

Source: Defence Annual Reports and Defence submission to the FAD&T References Committee inquiry into ADF recruitment and retention, May 2001.

It is important to note that recruitment results vary from Service to Service, and that within each Service skilled personnel (like technicians and trades people) are particularly hard to recruit. This no doubt reflects the very buoyant labour market and the national skilled labour shortage that Australia is experiencing. As the data shows, Navy has the most serious problem at the moment.

Retention

Table 2.5.3 shows the percentages of ADF personnel who separated from full-time military service over the last thirteen years. Some care must be taken with this data because figures for earlier years were impacted by the deliberate reduction in the size of the ADF between 1997 and 2001 under the Defence Reform Program. Still, separation rates from 2001-02 to 2004-05 were better than in 1995-96 before the cuts to personnel commenced. The most recent result of 10.6% is respectable by historical standards.

Table 2.5.3: ADF separation rates

	95/96	96/97	97/98	98-99	99-00	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08
Navy	13.0%	11.5%	11.1%	12.6%	13.3%	13.2%	11.5%	11.6%	10.1%	12.2%	11.3%	12.2%	10.8%
Army	12.5%	10.4%	10.9%	12.9%	13.0%	13.2%	11.5%	9.8%	11.0%	12.7%	12.4%	11.6%	11.6%
Air Force	9.0%	9.0%	10.0%	11.9%	11.6%	15.6%	10.4%	8.1%	7.4%	8.4%	8.5%	9.0%	8.1%
ADF	11.6%	10.3%	10.7%	12.6%	12.7%	13.8%	11.2%	9.8%	9.9%	11.5%	10.7%	11.1%	10.6%

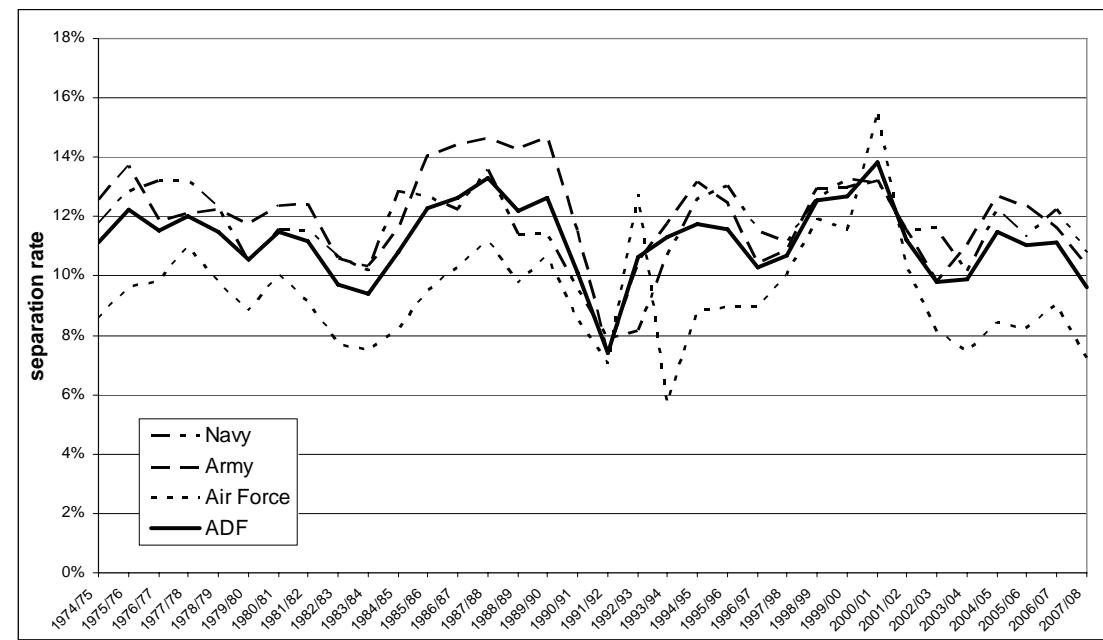
Source: Defence Annual Reports and Defence submission to the FAD&T References Committee inquiry into ADF recruitment and retention, May 2001.

To put the recent ADF separation rate in context, Figure 2.5.3 plots the separation rate over the past thirty years. The key point to notice is that the current separation rate is commensurate with that achieved over the past three decades. Given that a number of factors have arisen in that time to make long-term ADF service more difficult—growing numbers of employed spouses, greater geographical dispersal of the ADF and the trend in society to shorter-term employment—the fact that the ADF is keeping people on average for the same length of time as in the 1970s is a real achievement. It follows that the ADF's problem with personnel numbers is principally a recruitment problem.

That is not to deny that retention is an issue in particular categories and ranks. The strong demand for skilled workers in the broader economy has, until recently, been

driving up wages in areas like the trades and engineering that Defence requires to keep its high-tech capability edge. Fortunately, remuneration arrangements are being revamped to give Defence more agility to respond to market forces so that it can retain critical personnel beyond the present recession.

Figure 2.5.3: Permanent ADF separation rate: 1974-75 to 2007-08

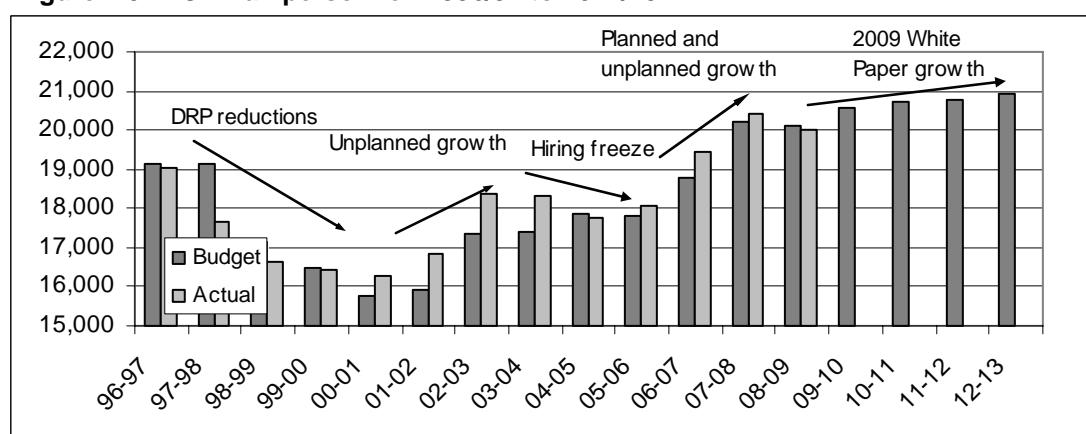


Source: DAR 1974-75 to 2007-08

Civilian Numbers

The situation with civilian numbers is captured in Figure 2.5.4 which plots budgeted and actual civilian numbers from 1996-07 onwards. Although civilian numbers fell quickly under the Defence Reform Program, they grew back very rapidly in the first two years of White Paper implementation – three times more quickly than military numbers grew. What is more, the growth was largely unplanned, with the size of the civilian workforce in 2001-02 exceeding budget estimates by 5.8% and similarly in 2002-03 (6.1% in excess). However, in January 2003 a civilian hiring freeze was imposed within Defence after it became clear that the projected number of civilian personnel would exceed the revised estimate given less than two months earlier.

Figure 2.5.4: Civilian personnel: 1996/97 to 2012/13



Source: Defence Annual Reports, 2001-02 Defence Budget Brief and 2009-10 PBS

In April 2003, the freeze was lifted but direction was given to maintain civilian numbers at current levels. The move to stem the rise in civilian numbers was understandable given that additional personnel must be funded from within current Defence funding unless linked explicitly to a specific government-funded initiative. In the 2003-04 Budget, a programmed reduction plan was set in place to reduce civilian numbers by 1,008 from 18,385 to 17,377.

However, the actual result for 2003-04 came out at 18,303 only 82 positions below the previous year's figure due, mainly, to a series of government initiatives but also because of an extra 349 new civilian positions unrelated to government initiatives or more efficient practices.

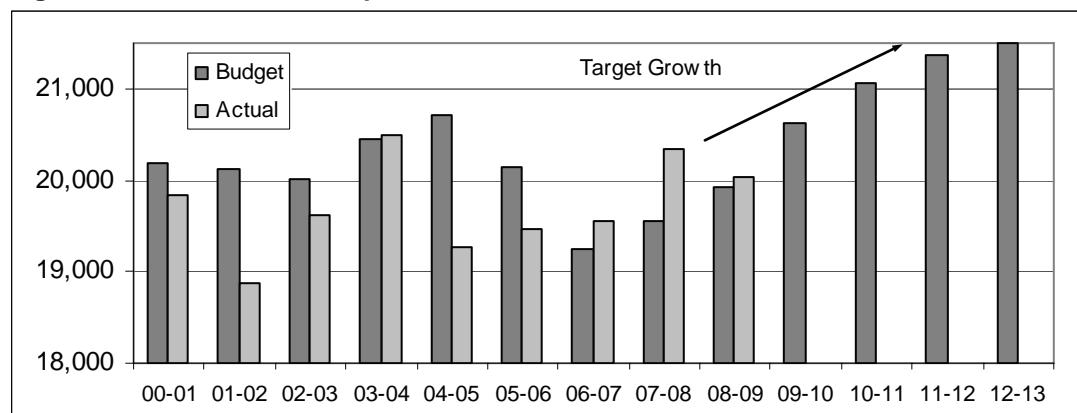
For a while, in 2004-05 and 2005-06, personnel numbers were largely under control resulting in a close alignment of budgeted and actual figures. In 2006-07, civilian personnel numbers were set to rise by 950. Most, but not all, of these positions were related directly to either new government initiatives or the creation of a more efficient workforce. However, the actual result for 2006-07 was an increase of 1,388 personnel, more than 450 above the estimate. Then, in 2007-08, civilian numbers grew by another 1,468, fully 155 above the initial budget estimate. Clearly, whatever constraints were imposed in 2004-05 and 2005-06 were no longer effective.

The plan for 2008-09 was for civilian numbers to fall to around 20,000 and then remain largely static across the forward estimates. However, following the 2009 White Paper civilian personnel numbers have been set on a growth target towards 21,900. Further discussion of the impact of the 2009 Defence White Paper and Strategic Reform Program appears in Section 4 of this brief.

Reserve numbers

After a period of volatility, Reserve numbers have remained constant at around 19,500 personnel for the past three years, see Figure 2.5.5. The 2009-10 PBS targets steady growth across the next four years that would see the Reserve reach 21,505 in 2012-13. Much of the growth is due to the development of Army and Air Forces High Readiness Reserves.

Figure 2.5.5 Active Reserve personnel: 2000-01 to 2006-07



Source: Defence Annual Reports and 2009-10 PBS

What is the long-term target for the permanent ADF?

To understand the target strength for the ADF requires some history. The starting point is the original post Defence Reform Program goal of a 50,000 strong ADF. A number of things have happened since then. First, in late 1999 it was announced that the ADF would grow by 3,555 personnel to bolster Air Force's deployable capability and build six full strength permanent Army battalions (up from four). Second, a series of post-9/11 counter-terrorism budget initiatives added to Army's strength. Third, the 2003 Defence Capability Review cut capability from the Navy and Air Force by retiring two FFG frigates, removing two mine hunters from service and retiring the F-111 fleet past 2010.

Then, in the 2005-06 Budget, two additional patrol boats added further personnel to Navy. Three initiatives in 2006 increased the target strength for the ADF. First, the reactivation of the two Mine Hunters added an extra 30 Navy. Second, the HNA initiative added 1,485 people to Army. Third, the restructure of ADF command and control arrangements saved 232 personnel. Since then, we've seen 2,600 people added to the long-term target (mainly in Army) to deliver two additional battalions, while another 563 new people have been added to Air Force's long-term strength due to the C-17 (86 personnel) and F/A-18F Super Hornet (477 personnel) acquisitions.

Unfortunately the 2009 Defence White Paper provides very little information on future personnel numbers apart from a promise of 700 extra for Navy and an 'end of decade' target of 57,800. This implies a cut in the long-term target for the ADF of 1,182 personnel. The recorded and estimated figures, as best we can determine, for the long-term target strength of the ADF are set out in Table 2.5.4. See Section 4 of this brief for further discussion of the impact of the Strategic Reform Program.

Table 2.5.4: Long-term target for the permanent ADF

	Navy	Army	Air Force	Total
Post-DRP Baseline	13,800	23,000	13,000	50,000
East Timor Boost 1999		3,000	555	3,555
White Paper Target	13,800	26,000	13,555	53,355
2002-03 PBS				
Tactical Assault Group		154		154
Incident Response Regiment		117		117
2003-04 PBS				
Special Operations Command	3	321	3	327
Defence Capability Review				
Retire 2 oldest FFG	-416			-416
Retire F-111 strike fleet			-486	-486
2005-06 PBS				
Crew for additional Armidale class	63			63
2006-07 PBS				
Reactivate Minehunters	30			30
Rationalisation of ADF C2	-71	-96	-65	-232
HNA		1,485		1,485
2006-07 PAES				
Enhanced Land Force – Stage 1	47	1,446	185	1,678
GAP Year initiative	250	500	275	1,025
2007-08 PBS				
C-17			86	86
F/A-18F Super Hornets			477	477
Civilianisation and other adjustments	-17	-311	25	-303
Enhanced Land Force – Stage 2		922		922
Pre-2009 White Paper Total	13,689	30,538	14,055	58,282
700 extra naval personnel	700			700
subtotal	14,389	?	?	58,982
Strategic Reform Program	?	?	?	-1,182
2009 Defence White Paper Target	?	?	?	57,800

How much do personnel cost?

Personnel expenses for Defence including DMO in 2009-10 will be around \$7.9 billion rising to \$10 billion in 2012-13. (Note: these figures include the cost of military personnel and Defence civilians from PBS Table 20 on page 35 and DMO civilians from Table 3.2.3 on page 175. In the past, the cost of DMO military personnel was recorded on Defence's accounts as a supplier expenses (and appears as an own-source revenue of Defence's accounts).

Separate military and civilian personnel expenses have appeared in the last seven annual reports and in the 2008-09 PBS. This allows us to calculate the recent and estimated per-capita cost of civilian and military personnel over time. The results of this calculation appear in Table 2.5.5 and 2.5.6. The per-capita expenses include salaries, allowances, superannuation, health, redundancies, housing and fringe benefits tax.

To ensure consistency we have adjusted the historical data for military personnel expenses in Table 2.5.5 to remove military compensation, which has been transferred to the Department of Veteran's Affairs, and removed one-off expenses incurred in 2004-05. This ensures a like-with-like comparison between the years as far as possible. Percentage growth rates are given in nominal terms and taking account of inflation via the Consumer Price Index (CPI).

Table 2.5.5: Per-capita permanent ADF personnel expenses

	Military Numbers	Expense \$ 000's	Per Capita	Nominal Growth	Real Growth
00-01	50,355	4,047,121	\$80,372		
01-02	50,932	4,273,863	\$83,913	4.41%	1.51%
02-03	52,080	4,458,208	\$85,603	2.01%	-1.09%
03-04	52,034	4,890,100	\$93,979	9.78%	7.38%
04-05	51,813	4,757,900	\$91,828	-2.29%	-4.69%
05-06	51,151	5,093,100	\$99,570	8.43%	5.23%
06-07	51,504	5,515,651	\$107,092	7.55%	4.65%
07-08	53,109	6,051,573	\$113,946	6.40%	3.00%
08-09*	54,748	6,764,100	\$123,550	8.43%	6.68%
09-10	55,771	7,283,873	\$130,603	5.71%	3.96%
10-11	56,464	7,451,916	\$131,976	1.05%	-0.45%
11-12	57,099	7,622,385	\$133,494	1.15%	-0.85%
12-13	57,520	7,976,420	\$138,672	4.79%	2.29%
Average 2001-02 to 2008-09				4.97%	2.52%
Average 2009-10 to 2012-13				3.17%	1.24%

Source: Defence Annual Reports and 2009-10 PBS, expenses adjusted to take account of Reserve component. *2008-09 PAES

The key result from the time series of military per capita costs in Table 2.5.5 is that historical real growth has been around 2.5% per cent. This accords with the sorts of growth usually anticipated in defence planning. Curiously, the rate of growth anticipated over the next four years is about half the historical figure. We can only hope that some sort of accrual adjustment accounts for such optimistic planning, else it looks like more money will be required in the years ahead to cover military personnel expenses.

Table 2.5.6: Per-capita Defence civilian personnel expenses

	Civilian Numbers	Expense \$ 000's	Per Capita	Nominal Growth	Real Growth
00-01	16,292	\$956,661	\$58,720		
01-02	16,819	\$1,086,116	\$64,577	9.97%	7.07%
02-03	18,385	\$1,235,752	\$67,215	4.09%	0.99%
03-04	18,303	\$1,363,205	\$74,480	10.81%	8.41%
04-05	17,753	\$1,293,100	\$72,838	-2.20%	-4.60%
05-06	13,577	\$1,084,382	\$79,869	9.65%	6.45%
06-07	14,516	\$1,212,393	\$83,521	4.57%	1.67%
07-08	15,087	\$1,271,223	\$84,259	0.88%	-2.52%
08-09*	14,815	\$1,363,200	\$92,015	9.20%	7.45%
09-10	14,828	\$1,379,100	\$93,006	1.08%	-0.67%
10-11	14,841	\$1,421,700	\$95,795	3.00%	1.50%
11-12	14,822	\$1,462,500	\$98,671	3.00%	1.00%
12-13	14,821	\$1,520,900	\$102,618	4.90%	2.41%
Average 2001-02 to 2008-09				5.87%	3.12%
Average 2009-10 to 2012-13				3.00%	1.06%

Source: Defence Annual Reports and 2009-10 PBS.

Note: excludes DMO past 2005-06. *2008-09 PAES

Historically, civilian personnel expenses have increased around 0.6% faster than military expenses. The explanation for this rapid rise is likely the ongoing 'level enrichment' that has seen the number of senior personnel grow disproportionately. The anticipated reduction in per-capita expense growth is even more pronounced for civilian personnel than it was for their military brethren. Once again, we hope that there is some explanation for this other than optimism.

DMO per-capita personnel expenses are calculated in Table 2.5.7. We can see no explanation for why DMO per-capita rates are so much smaller and falling. This must surely be an artefact of the accounting system or an error. For the period 2009-10 to 2012-13 the figures all come from the 2009-10 PBS. This makes the falling per-capita rate even harder to explain.

Table 2.5.7: Per-capita DMO civilian personnel expenses

	DMO Civilians	DMO Expenses	DMO Per Capita	Nominal Growth	Real Growth
05-06	4502	\$353,892	\$78,608		
06-07	4951	\$409,262	\$82,662	5.2%	2.3%
07-08	5304	\$458,992	\$86,537	4.7%	1.3%
08-09*	5657	\$457,613	\$80,893	-6.5%	-8.3%
09-10	5764	\$452,930	\$78,579	-2.9%	-4.6%
10-11	5858	\$462,715	\$78,989	0.5%	-1.0%
11-12	5951	\$466,426	\$78,378	-0.8%	-2.8%
12-13	6116	\$476,951	\$77,984	-0.5%	-3.0%
Average				0%	-2.3%

Source: 2009-10 PBS and DAR, *2008-09 PAES

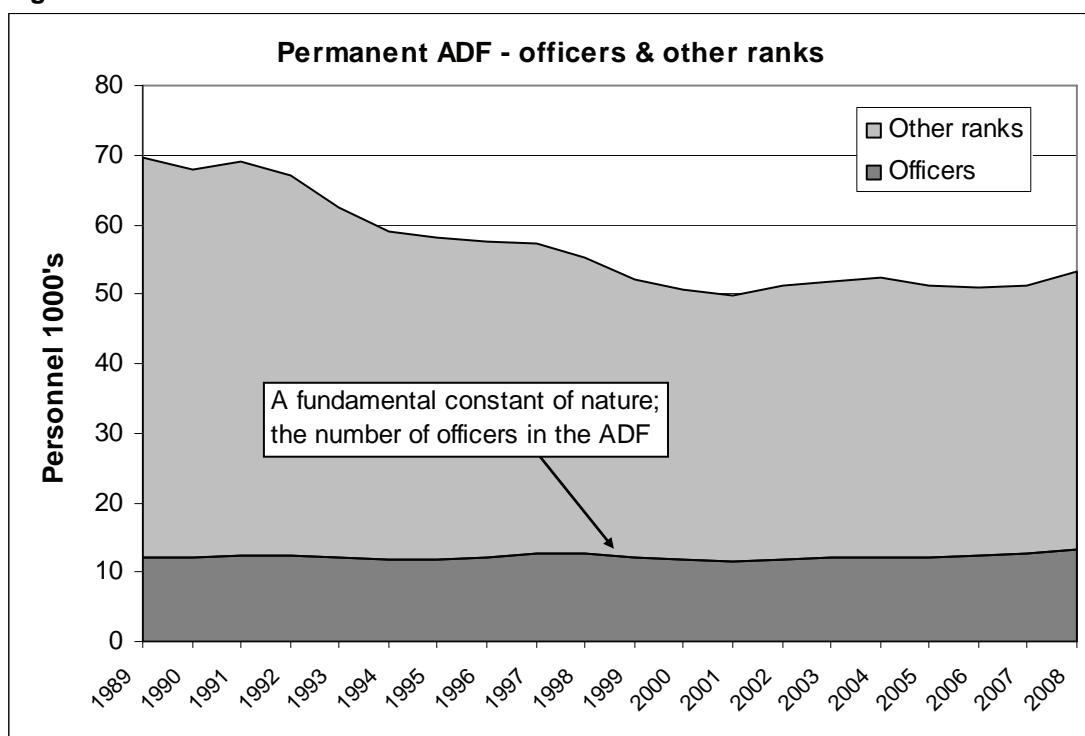
Finally, a caution is in order when looking at the data in the last three tables; the ongoing impact of accrual (non-cash) shifts can make very significant differences. This has probably contributed to some of the big year-on-year variations in growth in both civilian and military per-capita expenses. An additional complication this year

arises because of the 'White Paper Unassigned' category. We are unable to say where these additional personnel might be assigned and therefore cannot estimate their impact on per-capita growth rates. Accordingly, the trends are at best indicative and should be treated with care – but they are the best that we can extract from the budget papers.

Personnel Structures

The breakdown of ADF personnel by rank, and civilians by level, appears in Table 19 on page 34 of the PBS and in Table 62 on page 132 for DMO. As the ADF contracted during the 1990s, the number of officers remained more or less constant. Then, as the size of the ADF grew over the past few years, the number of officers grew more quickly. As a result, the percentage of officers in the ADF has grown from 17.2% in 1989 to 24.7% in 2008. There are now around three enlisted men for every one officer. In comparison, recent figures for the UK and US are around 19% and 16% respectively although it should be noted that they both have larger economies of scale. For the period covered by the last two annual reports, the number of officers rose by 520 at the same time as the number of enlisted personnel increased by 1,442.

Figure 2.5.6: Permanent ADF Numbers as at 30 June 1989 – 2007



Source: Defence Annual Reports 1989-90 to 2007-08

Generals and Mandarins

The trends in star rank, senior executive, and senior officer numbers are shown in Table 2.5.8, the most recent data is taken from the 2009-10 PBS. Changes in reporting account for the gaps and lack of earlier data.

As shown, in the past decade the number of civilian senior executives has increased by 60% and military star-rank officers by 57%. At the same time, the civilian workforce grew by only 20% and the military workforce by only 4%.

Table 2.5.8: Numbers of Senior Ranks and Executive Levels; average funded strength

	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	%
Civilian													
Executives (Defence)	100	106	103	117	130	123	96	102	108	121	121	123	
Executives (DMO)							30	29	29	32	34	37	
Total	100	106	103	117	130	123	126	131	137	153	155	160	60%
Senior Officers (Defence) ¹	0	0	3317	3844	3824	3889	3081	3385	3656	3911	3925	3995	20%
Senior Officers (DMO) ¹	0	0	0	0	0	0	995	1064	1225	1388	1483	1547	55%
Total	0	0	3317	3844	3824	3889	4076	4449	4881	5299	5408	5542	67%
Military													
Star Officers	110	0	120	119	120	119	125	135	149	176	170	173	57%
Senior Officers ²	1360	0	1415	1467	1507	1528	1551	1594	1684	1768	1809	1832	35%

Source: Defence Annual Reports and 2008-09 PBS. ¹ EL 1 and 2 Levels. ² Colonel and Lt Colonel Ranks. SES and senior officer figures include relief staff.

Over a similar time frame, the numbers of civilian and military senior officers (EL1 and EL2 civilians and Lt Colonel and Colonel equivalent ranks) have grown by 67% and 35% respectively. However, the fastest rate of increase has occurred at the level of Deputy Secretary and 3-star military officer (Table 2.5.9) where much of the growth is very recent, including as a result of the 2007 Defence Management Review.

Table 2.5.9 Numbers of Senior Ranks and Executive Level positions

	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	%
Deputy Sec. (Defence)	3	4	5	5	5	5	5	5	5	8	8	8	133%
Deputy Sec. (DMO)*	1	1	1	1	1	1	1	1	1	4	4	4	300%
subtotal	4	5	6	11	11	11	175%						
3-Star Officers	4	4	4	4	4	5	5	5	5	6	6	6	50%
Total	8	9	10	10	10	11	11	11	11	17	17	18	125%

Source: Defence Annual Reports and 2008-09 PBS.

*Includes CEO which was previous deputy secretary level

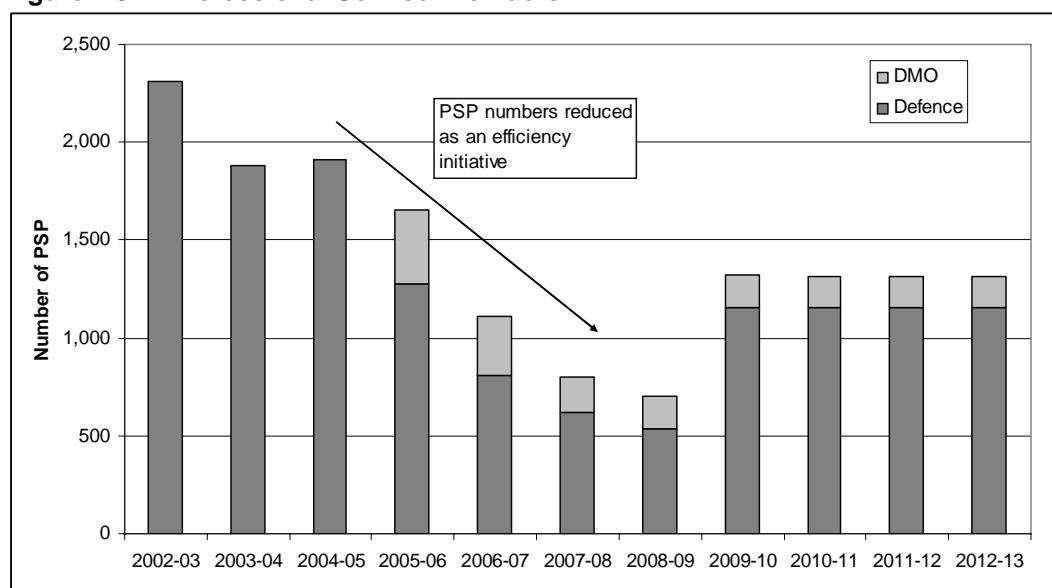
Whatever problems Defence might have, they are not a result of being under managed at the senior level. At every senior level in the civilian and military workforce the number of managers and executives has increased at a rate well in excess of the growth in the size of the overall workforce.

Professional Service Providers

The Defence workforce includes a limited number of specialist Professional Service Providers (PSP) in line positions within the organisation. For most of this decade, there has been a concerted effort underway to reduce the number of PSP employed by Defence and DMO. In fact, Defence has claimed successive reductions in the number of PSP represents as an internal efficiency. However, coincident with \$20 billion savings program, the number of PSP is set to more than double. See Figure 2.5.7.

However, we understand that this is simply a holding estimate pending analysis under the Strategic Reform Program to determine the most cost-effective mix of APS and PSP personnel.

Figure 2.5.7: Professional Service Providers



Source: Defence Annual Reports and 2009-10 PBS.

Defence Remuneration

The PBS does not deal with Defence remuneration. But because the largest single slice of the Defence budget goes towards civilian and military salaries we have included a short summary of the key data. Further detail can be found on the Defence Personnel Executive web-site: <http://www.defence.gov.au/dpe/>

Defence Salaries

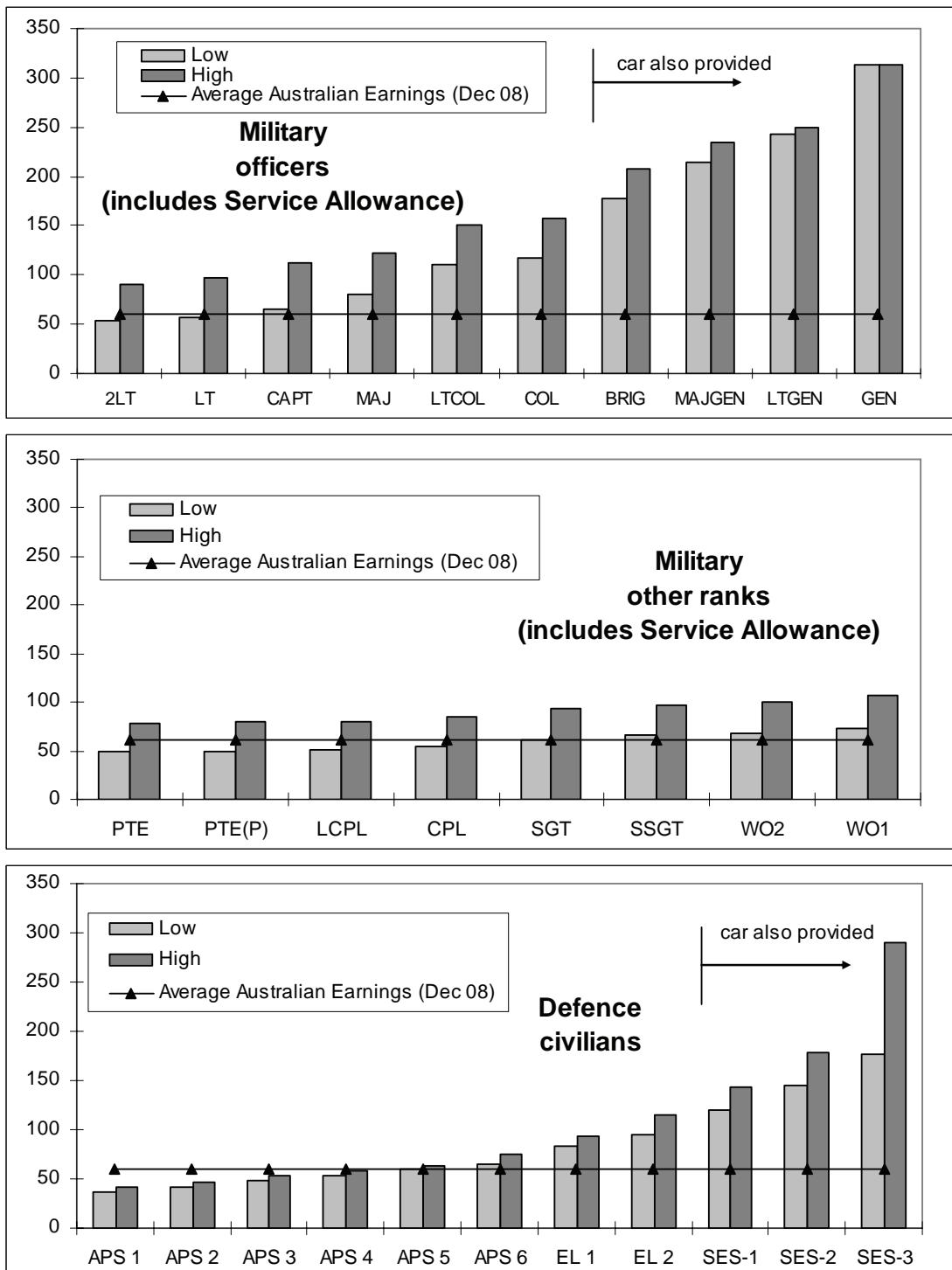
Figure 2.5.8 shows Defence military and civilian salaries circa late-2008/early-2009 benchmarked against the latest available Average Weekly Ordinary-Time Earnings for Full-Time Earning Adults (AWOFTEA) from December 2008. (Salaries for SES civilians and two/three-star military officers are for mid-2008.) The military figures include both salary and the service allowance of \$10,971 per annum received by all service personnel below the rank of Colonel. No account has been taken of the ancillary benefits received by military personnel like housing, medical, rations and specific allowances for skill, hardships and deployments. For comparison, all three graphs use the same scale.

To facilitate understanding of the salaries listed in the three graphs following, a comparison of relative ranks/levels has been provided in Table 2.5.10 below.

Table 2.5.10: Rank/level comparison:

Civilian	Navy	Army	Air Force
APS-4	Sub-Lieutenant	Lieutenant	Flying Officer
APS-5	Lieutenant	Captain	Flight Lieutenant
APS-6	Lt-Commander	Major	Squadron Leader
EL-1	Commander	Lt-Colonel	Wing Commander
EL-2	Captain	Colonel	Group Captain
SES-1	Commodore	Brigade	Air Commodore
SES-2	Rear Admiral	Major General	Air Vice Marshall
SES-3	Vice Admiral	Lt General	Air Marshall

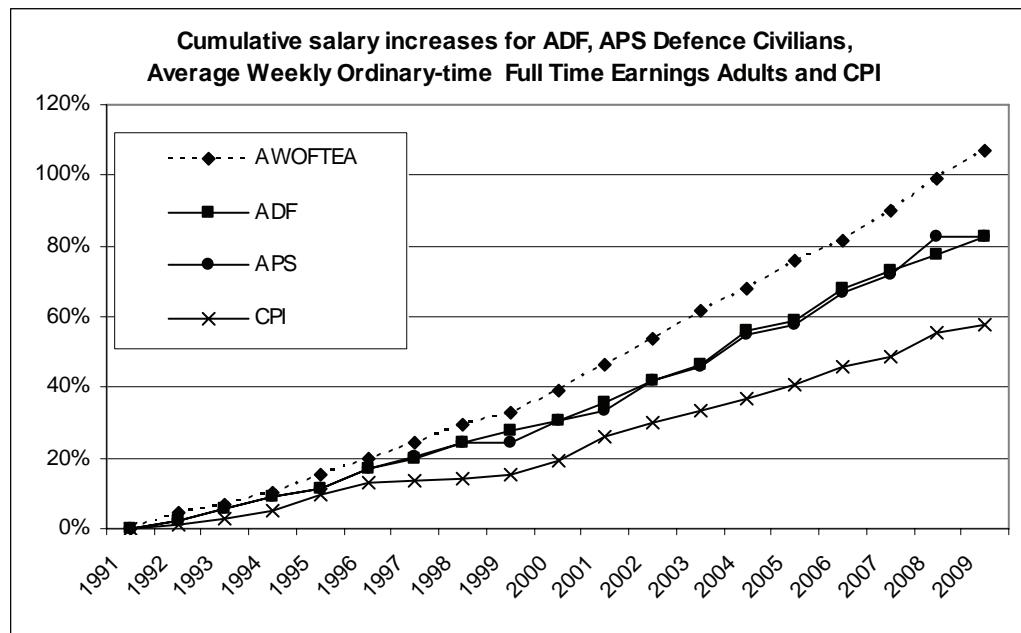
Figure 2.5.8 Defence salaries, late 2008 – early 2009



Source: ABS weekly earnings data; Defence pay rates from <http://www.defence.gov.au/dpe/pac/>
 Note: SES, LTGEN and GEN pay rate are from June 2008 (2007-08 DAR)

The comparison of defence salaries with AWFTE in Figure 2.5.8 represents only a snapshot in time. The relative dynamics of average earnings, defence salaries and the cost of living is quite another issue. Indeed, as Figure 2.5.9 shows, over the past decade and a half, defence salaries have consistently grown more slowly than average earnings but more quickly than the Consumer Price Index (CPI).

Figure 2.5.9: Defence civilian and military salaries – rate of increase



Source: ABS weekly earnings data and Defence pay rates available on <http://www.defence.gov.au/dpe/pac/>

Three observations can be made about the relative growth in average earnings, defence salaries and consumer prices:

- Because the salary increases for the (largely distinct) ADF and APS workforces are now explicitly linked, any suggestion that they are driven by productivity is tenuous to say the least.
- The fact that average earnings have outpaced defence salaries does not *necessarily* mean that defence remuneration has failed to keep pace with community standards. It may be that the growth in average earnings reflects structural changes in the Australian workforce. More analysis is needed prior to a firm conclusion.
- The actual remuneration of civilian personnel has increased much more quickly than for the military workforce, in part, through the ‘level enrichment’ shown in Table 2.5.8. (Note that civilian senior officers make up 27% of the civilian workforce while military senior officers only account for less than 3%, so that the former is much more sensitive to growth than the latter.)

Demographics of the ADF

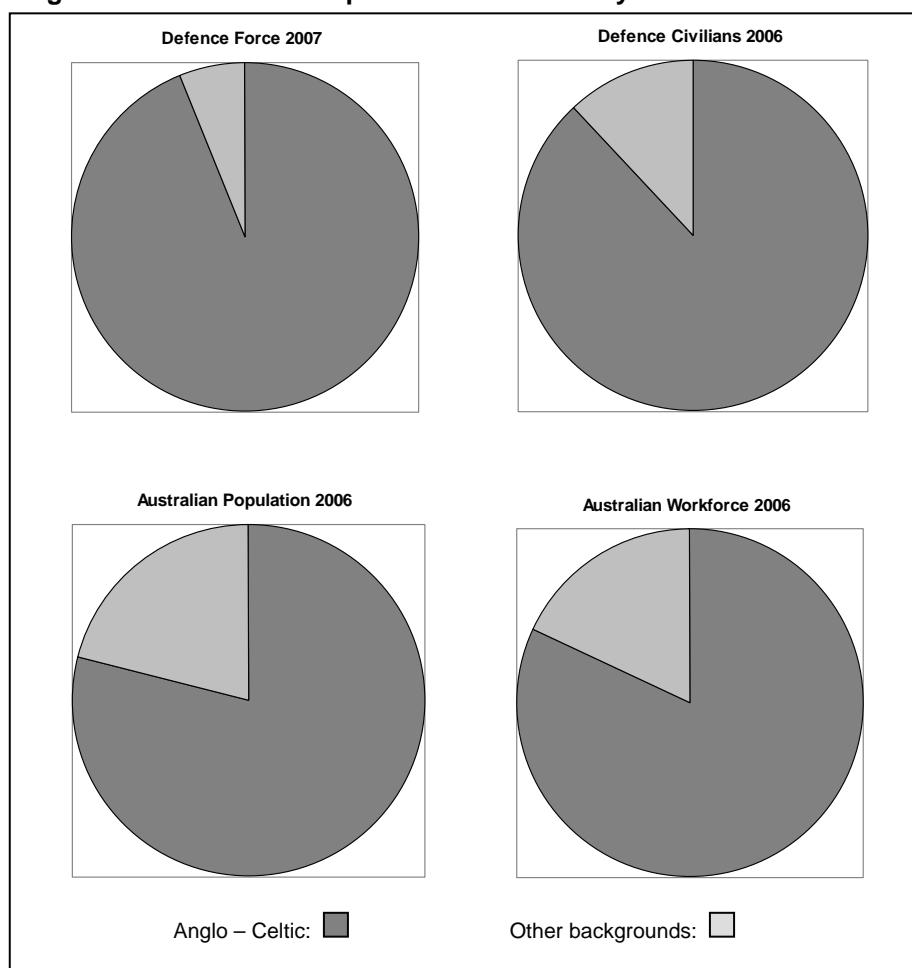
It is commonly accepted, including by the government, that the defence force is disproportionately drawn from the Anglo-Celtic part of the Australian population. The extent of over-representation is difficult to fully assess because the only available data concerns country of birth and not family background. Even so, as Table 2.5.11 shows, there are significant differences between the defence force and the community (similar results were found in the 1999 ADF census). The essential results are reproduced graphically in Figure 2.5.10. The figures are similar for the part-time Reserve force. Curiously, the over-representation of Anglo-Celtic born individuals extends to the civilian workforce of the Department of Defence.

Table 2.5.11: Ethnic composition of the Australian Defence Force

Place of Birth	Defence Force 2007	Australian Population 2006	Australian Workforce 2006	Defence Civilians 2007
Australia	87%	71%	73%	79%
UK and Ireland	5%	5%	6%	8%
New Zealand	2%	2%	3%	1%
Europe	1%	3%	3%	3%
Asia	1%	6%	7%	4%
Other	4%	12%	8%	5%

Sources: Defence military and civilian figures from the 2007 Defence Census; all other figures from Census 2006 conducted by the Australian Bureau of Statistics.

Figure 2.5.10: Ethnic composition of the ADF by birth



Sources: Defence military and civilian figures from the 2007 Defence Census; all other figures from Census 2006 conducted by the Australian Bureau of Statistics.

There are probably several reasons for the low rate of enlistment of those from other than Anglo-Celtic backgrounds. The customs and accoutrements of our defence force are as unashamedly British as they are alien to those of continental Europe, the Middle East or Asia. Equally, in geopolitical terms, we are part of the inner circle of US allies—the so-called Anglo-sphere—who all happen to speak English. As Australia steadily evolved into a more diverse and multi-ethnic society following the end of World War II, the cultural flavour of our military affairs remained largely static.

Whatever the reason, it is disappointing that our defence force is unable to attract recruits equally from across the Australian community. By relying on a limited part of the population, the defence force misses the opportunity to recruit some of the best and brightest in the community. Moreover, the language skills and cultural empathy of a largely Anglo-Celtic defence force are likely to be less than those of a more cosmopolitan force. Finally, there is something unsettling about a defence force that is unrepresentative of the society it exists to protect—especially for a country like Australia that defines its identity so closely with its military history and ethos.

Another area where the demographics of the Australian defence force and the society differ is gender. Table 2.5.12 shows the proportion of women and the share of jobs open to women, across the permanent uniformed and civilian workforces. Similar results hold for the part-time Reserve force.

Table 2.5.12: Women in the defence force

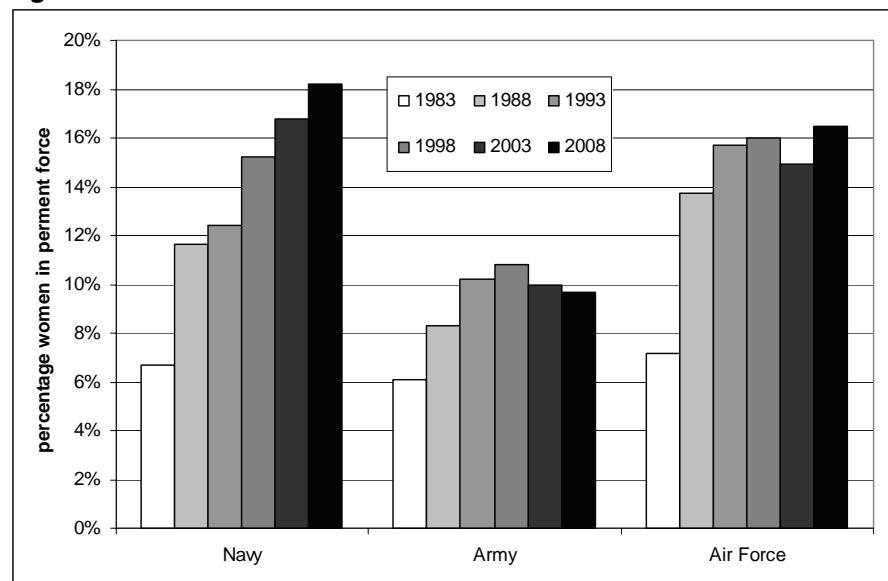
	Navy	Army	Air Force	Total military	Defence civilians
% of positions open to women	98.3%	51.0%	96.6%	72.6%	100%
% of women in uniform	18.2%	9.7%	16.5%	13.6%	37.5%

Source: 2001-02 and 2007-08 DAR

It is not that the defence force has ignored the issue. Over at least the past fifteen years a serious effort has been mounted to recruit and retain women in the force. A zero-tolerance policy towards sexual harassment is now in place across the entire force. Recruiting advertisements depict women as integral members of the defence force and highlight the opportunities available to them (and the same has more recently become true for persons from diverse ethnic backgrounds). The number of positions open to women has been expanded in all three services and an increasing number of women are reaching the higher ranks. More flexible arrangements are now in place to help female members manage the dual demands of career and family, and childcare facilities have been established in and around most military bases. Yet, the proportion of women in the force has remained essentially unchanged from a decade ago.

The contentious issue of opening more combat positions to women is a red-herring. Navy and Air Force open all but a tiny fraction of positions to women, yet the number of women choosing to serve is small. In the long run, women may not, for their own reasons, choose to serve in the defence force in larger numbers than today. This would not be surprising; the proportion of women in allied forces is similarly low—New Zealand 17%, United Kingdom 8.5% and United States 17%. That does not mean that the defence force should relax its effort to attract women to serve. The defence force needs the best people it can find and women represent the largest underutilised pool of potential recruits in the community.

Figure 2.5.11: Women in the defence force



Source: 1982-82 to 2007-08 DAR

2.6 Outcomes and Performance [PBS Section 2]

Under the framework explained in Section 1.3 of this Brief, the government funds Defence to achieve designated outcomes via a series of programs. These are described in Section 2 of the PBS.

The Cost of Outcomes and Programs

The core of the Defence Budget is the statement of the costs and performance of outcomes and outputs on p.37–94 of the PBS. The net cost of the outcomes and the programs they are made up of are displayed in Table 2.6.1. The net cost is derived by subtracting revenues from expenses. To capture the overall cost of delivering programs, non-cash expenses due to the depreciation of equipment are included in the net cost.

Note that the transition from ‘output Groups’ to ‘program’ was accompanied by the abandonment of ‘outputs’ that contained a more granular explanation of capabilities held by the three Services.

Table 2.6.1 Net outcome and program costs

Outcome 1: The protection and advancement of Australia's national interests through the provision of military capabilities and the promotion of security and stability	Net Cost 2008-09	Net Cost 2009-10
Program 1.1: Office of the Secretary and CDF	87,883	71,494
Program 1.2: Navy Capabilities	3,812,268	3,613,126
Program 1.3: Army Capabilities	4,795,768	4,729,836
Program 1.4: Air Force Capabilities	3,837,250	4,201,143
Program 1.5: Intelligence Capabilities	629,247	686,130
Program 1.6: Defence Support	3,244,835	3,191,481
Program 1.7: Defence Science and Technology	385,070	399,502
Program 1.8: Chief Information Officer	656,375	808,230
Program 1.9: Vice Chief of the Defence Forces	263,250	815,798
Program 1.10: Joint Operations Command	38,763	27,645
Program 1.11: Capability Development	179,240	514,271
Program 1.12: Chief Finance Officer	736,970	740,904
Program 1.13: People Strategies and Policy	370,112	348,480
Departmental outputs contributing to Outcome 1	19,037,031	20,148,040
Program 1.14 & 1.15 Defence Force Superannuation Benefits (Administered)	2,941,568	3,353,000
Program 1.16 Housing Assistance (Administered)		79,834
Program 1.17 King's Highway Upgrade (Administered)		-
Outcome 2: The advancement of Australia's strategic interests through the conduct of military operations and other tasks as directed by Government		
Program 2.1: Ops contributing to the security of the immediate neighbourhood	197,166	224,705
Program 2.2: Operations supporting wider interests	921,900	1,308,839
Outcome 3: Support for the Australian community and civilian authorities as requested by Government		
Program 3.1: Defence Contribution to National Support Tasks in Australia	12,863	10,619
Total net cost (non-administered)	20,156,097	21,681,584

Source: 2009-10 PBS and 2008-09 PAES

The outcome and programs for the Defence Materiel Organisation (DMO) are listed in the second part of the PBS [p. 161], for convenience these are listed in Table 2.6.2.

Table 2.6.2: Total outcome and program costs

Outcome 1: Contributing to the preparedness of the Australian Defence Organisation through acquisition and through-life support of military equipment and supplies	Cost 2008-09	Cost 2009-10
Program 1.1 — Management of Capability Acquisition	4,523,730	6,271,896
Program 1.2 — Capability Sustainment	5,117,317	5,474,108
Program 1.3 — Policy Advice and Management Services	103,015	104,695
Total DMO Outcome 1	9,744,062	11,850,699

Source: 2008-09 PAES, 2009-10 PBS

There is considerable overlap between the funds listed under the Defence outcomes/outputs and those for DMO. Around \$5.5 billion worth of Defence's program costs represent the purchase of sustainment services from DMO (Output 1.2). Put simply, around half of DMO's programs are inputs to Defence's programs. DMO's other \$6.3 billion program (Program 1.1) does not contribute to Defence's outputs. Instead, it represents the purchase of new capital equipment that will be used to deliver Defence's programs in the future.

As mentioned in Section 1, the new outcomes and programs are much more closely aligned with the actual organisation of Defence than were those employed from 1999-00 to 2007-08. Nonetheless, there are significant linkages between certain elements. We have tried to capture the situation in Figure 2.6.1. The essential points are as follows. The programs under Outcome 3 do not align with any single organisational entity. Instead they capture the net additional cost of operations that is apportioned to those groups that actually support and deliver the operations including DMO. At the same time, the DMO sustainment budget is reflected in the costs attributed to the various output groups, principally Navy, Army and Air Force.

Output Statements

For each of the programs, the PBS contains an entry detailing the key performance indicators and a cost summary. In many cases, the key performance indicators read like the entries in a corporate plan. For example, the Office of the Secretary and CDF has ten deliverables including;

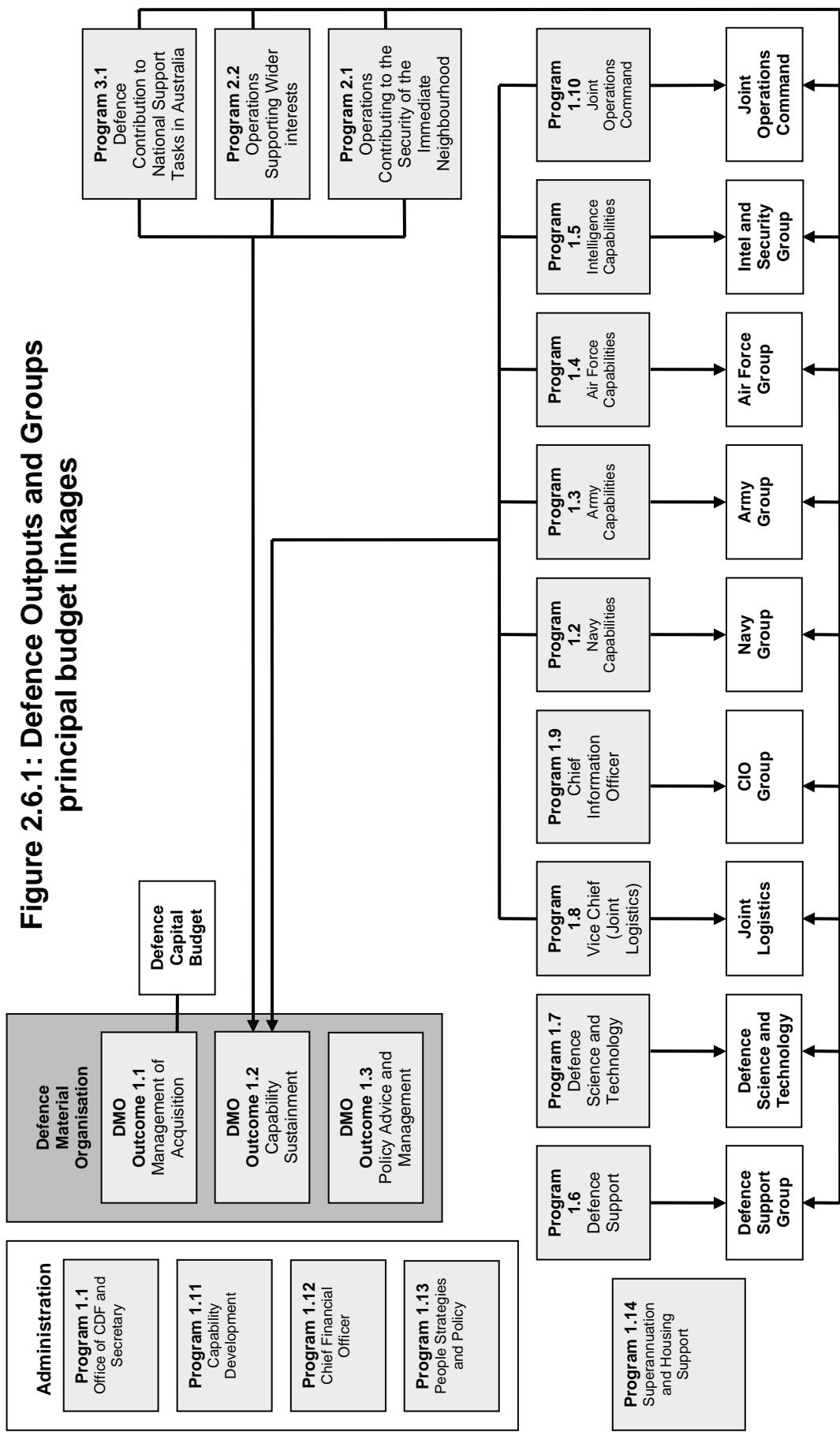
'...provide overarching strategic guidance, policy and supporting plans to inform Defence decision making including the development and use of Defence capability and the deployment of the ADF.'

and three performance indicators, including;

'...ensure that the Ministers are satisfied with the timeliness and quality of advice, including Cabinet documentation provided by the Department.'

Little would be gained by rehearsing the very large number of equally sensible key performance indicators that appear in the PBS. The interested reader can pursue them at leisure. Of more interest are the concrete performance measures set out for the military capability outputs.

**Figure 2.6.1: Defence Outputs and Groups
principal budget linkages**



Capability Performance

There are three broad performance measures employed at the output level in the capability related outputs; preparedness, core skills and quantity. These same performance measures have been employed in Defence Annual Reports and PBS in one way or another since 1999. We explore these three measures below. It's important to note that many of the output groups have additional specific performance measures.

Preparedness

Preparedness refers to the readiness and sustainability of the ADF to undertake operations, be it national support tasks, peacekeeping or war. The process by which preparedness targets are set bears recounting.

To begin with, the government's White Paper and Strategic Updates set out the broad strategic tasks that the ADF needs to be prepared to undertake – for example 'contributing to the security of our immediate neighbourhood'. Using this as a basis, Defence develops what is called *Australia's Military Strategy* which includes for each strategic task a series of *Military Response Options* which define the broad operational objectives without specifying how they are to be accomplished – for example 'maintain sea lines of communication to the north of Australia'. These Military Response Options then form the basis of the annual *Chief of the Defence Force's Preparedness Directive*.

The final result is a series of specific targets for each output. They are classified. But, for example, the light infantry output might be required to 'be prepared to deploy a battalion at 90 days notice to assist in a regional peacekeeping operation and to maintain the deployment for 12 months' (this example is purely illustrative).

Core Skills

Preparedness targets set for outputs are driven by Military Response Options with an anticipated warning time of less than 12 months. To take account of possible longer-term tasks and the requirement to retain broad expertise in the three Services, an enduring performance target for nearly all the Outputs is to 'achieve a level of training that maintains core skills and professional standards across all warfare areas'. The assessment of what is to be achieved, and whether it has been achieved, is ultimately based on the professional military judgement of the Service Chiefs.

Quantity

Most of the Outputs include one or more 'quantity' measures that try to capture some aspect of *how much* capability will be delivered. Each of the three Services uses a different type of measure.

Navy: The basic measure of quantity used by Navy relates in some sense to the availability of ships and their crew to undertake a mission. From 1990-91 to 1998-99 the measure used was the average number of vessels available over the year, from 1999-00 to 2000-01 it was the number of vessel days at Minimum Level of Capability (MLOC) and in 2001-02 it was the numbers of vessel days Fully Mission Capable (FMC). In 2005-06 yet another measure was introduced, the planned number of Unit Ready Days (URD), defined as follows: Unit Ready Days are the number of days that a force element is available for tasking, by the Maritime Commander, within planned readiness requirements. While this looks similar to the previous definition of Fully Mission Capable we're told that it is actually a different measure, and we therefore

caution against comparison between the two quantities. As of the 2003-04 DAR a new measure was introduced by Navy: 'Achieved Mission Capability' (AMC) which is the fraction of the URD for which a vessel meets the required level of readiness for the actual tasking for which the force element has been scheduled at any time through its operational cycle. Until an adequate baseline for AMC accumulates we will continue to focus on URD as the measure of quantity.

Army: With the exception of Army Aviation, the quantity measure used by Army is the presence of adequate quantities of trained personnel and equipment within an Output. No quantified targets are released publicly. In practice we get a qualitative assessment in the Annual Report.

Air Force: The quantity measure used by Air Force and Army Aviation is the number of flying hours undertaken by the Output. These measures have been applied consistently for over a decade and constitute a useful diagnostic tool given the established baseline.

Activity levels

Of all measures employed, flying hours are the only real measure of ADF activity that is disclosed (it would be useful if Navy's steaming-days and Army's track-miles were also disclosed). Table 2.6.3 details planned flying hours for key ADF platforms for 2008-09 and 2009-10. Given that the F-111 and Kiowa are being replaced by alternative platforms, the overall trend is for a measured increase in flying hours at the same time as several new platforms (Super Hornet aircraft and ARH and MRH helicopters) are brought into service. Figure 2.6.2 displays the longer-term trends in ADF flying hours.

Table 2.6.3: ADF flying hours 2008-09 and 2009-10

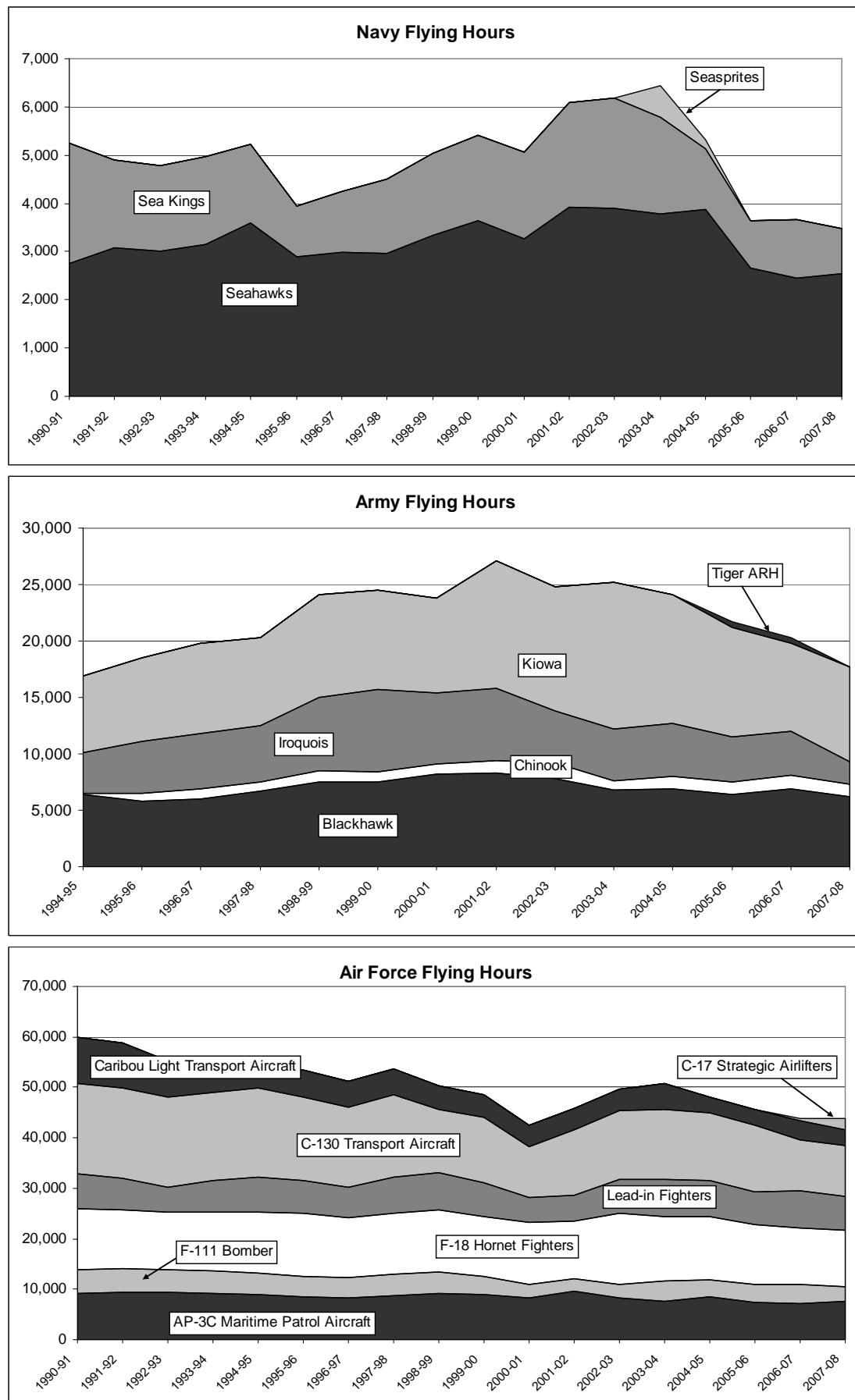
Platform	2008-09	2009-10	Change
F-111 bomber	3,250	2,700	-16.9%
F/A-18 fighter	11,500	12,000	4.3%
F/A-18 Super Hornet	0	900	-
C-130 transport	10,200	10,550	3.4%
AP-3C Orion	7,900	7,900	0.0%
C-17 transport	4,000	4,000	0.0%
Hawk Lead in fighter	7,600	8,000	5.3%
Chinook helicopter	1,570	1,570	0.0%
Blackhawk helicopter	7,500	8,600	14.7%
Kiowa helicopter	10,360	6,750	-34.8%
Armed recon helicopter	5,520	6,000	8.7%
MRH-90 helicopter	600	2,280	280%
Seahawk helicopter	3,100	3,400	9.7%
Sea King helicopter	1,100	1,100	0.0%

Source: 2008-09 and 2009-10 PBS

Recent Performance

The last six Defence Annual Reports have maintained a largely consistent format of reporting against performance targets at the output and sub-output level which equates to elements within the present programs. This makes year by year comparisons possible. Table 2.6.4 summarises the results from the 2007-08 Annual Report and tracks the changes from the year before. Defence uses a four-point performance scale for preparedness and core skills: Achieved, Substantially Achieved, Partially Achieved and Not Achieved. To facilitate presentation we have mapped the numerical 'quantity' results according to the key at the bottom of the table.

Figure 2.6.2: Long-term trends in ADF flying hours



Source: Defence Annual Reports

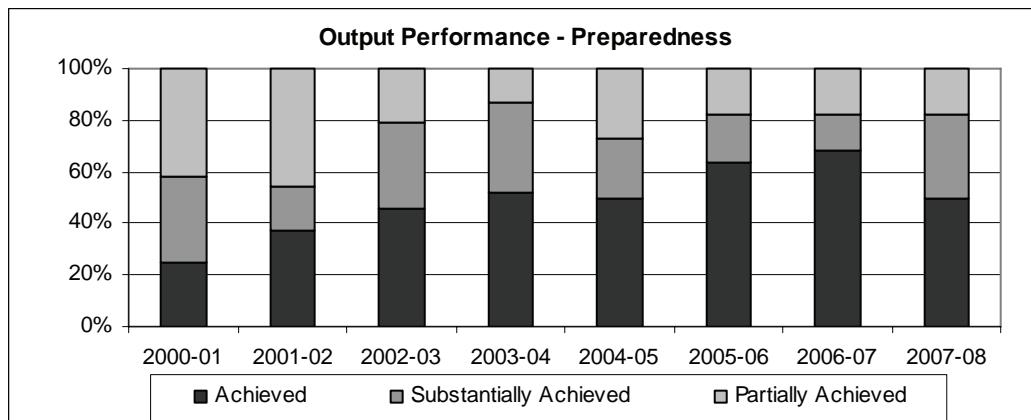
Table 2.6.4: Output Performance from the 2007-08 Defence Annual Report

Output	Preparedness	Core Skills	Quantity
1. DEFENCE OPERATIONS			
1.1 Command of Operations		Achieved ↔	
1.2 Military Operations		Achieved ↔	
1.3 National Support Tasks		Achieved ↔	
2. NAVY			
2.1 Major Surface Combatants	Substantially ↓	Partially ↓	Substantially ↔
2.2 Naval Aviation	Partially ↔	Substantially ↔	Substantially ↑
2.3 Patrol Boats	Achieved ↑	Achieved ↔	Achieved ↔
2.4 Submarines	Substantially ↔	Substantially ↔	Substantially ↑
2.5 Afloat Support	Achieved ↔	Achieved ↔	Substantially ↓
2.6 Mine Warfare	Achieved ↔	Achieved ↔	Substantially ↔
2.7 Amphibious Lift	Achieved ↔	Achieved ↔	Substantially ↓
2.8 Hydrographic	Achieved ↔	Achieved ↔	Substantially ↓
3. ARMY			
3.1 Special Ops	Substantially ↓	Achieved ↔	Substantially ↓
3.2 Medium Combined Arms	Substantially ↓	Partially ↔	Substantially ↔
3.3 Light Combined Arms Ops	Achieved ↔	Substantially ↔	Substantially ↓
3.4 Army Aviation Ops	Substantially ↓	Achieved ↔	Substantially ↔
3.5 Ground-Based Air Defence	Partially ↔	Partially ↔	Partially ↔
3.6 Combat Support Ops	Substantially ↔	Substantially ↔	Substantially ↔
3.7 Regional Surveillance	Achieved ↔	Achieved ↔	Achieved ↔
3.8 Operational Logistics Spt	Partially ↔	Partially ↔	Partially ↔
3.9 Motorised Ops	Partially ↔	Partially ↔	Substantially ↔
3.10 Protective Ops	Substantially ↓	Partially ↔	Partially ↔
4. AIR FORCE			
4.1 Air Combat Ops	Achieved ↔	Achieved ↔	Substantially ↔
4.2 Combat Spt of Air Ops	Achieved ↔	Substantially ↑	Achieved ↑
4.3 Strategic Surveillance & Res	Achieved ↔	Substantially ↓	Substantially ↔
4.4 Air Lift	Achieved ↔	Achieved ↔	Substantially ↓
5. STRATEGIC POLICY			
5.1 Strategic Engagement		Achieved ↔	
5.2 Military Strategy & Cmd		Achieved ↔	
6. INTELLIGENCE		Achieved ↔	
Improved since 2006-07: ↑	Static since 2006-07: ↔	Declined since 2006-07: ↓	
Quantity: Above 95% = Achieved, 95% to 75% = Substantially, Below 75% = Partially			

Source: 2006-07 and 2007-08 DAR

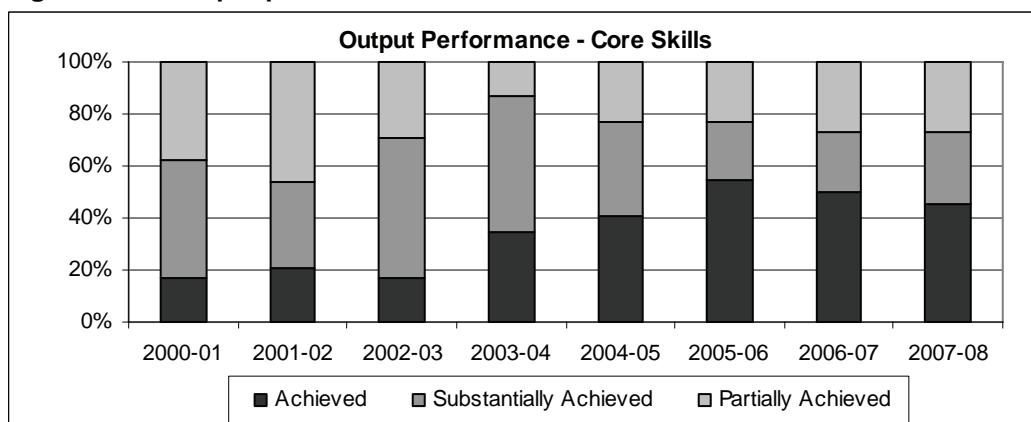
Figures 2.6.3 to 2.6.5 plot the delivery of Defence outputs as reported in the Defence annual reports between 2000-01 and 2007-08. There was a steady improvement over the first five or so years then a levelling off of performance followed by a decline over the past couple of years. We do not know why performance has been declining—perhaps it reflects rising standards.

Figure 2.6.3: Output performance – preparedness



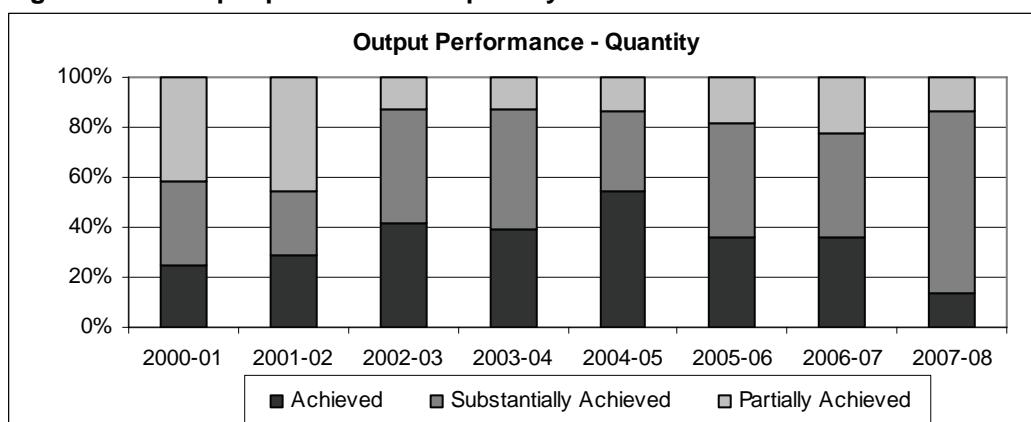
Source: 2000-01 to 2007-08 DAR

Figure 2.6.4: Output performance – core skills



Source: 2000-01 to 2007-08 DAR

Figure 2.6.5: Output performance – quantity



Source: 2000-01 to 2007-08 DAR

Output Summaries

To augment the information provided in the PBS, we have prepared short sub-program summaries containing background and performance information. In doing so, we have not sought to reproduce the material in the PBS but to compliment it. Only those programs where useful additional information is available have been included. An important part of the summaries is a graphical comparison of current targets with past performance. Unfortunately, it has not always been possible to include all the available data on flying hours and sea days within the summaries, so the data has been restricted to key platforms where necessary. Where an Output is congruent with one employed prior to the changed framework in 2009-10, historical performance information has been included.

Given the acute paucity of information provided in the PBS on what is to be delivered at the program level (or for that matter at any level) it is unclear whether it will be possible in the future to track the delivery of capability below the level of the three Services.

Program 1.2: Major Surface Combatants

Overview

Four 1980s **Adelaide class** (US Oliver Hazard Perry class) **Guided missile frigates (FFG)** plus eight newer German-designed and Australian-built **Anzac class frigates (FFH)**. Both vessels carry Harpoon anti-shipping missiles (Anzac currently being fitted), anti-submarine torpedoes and, eventually, Evolved Sea Sparrow surface-to-air missiles. Only the FFG are equipped with the more capable Standard surface-to-air missile (which are being upgraded to SM-2).

The Anzac class have a 5" gun useful for shore bombardment (as seen in the Gulf in 2003) while the FFG has a less capable 3" gun. Both classes of vessel can embark a Seahawk anti-submarine helicopter, although the current availability and capability of these aircraft is less than desired. The Anzac class was awaiting the entry into service of the Super Seasprite helicopter but that project has been cancelled.

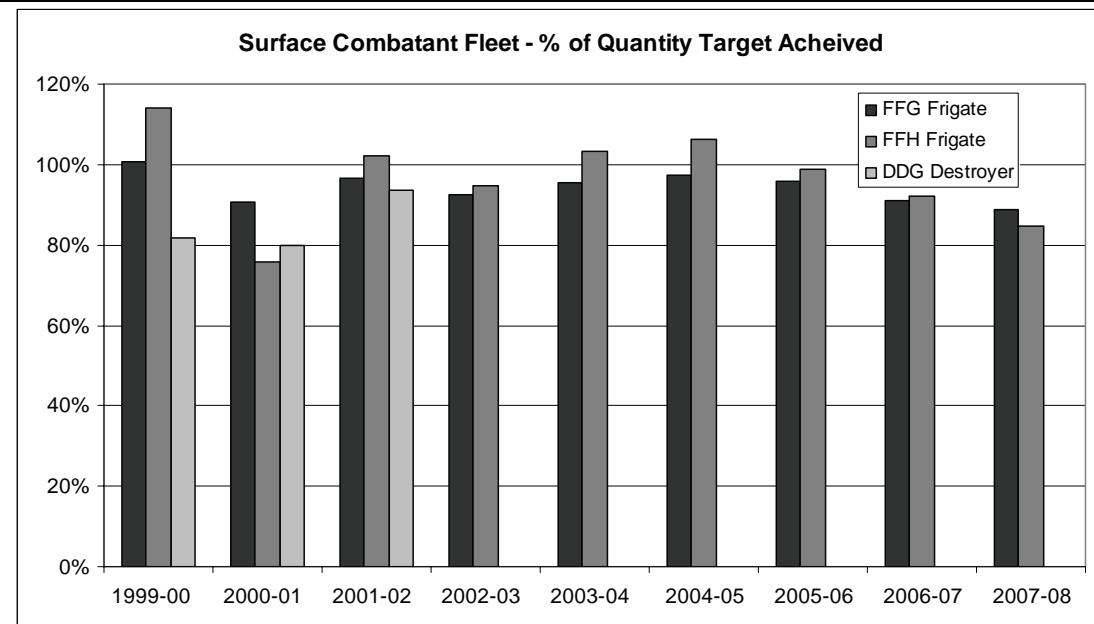
Upgrades are underway on both fleets. The FFG is nearing completion of the long-delayed \$1.4 billion FFG-upgrade project and the FFH are progressively being fitted with a range of new systems including an anti-shipping missile defence suite.

The FFH and FFG are fighting ships. They have the role of controlling sea-lanes, attacking hostile ships, submarines and aircraft, escorting shipping and protecting land forces.

Underperformance in preparedness and core skills during 2007-08 was due to personnel shortages.

Past Performance

	Preparedness	Core Skills	Quantity	
			FFG	FFH
2000-01	Achieved	Substantially Achieved	91%	76%
2001-02	Achieved	Substantially Achieved	97%	102%
2002-03	Achieved	Substantially Achieved	92%	95%
2003-04	Achieved	Substantially Achieved	96%	103%
2004-05	Achieved	Substantially Achieved	97%	106%
2005-06	Achieved	Substantially Achieved	96%	99%
2006-07	Achieved	Substantially Achieved	91%	92%
2007-08	Substantially Achieved	Partially Achieved	89%	85%



Note: Differing and incompatible quantity measures used over time have been converted to percentages.

Program 1.2: Naval Aviation

Overview

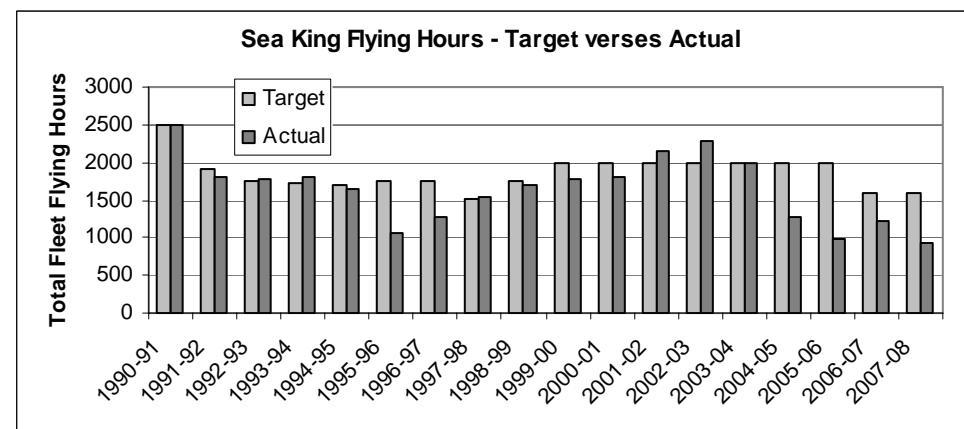
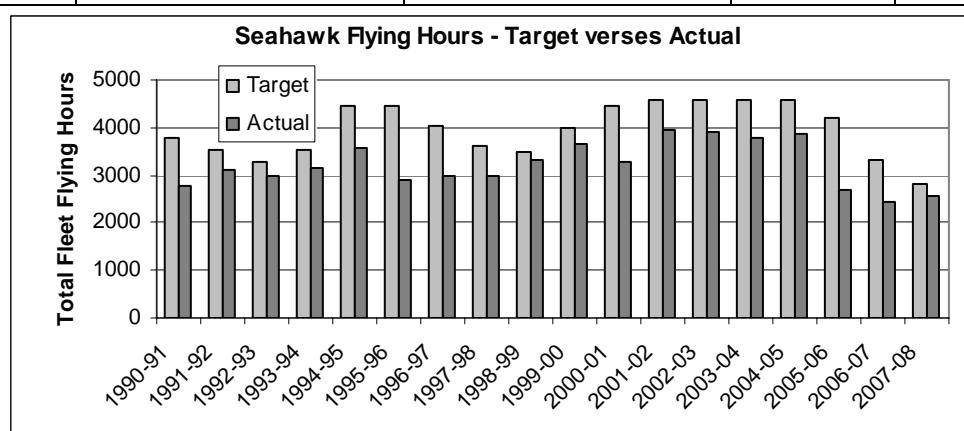
The RAN has sixteen 1980s US-designed **Seahawk helicopters** that can be embarked on the Anzac and FFG class frigates. They are configured for anti-submarine and surface search/targeting although the later role is increasingly less practiced. There are six 1970's UK-built **Sea King helicopters** used for troop lift and logistics tasks that will be replaced by six MRH-90 aircraft from 2010.

Thirteen **Squirrel light helicopters** are used for training and short-term operations at sea. In addition, ten Australian-designed **Kalkaras unmanned aerial targets** provide a training capability. A project to deliver eleven **Super-Seasprite helicopters** for the ANZAC frigates was cancelled in early 2008. Navy leases 3 Augusta Westland A190E aircraft for training and general duties.

In recent years, the performance of both the Sea King and Seahawk fleets has been compromised by personnel shortages, maintenance issues and ongoing aircraft upgrades and modifications.

Past Performance

	Preparedness	Core Skills	Achieved Quantity	
			Sea King	Seahawk
2000-01	Achieved	Achieved	90.2%	73.3%
2001-02	Achieved	Achieved	107.7%	85.5%
2002-03	Achieved	Partially Achieved	114.7%	84.5%
2003-04	Achieved	Substantially Achieved	99.6%	82.3%
2004-05	Partially	Substantially Achieved	63.4%	84.2%
2005-06	Partially	Substantially Achieved	49.0%	63.6%
2006-07	Partially	Substantially Achieved	76.8%	73.9%
2007-08	Partially	Substantially Achieved	57.9%	90.8%



Program 1.2: Patrol Boats

Overview

All of Navy's fleet of fifteen 1980s vintage Australian-built, UK-designed, **Fremantle Class Patrol Boats (FCPB)** have now been replaced by 14 new **Armidale Class Patrol Boat (ACPB)**. These vessels are mainly tasked in support of the civil surveillance program (see Output Group 3.1) through Border Protection Command. They can also be used for the insertion and extraction of army patrols on the coast including Special Forces.

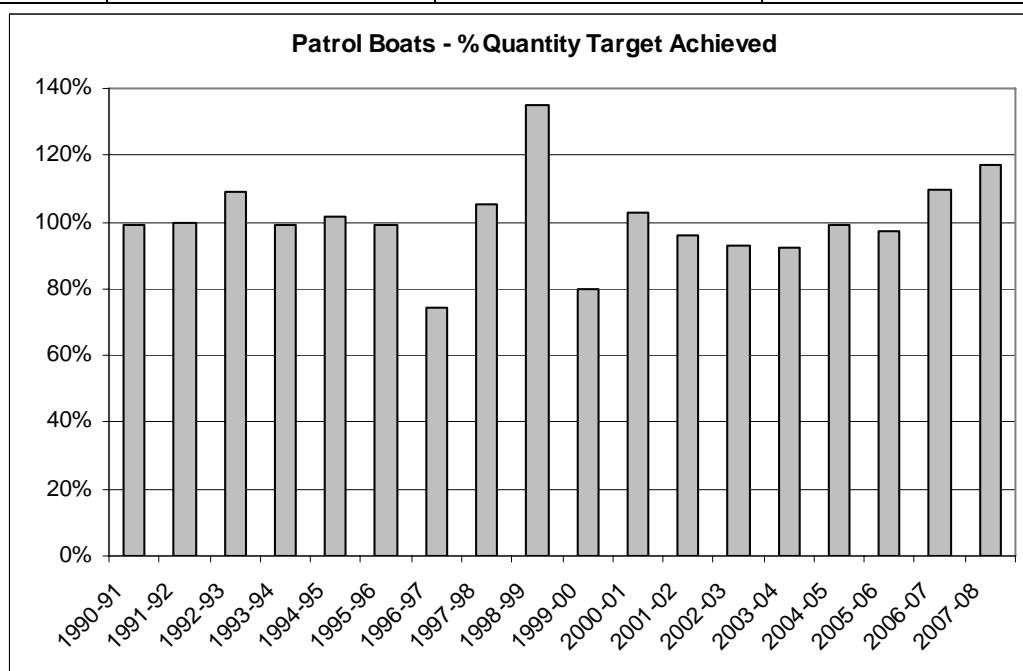
The patrol boat fleet also plays an important role in training junior officers by providing an opportunity for early independent command, and is an essential element of ADF engagement with Southwest Pacific nations.

Through an innovative program, the Navy multi-crews the Armidale Class vessels thereby reducing the burden on sailors and their families while maintaining a high utilisation of the assets. At present there are 21 crews spread across 14 vessels.

In 2007-08, problems with the vessel's fuel systems gave rise to unscheduled maintenance which has now been completed. Overachievement of Unit Ready Days in the same year (3,775 URD against a target of 3,227) arose because of faster than forecast delivery of the boats. The mature target for the fleet is 3,500 days of availability.

Past Performance

	Preparedness	Core Skills	Quantity
2000-01	Partially Achieved	Achieved	103%
2001-02	Achieved	Achieved	96%
2002-03	Achieved	Achieved	93%
2003-04	Achieved	Substantially Achieved	92%
2004-05	Achieved	Achieved	98%
2005-06	Substantially	Achieved	97%
2006-07	Substantially	Achieved	110%
2007-08	Achieved	Achieved	117%



Note: Differing and incompatible quantity measures used over time have been converted to percentages.

Program 1.2: Submarines

Overview

The RAN has six **Collins Class submarines**. Their primary roles are to attack enemy shipping and to counter the threat of adversary submarines. In addition, they can collect intelligence and insert and extract Special Forces. The Collins Class is equipped with Harpoon anti-ship missiles and the US Mk 84 heavyweight torpedo.

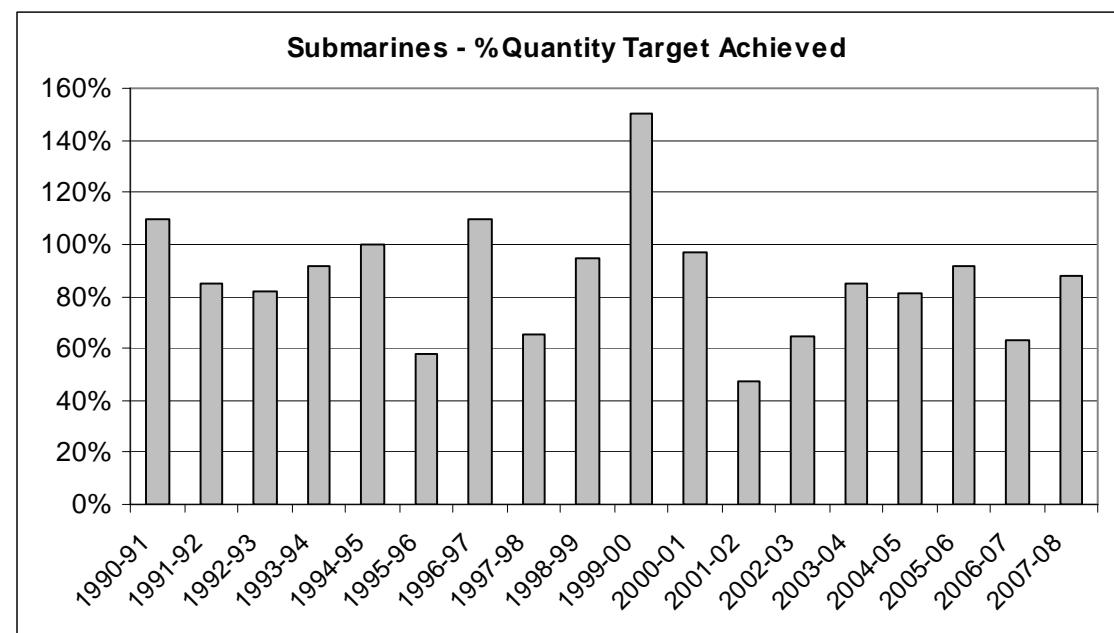
The delay in the introduction of the Collins Class into service as the Oberon Class payed-off disrupted both submariner training and the retention of skilled personnel. This is now being corrected through a remediation program. In the meantime, a shortage of submariners is severely reducing the delivery of capability. Personnel shortages are so acute that submarines have been tied up or put into maintenance early. Three submarines (half the fleet) were laid-up for maintenance for most of 2007-08.

Around a billion dollars of additional work is underway to bring the vessels up to the required operational standard. This includes a new combat system to replace the current interim arrangements and replacement Mk 48 ADCAP CBASS torpedoes. These are technically challenging projects which are not without risk. As of late 2008, all vessels had completed hull modifications and one boat had been fitted with the replacement combat system.

In recent years personnel shortages have compromised preparedness and the maintenance of core skills. Despite being only able to routinely crew three of the six submarines, Navy reported in 2007-08 that its preparedness targets had been substantially met. It would appear that they have a low expectation for the utilisation of these strategically critical and multi-billion dollar assets.

Past Performance

	Preparedness	Core Skills	Quantity
2000-01	Partially Achieved	Substantially Achieved	97%
2001-02	Partially Achieved	Substantially Achieved	47%
2002-03	Partially Achieved	Substantially Achieved	65%
2003-04	Substantially Achieved	Substantially Achieved	85%
2004-05	Substantially Achieved	Achieved	81%
2005-06	Substantially Achieved	Achieved	92%
2006-07	Substantially Achieved	Substantially Achieved	63%
2007-08	Substantially Achieved	Substantially Achieved	88%



Note: Differing and incompatible quantity measures used over time have been converted to percentages.

Program 1.2: Afloat Support

Overview

The afloat support force refuels and re-supplies Navy vessels and embarked helicopters at sea and provides logistics support to land operations. There are two vessels in the afloat support fleet:

HMAS Sirius: South Korean-built 46,017 tonne full displacement commercial vessel which was refitted to Navy specifications as an Auxiliary Tanker (AO).

HMAS Success: 1980s French-designed, Australian-built 17,900 tonnes full displacement Auxiliary Replenishment Tanker (AOR).

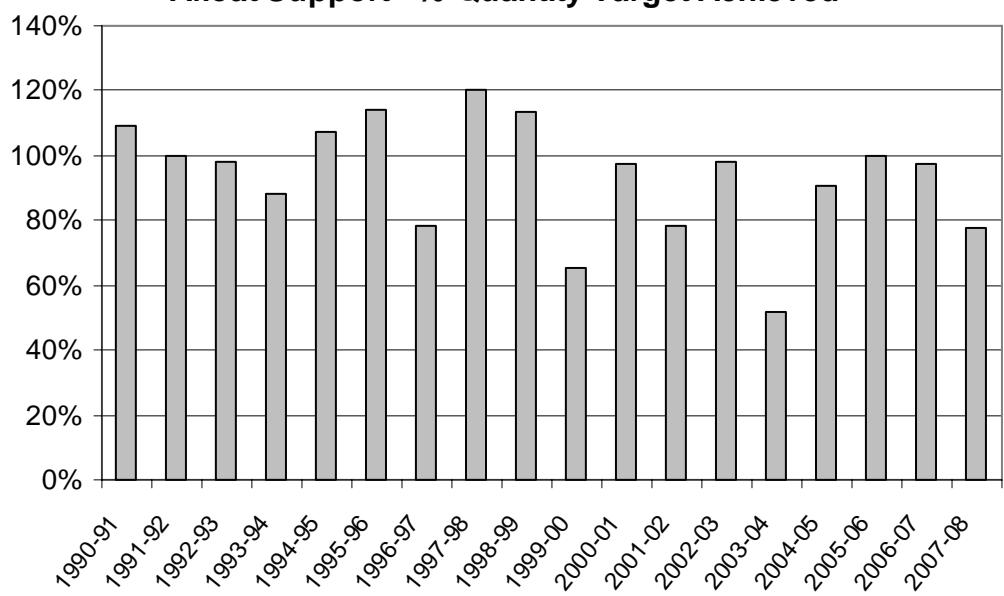
The less than planned number of URD for HMAS Success in 2007-08 was due to a delay in completing a scheduled refit, while the underachievement for HMAS Sirius arose due to engineering defects.

HMAS Sirius is scheduled to undergo a refit from April to late 2009.

Past Performance

	Preparedness	Core Skills	Quantity
2000-01	Substantially Achieved	Substantially Achieved	Replenishment Ship: 98% Oiler-Tanker Ship: 97%
2001-02	Achieved	Achieved	Replenishment Ship: 30% Oiler-Tanker Ship: 100%
2002-03	Substantially Achieved	Achieved	Replenishment Ship 109% Oiler-Tanker Ship 89%
2003-04	Substantially Achieved	Achieved	Replenishment Ship 105% Oiler-Tanker Ship 0%
2004-05	Achieved	Achieved	Replenishment Ship 85% Oiler-Tanker Ship 91%
2005-06	Achieved	Achieved	Replenishment Ship 100% Oiler-Tanker Ship 100%
2006-07	Achieved	Achieved	Replenishment Ship 101% Oiler-Tanker Ship 93%
2007-08	Achieved	Achieved	Replenishment Ship 55% Oiler-Tanker Ship 91%

Afloat Support - % Quantity Target Achieved



Note: Differing and incompatible quantity measures used over time have been converted to percentages.

Program 1.2: Mine Warfare

Overview

6 Huon Class Coastal Mine Hunters (MHC) – 720 tonnes displacement, plastic hulled, Italian-designed and built in Australia in the late 1990's. The ships employ sonar to search for mines which can then be destroyed using a remote controlled mine disposal vehicle or otherwise.

2 Auxiliary Mine Sweepers – 1980's converted tugs that physically sweep for mines.

2 Clearance Diving Teams – one on each coast at Sydney and Perth capable of clearing mines and other ordinance, clandestine survey and obstacle clearance, and submerged battle damage repairs.

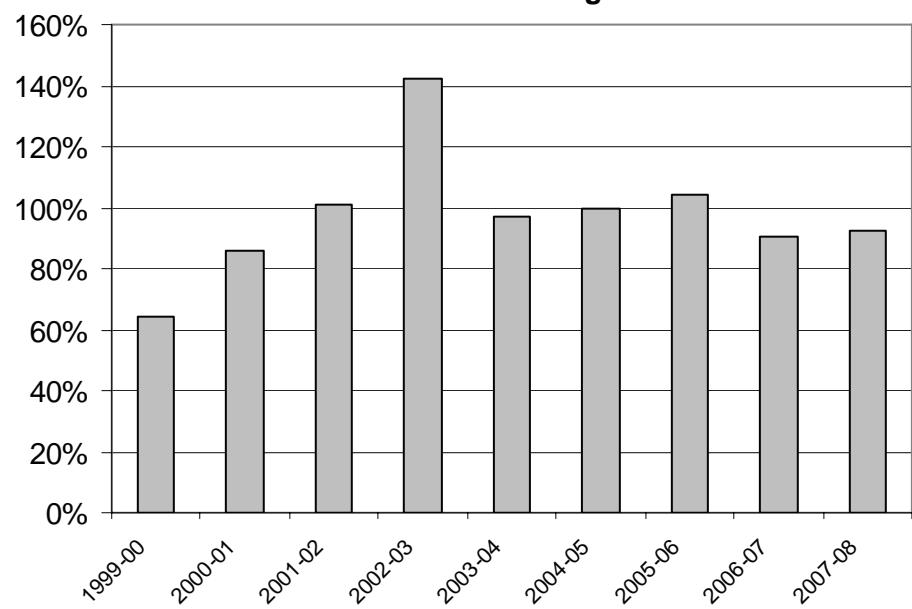
Due to financial constraints, two of the Coastal Mine Hunters were to be taken out of service and placed in 'extended readiness' in January and April 2006. This was countermanded in the 2006-07 budget and the two vessels were reactivated for border protection duties.

In 2007-08 the Huon Class mine hunters failed to achieve their planned URD because of various system-related defects. The auxiliary mine hunters only achieved 347 URD against a target of 732 in that same year because of an unscheduled refit extension for one of the vessels involving propulsion and systems-related equipment.

Past Performance (Mine Hunter Coastal)

	Preparedness	Core Skills	Quantity
2000-01	Partially Achieved	Substantially Achieved	86%
2001-02	Substantially Achieved	Achieved	101%
2002-03	Achieved	Achieved	142%
2003-04	Achieved	Substantially Achieved	97%
2004-05	Substantially Achieved	Achieved	99%
2005-06	Achieved	Achieved	104%
2006-07	Achieved	Achieved	91%
2007-08	Achieved	Achieved	93%

Mine Hunter Coastal - % of Target Achieved



Note: Differing and incompatible quantity measures used over time have been converted to percentages.

Program 1.2: Amphibious Lift

Overview

2 Kanimbla Class Landing Platforms Amphibious (LPA), HMAS Manoora and HMAS *Kanimbla*: refurbished in the mid-to-late 1990's from 2 second-hand 1970's US Newport Class Landing Ship Tank vessels. They displace 8,450 tonnes and can carry 450 troops along with vehicles and landing craft. In addition, they have been fitted with medical and command and control facilities, and have the ability to house up to four troop lift helicopters.

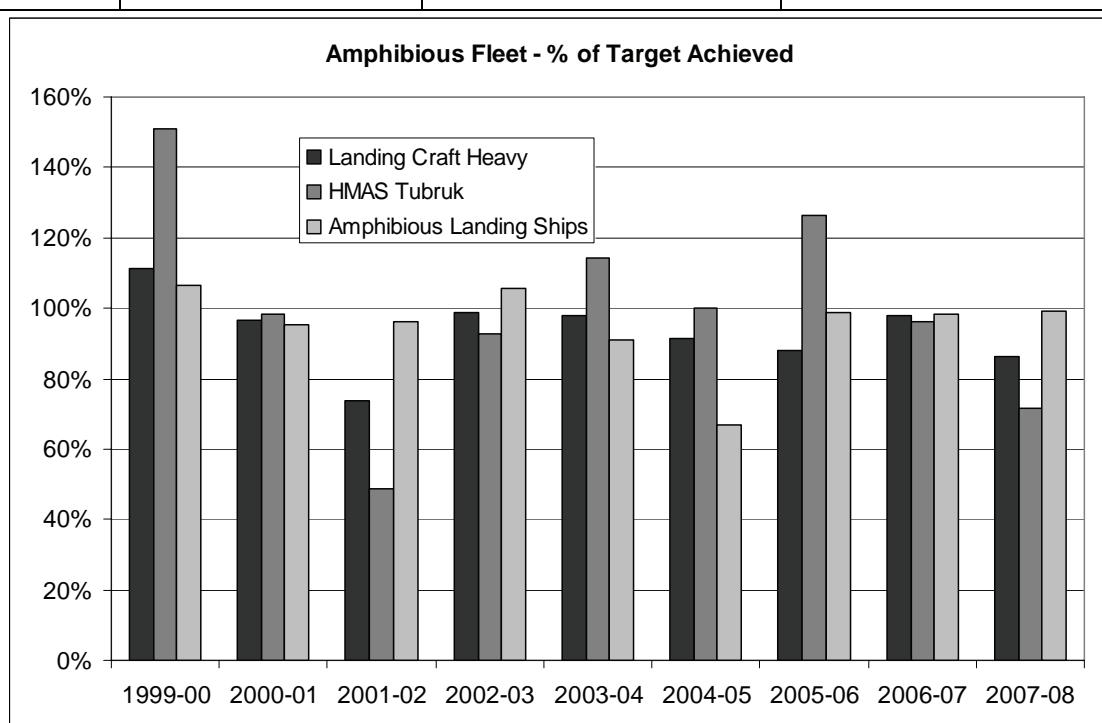
1 Heavy Landing Ship (HLS), HMAS *Tobruk*: a 1980's UK-designed and Australian-built vessel capable of carrying 315 soldiers, 18 tanks and 40 armoured personnel carriers. She displaces 5,800 tonnes and can operate any ADF helicopter from her deck.

6 Landing Craft Heavy (LCH): a fleet of 1970's craft that can carry a load of up to 180 tonnes a distance of over 1,200 nautical miles. Each vessel can carry three tanks, twenty-three quarter-tonne trucks or thirteen armoured personnel carriers. The LCH completed a life-of-type extension in 2003.

In 2007-08 the LCH fleet under-achieved its URD target due to engineering defects on HMAS *Tarakan* and a delay in achieving a mariner skills evaluation for HMAS *Labuan*. In 2008-09 the LPA fleet has a target of 642 URD, the HCH fleet a target of 1,958 URD, and the HLS has a target of 365 URD.

Past Performance

	Preparedness	Core Skills	Quantity
2000-01	Achieved	Achieved	97%
2001-02	Achieved	Partially Achieved	76.1%
2002-03	Achieved	Partially Achieved	100.1%
2003-04	Achieved	Substantially Achieved	98.3%
2004-05	Achieved	Substantially Achieved	87.2%
2005-06	Achieved	Achieved	93.1%
2006-07	Achieved	Achieved	97.7%
2007-08	Achieved	Achieved	87.2%



Note: Differing and incompatible quantity measures used over time have been converted to percentages.

Program 1.2: Hydrographic, Metrological & Oceanographic Ops

Overview

Hydrographic, meteorological and oceanographic operations for the production of maritime military geospatial information for the ADF. This output is also responsible for national hydrographic surveying and charting. The hydrographic component is supported by the Australian Hydrographic Office in Wollongong, NSW, and also comprises the Hydrographic Office deployable survey unit. Meteorological and Oceanographic support is conducted by mobile teams, the operational Meteorological and Oceanographic Centre in Sydney, NSW, and the Naval Air Station Weather and Oceanographic Centre in Nowra, NSW.

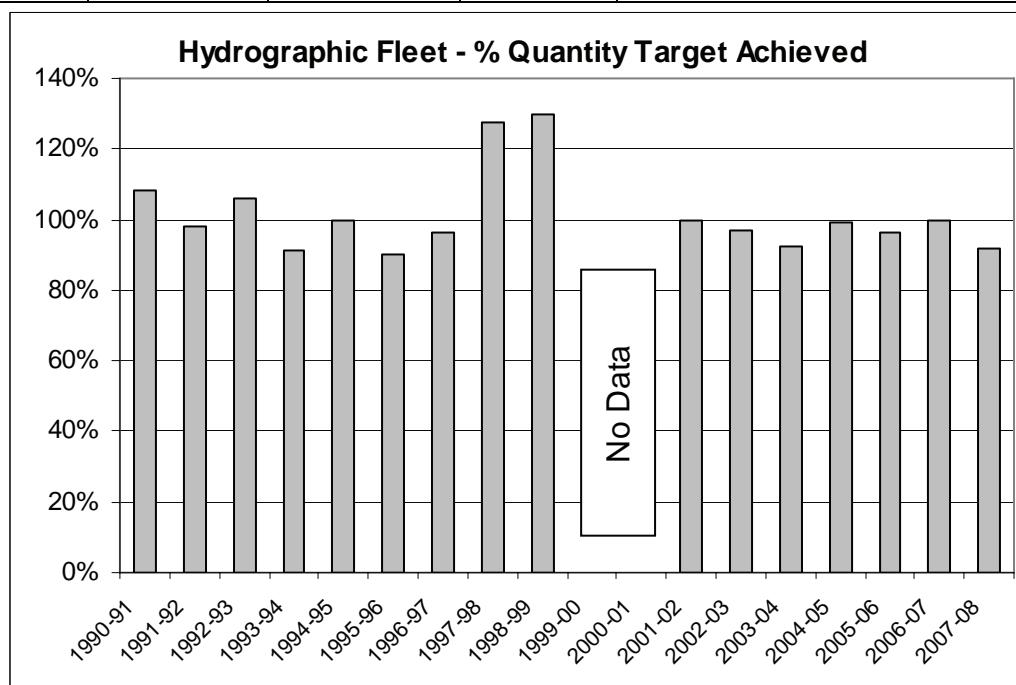
2 Leeuwin Class Hydrographic Ships (AGHS): 2,250 tonne Australian-built hydrographic ships.

4 Paluma Class Survey Motor Launches (SML): 320 tonne Australian-built survey launches.

1 Laser Airborne Depth Sounder (LADS) aircraft: an airborne depth sounder capability used in shallow water.

Past Performance

	Net Cost	Preparedness	Core Skills	Quantity	
2000-01	-	Partially Achieved	Not Applied	Partially Achieved (nil data on MLOC days)	
2001-02	-	Substantially Achieved	Partially Achieved	Hydrographic Ships: 105% SM Launches: 97%	627 FMC days 1012 FMC days
2002-03	\$165 million (estimate)	Substantially Achieved	Partially Achieved	Hydrographic Ships: 94% SM Launches: 99%	498 FMC days 913 FMC days
2003-04	\$225 million	Substantially Achieved	Achieved	Hydrographic Ships: 81% SM Launches: 98%	592 (URD) 1,432 (URD)
2004-05	\$255 million	Substantially Achieved	Achieved	Hydrographic Ships: 97% SM Launches: 100%	691 (URD) 1,324 (URD)
2005-06	\$230 million	Achieved	Achieved	Hydrographic Ships: 100% SM Launches: 94%	730 (URD) 1,105 (URD)
2006-07	\$258 million	Achieved	Achieved	Hydrographic Ships: 100% SM Launches: 94%	730 (URD) 1,105 (URD)
2007-08	\$300 million	Achieved	Achieved	Hydrographic Ships: 91% SM Launches: 92%	644 (URD) 1,091 (URD)



Program 1.3: Special Operations

Overview

One **Special Air Services Regiment (SASR)** in Western Australia. Roles include special recovery (including domestic and overseas counter terrorism by the west coast Tactical Assault Group - TAG), long-range reconnaissance and offensive operations.

One full time **Commando Battalion - 4 RAR (Cdo)** in Sydney including the east coast TAG.

One **reserve Commando Regiment 1 Cdo Regt** split between Sydney and Melbourne. Roles include land, sea- and air-borne offensive commando raids.

126 Signals Squadron in Sydney provides a reserve Special Forces signals capability and **152 Signals Squadron** in Perth provides a similar full time capability.

There is also an **Incident Response Regiment** based in Sydney that is capable of dealing with nuclear, chemical and biological incidents, plus a **Special Forces Logistics Squadron** in Sydney and a Special Forces Training Centre.

Equipment deficiencies compromised performance in preparedness and quantity in 2007-08.

Past Performance

	Preparedness	Core Skills	Quantity
2000-01	Achieved	Achieved	Achieved
2001-02	Partially Achieved	Partially Achieved	Achieved
2002-03	Achieved	Substantially Achieved	Achieved
2003-04	Achieved	Achieved	Achieved
2004-05	Achieved	Achieved	Achieved
2005-06	Achieved	Achieved	Achieved
2006-07	Achieved	Achieved	Achieved
2007-08	Substantially Achieved	Achieved	Substantially Achieved

Program 1.3: Medium Combined Arms

Overview

Based around the Darwin's **1st Brigade (1 Bde)** which includes:

1st Armoured Regiment equipped with reconditioned US-made M1A1 Abrams tanks.

2nd Cavalry Regiment (reconnaissance) equipped with 1990s North American-designed but Australian modified ASLAV light armoured vehicles.

5th and 7th Battalions Royal Australian Regiment - mechanised infantry battalions equipped with 1960s US-made M113 armoured personnel carriers (presently being upgraded) and Australian-made Bushmaster infantry mobility vehicles.

8th/12th Medium Regiment (artillery) equipped with US-made 155mm M198 Medium Howitzers and the British designed 105mm L119 Hamel light gun. In addition, 1st Brigade includes extensive organic logistics and engineer support including 1 Combat Engineer Regiment, 1 Combat Service Battalion, 1 Combat Service Support Battalion and 1 Communications Support Regiment.

High operational tempo coupled with personnel and equipment deficiencies caused preparedness, core skills and quantity targets to be missed in 2007-08.

Past Performance

	Preparedness	Core Skills	Quantity
2000-01	Partially Achieved	Partially Achieved	Partially Achieved
2001-02	Partially Achieved	Partially Achieved	Partially Achieved
2002-03	Partially Achieved	Partially Achieved	Substantially Achieved
2003-04	Partially Achieved	Partially Achieved	Substantially Achieved
2004-05	Partially Achieved	Partially Achieved	Substantially Achieved
2005-06	Partially Achieved	Partially Achieved	Substantially Achieved
2006-07	Achieved	Partially Achieved	Substantially Achieved
2007-08	Substantially Achieved	Partially Achieved	Substantially Achieved

Program 1.3: Light Combined Arms

Overview

Based around the Queensland-based **3rd Brigade** which includes:

Two light infantry battalions; **1st Battalion Royal Australian Regiment** (1 RAR) and **2 RAR** (Townsville),

One parachute infantry battalion, **3 RAR** (Sydney),

4th Field Regiment (artillery) equipped with the 105mm L119 Hamel light gun,

B Squadron 3rd/4th Cavalry Regiment with Bushmaster infantry mobility vehicles, and organic engineer and logistics support including 3 Combat Engineer Regiment, 3 Combat Service Battalion and 3 Communications Support Regiment.

The brigade includes a **Parachute Battalion Group** comprising 3 RAR along with airborne medical, artillery and other support elements. However, 3 RAR is being re-rolled as a light infantry battalion.

Past Performance

	Preparedness	Core Skills	Quantity
2000-01	Substantially Achieved	Achieved	Substantially Achieved
2001-02	Partially Achieved	Substantially Achieved	Achieved
2002-03	Achieved	Substantially Achieved	Achieved
2003-04	Achieved	Substantially Achieved	Achieved
2004-05	Achieved	Substantially Achieved	Achieved
2005-06	Achieved	Substantially Achieved	Achieved
2006-07	Achieved	Substantially Achieved	Achieved
2007-08	Achieved	Substantially Achieved	Substantially Achieved

Program 1.3: Ground Based Air Defence

Overview

16th Air Defence Regiment in South Australia, equipped with the **Swedish RBS 70** shoulder launched, optically guided, surface-to-air missile. This weapon was first developed in the 1970s and is classed as a short-range system. The towed surface-to-air **Rapier** RF-guided anti-aircraft missile system has now been retired from service.

The role of ground based air defence is to shoot down hostile enemy aircraft.

In 2007-08, the combination of operational commitments and equipment problems led to the failure to achieve targets in preparedness, core skills and quantity.

As of 2008-09 the Ground Based Air Defence ceased to be identified as a separate capability output.

Past Performance

	Preparedness	Core Skills	Quantity
2000-01	Partially Achieved	Substantially Achieved	Partially Achieved
2001-02	Partially Achieved	Substantially Achieved	Partially Achieved
2002-03	Substantially Achieved	Substantially Achieved	Partially Achieved
2003-04	Substantially Achieved	Substantially Achieved	Partially Achieved
2004-05	Partially Achieved	Substantially Achieved	Partially Achieved
2005-06	Partially Achieved	Substantially Achieved	Partially Achieved
2006-07	Partially Achieved	Partially Achieved	Partially Achieved
2007-08	Partially Achieved	Partially Achieved	Partially Achieved

Program 1.3: Army Aviation

Overview

Army aviation is based around **16 Bde** that commands the **1st and 5th Aviation Regiments**, which have components in Oakey and Townsville in Queensland, Darwin, Northern Territory, and Sydney, New South Wales.

The force structure includes:

- Thirty-four 1970s-designed **Black Hawk troop lift helicopters**.
- Forty-one 1970s-designed **Kiowa light observation & training helicopters**.
- Six 1960s-designed **Chinook medium lift helicopters**. All these helicopters are of US design.
- Twenty-two of an eventual fleet of twenty-four European-designed **Tiger Armed Reconnaissance Helicopters (ARH)** are now flying.
- Fifteen of an eventual forty MRH-90 troop lift helicopters.
- Three **Super King Air** fixed wing aircraft are used for surveillance and command & control support.

The now-retired Iroquois fleet and Blackhawk aircraft are being replaced by forty MRH-90 troop lift helicopters (from 2011). Although the aircraft have met their planned 'in-service-date' of 2007, an initial operational capability is not expected before 2009. These aircraft will be configured to operate from the Navy's LPA and future LHD vessels.

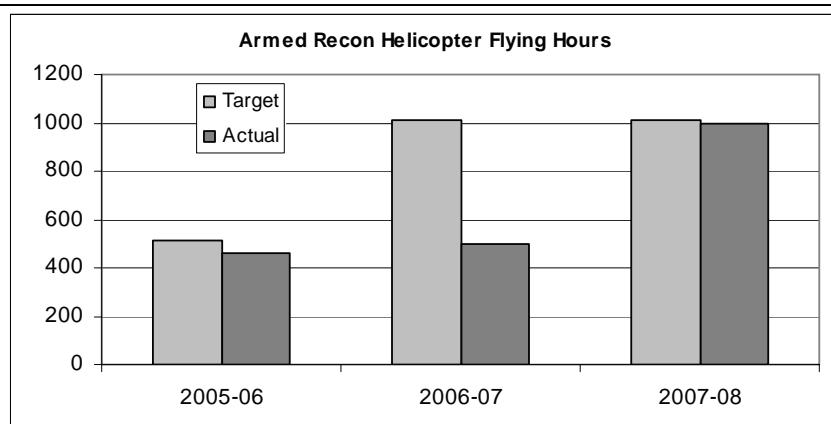
The twenty-five 1960s-designed **Iroquois troop-lift and fire support helicopters** have been withdrawn from service and the Kiowa fleet will be withdrawn from the reconnaissance role as the ARH enter service.

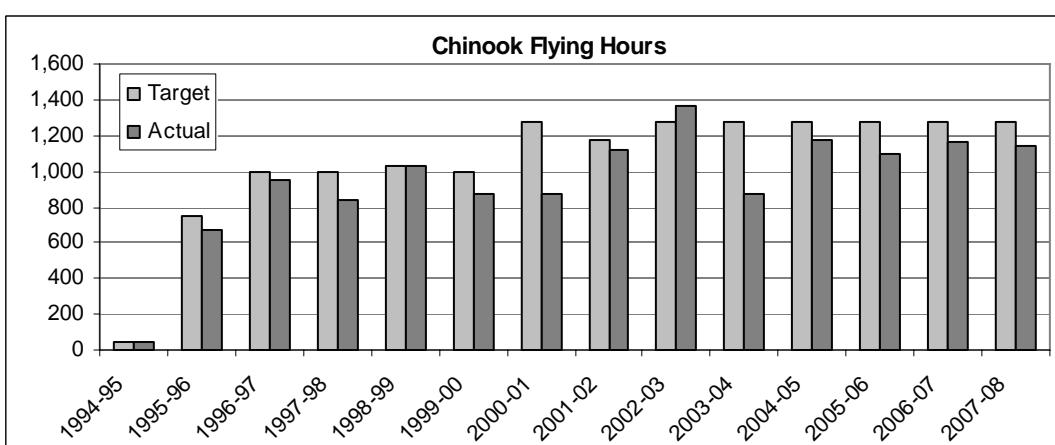
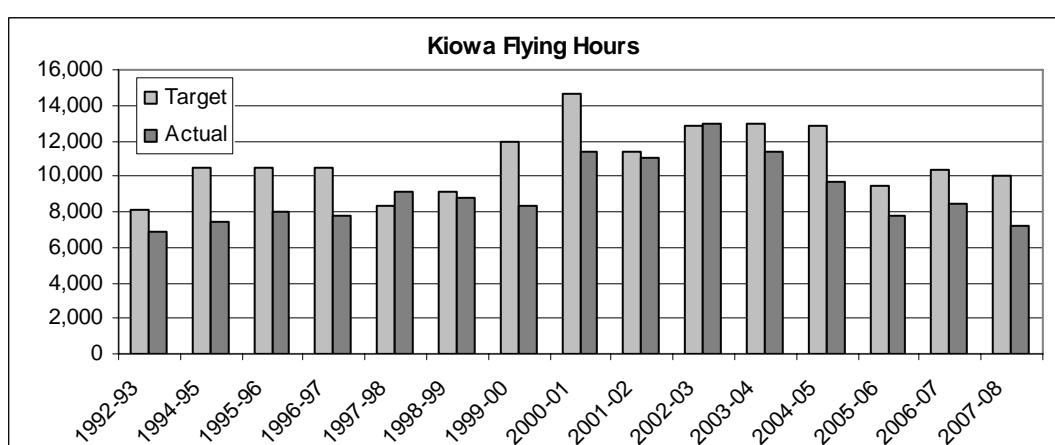
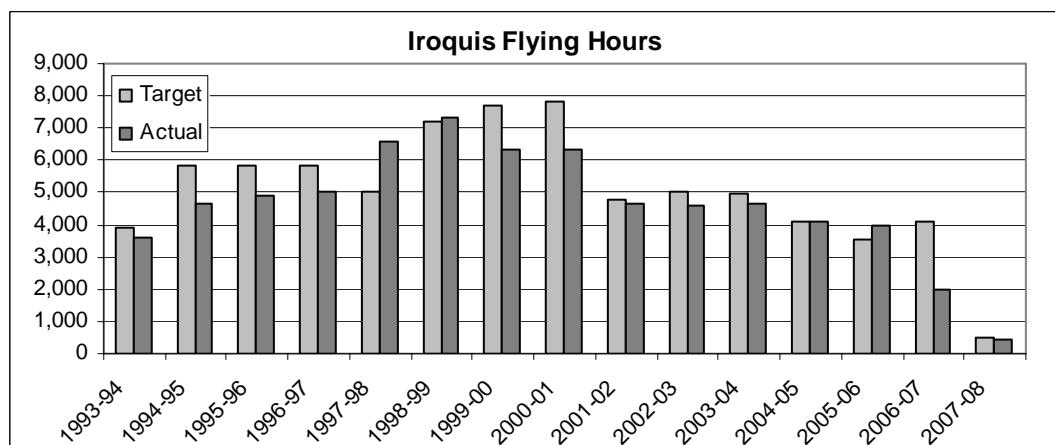
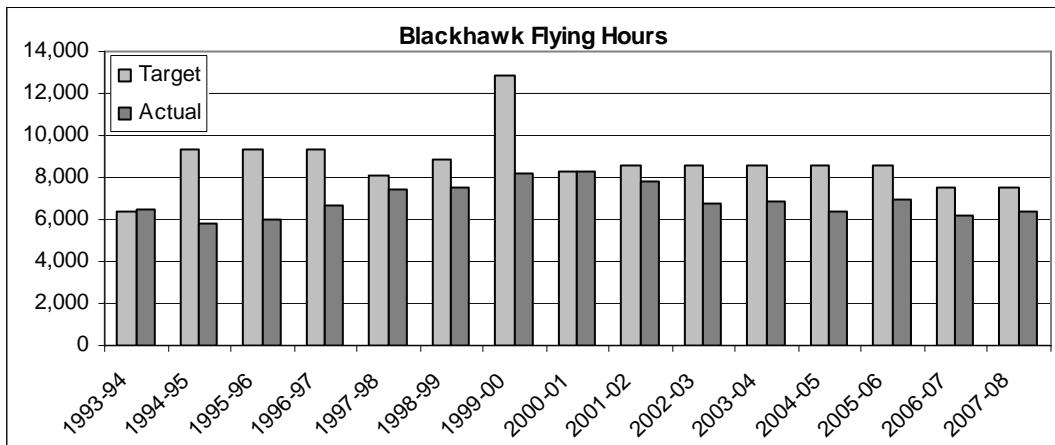
In 2007-08, high operational tempo and equipment deficiencies prevented the achievement of preparedness and quantity targets.

Past Performance

	Preparedness	Core Skills	Quantity*
2000-01	Substantially Achieved	Substantially Achieved	Substantially Achieved
2001-02	Achieved	Substantially Achieved	Substantially Achieved
2002-03	Achieved	Substantially Achieved	Substantially Achieved
2003-04	Achieved	Substantially Achieved	Substantially Achieved
2004-05	Achieved	Substantially Achieved	Substantially Achieved
2005-06	Achieved	Achieved	Substantially Achieved
2006-07	Achieved	Achieved	Substantially Achieved
2007-08	Substantially Achieved	Achieved	Substantially Achieved

*% of planned Black Hawk, Chinook, Iroquois & Kiowa flying hours.





Program 1.3: Combat Support

Overview

Combat Support Operations includes all non-logistic support to combat operations that is not embedded within Army's brigades. As such, it does not represent any single capability nor formation.

Accordingly, the sub-output includes a diverse collection of units including **HQ 6th Engineer Support Regiment, 21st Construction Regiment** (Sydney), **22nd Construction Regiment** (Melbourne), **17th Construction Squadron** (Sydney), **21st Construction Squadron** (Brisbane), **19th Chief Engineer Works** (Sydney), **1st Topographical Survey Squadron** (Enoggera, Qld), **Combat Training Centre** (Townsville), **20th Surveillance and Target Acquisition Regiment** (Brisbane), **7th Signals Regiment - Electronic Warfare** (Carbalah, Qld), **110th Signals Squadron** (Sydney), **1st Military Police Battalion** (Sydney), and **1st Intelligence Battalion** (Sydney).

In 2007-08, performance was compromised by equipment deficiencies, high operational tempo and personnel shortages in a range of skilled trades.

Past Performance

	Preparedness	Core Skills	Quantity
2000-01	Substantially Achieved	Substantially Achieved	Partially Achieved
2001-02	Substantially Achieved	Substantially Achieved	Partially Achieved
2002-03	Substantially Achieved	Substantially Achieved	Substantially Achieved
2003-04	Substantially Achieved	Substantially Achieved	Substantially Achieved
2004-05	Substantially Achieved	Substantially Achieved	Substantially Achieved
2005-06	Substantially Achieved	Substantially Achieved	Substantially Achieved
2006-07	Substantially Achieved	Substantially Achieved	Substantially Achieved
2007-08	Substantially Achieved	Substantially Achieved	Substantially Achieved

Program 1.3: Regional Surveillance

Force Structure & Role:

This was the smallest of all the Army outputs, being made up of three regional surveillance units that are predominately manned by reserve personnel. These are:

51st Battalion Far North Queensland Regiment (Cairns, Qld.) responsible for conducting reconnaissance and surveillance over 640,000 square km in Far North Queensland and the Gulf country; The West Australian based **Pilbara Regiment** (Karratha, WA) with 1.3 million square km to cover from the Kimberley boundary in the north, to Shark Bay in the south, then east to the NT/SA/WA border; and **North West Mobile Force (NORFORCE)** (Darwin) which covers the Northern Territory and the Kimberly region of northern Western Australia, an area of operations covering nearly one quarter of Australia's land mass – 1.8 million square kilometres.

The three regional surveillance units are also responsible for offshore islands and the Pilbara Regiment has specific responsibility for the oil and gas infrastructure on the northwest shelf.

Regional surveillance will henceforth not be reported as an output.

Past Performance

	Preparedness	Core Skills	Quantity
2000-01	Not Applied	Not Applied	Not Applied
2001-02	Achieved	Achieved	Achieved
2002-03	Achieved	Achieved	Achieved
2003-04	Achieved	Achieved	Achieved
2004-05	Achieved	Achieved	Achieved
2005-06	Achieved	Achieved	Achieved
2006-07	Achieved	Achieved	Achieved
2007-08	Achieved	Achieved	Achieved

Program 1.3: Operational Logistics Support to Land Force

Overview

The Logistics Support Force (LSF) is a brigade-sized grouping of reserve, integrated and permanent ADF units which can sustain a brigade on operations for extended periods while concurrently maintaining a battalion group elsewhere. It provides supply, fuel, communications, transport (surface vehicle and small watercraft), repair, and health and psychology capabilities. Elements include; **17th Combat Service Support Brigade HQ** (Sydney), the **2nd** (Glenorchy, Tas), **9th** (Sydney) & **10th** (Townsville) **Force Support Battalions**, **1st** (Sydney), **2nd** (Brisbane) & **3rd** (Adelaide) **Health Support Battalions**, **130th & 145th Signals Squadrons** (Sydney), **Deployed Forces Support Unit** (Sydney), **Force Support Group HQ** (Sydney), **1st Psychology Unit (Sydney)**, **1st Petroleum Company** (Oakley South, Vic), and **3rd Recovery Company** (Dandenong, Vic), **a logistics support force workshop** and **Ships Army Detachments** on HMAS **Tobruk** and the two LPA vessels.

Failure to achieve performance targets in 2007-08 was due to operational demands and personnel shortages.

Past Performance

	Preparedness	Core Skills	Quantity
2000-01	Substantially Achieved	Substantially Achieved	Substantially Achieved
2001-02	Substantially Achieved	Substantially Achieved	Partially Achieved
2002-03	Substantially Achieved	Substantially Achieved	Substantially Achieved
2003-04	Substantially Achieved	Substantially Achieved	Substantially Achieved
2004-05	Partially Achieved	Partially Achieved	Partially Achieved
2005-06	Partially Achieved	Partially Achieved	Partially Achieved
2006-07	Partially Achieved	Partially Achieved	Partially Achieved
2007-08	Partially Achieved	Partially Achieved	Partially Achieved

Program 1.3: Motorised Combined Arms Operations

Overview

Motorised Combined Arms Operations are based around the mostly medium readiness 7 Brigade (7 Bde). It is an integrated-regular formation including a HQ in Enoggera, Queensland, and including three motorised and light infantry battalions; **6th Battalion Royal Australian Regiment** (Brisbane), **9th Battalion Royal Queensland Regiment** (Brisbane), **25/49th Battalion Royal Queensland Regiment** (Brisbane and Darling Downs region), and the **2nd/14th Light Horse Regiment (Queensland Mounted Infantry) (Recon)** (Brisbane), **1st Field Regiment** (artillery) (Brisbane), **2nd Combat Engineer Regiment**, **7th Combat Support Regiment** and **7th Combat Services Support Battalion**.

This Output ceased to exist in 2008-09. We assume that it has been absorbed into either or both of Outputs 1.3.3 and 1.3.4.

Operational demands, personnel shortages in critical trades and equipment deficiencies including a shortage of Bushmaster vehicles prevented the achievement of performance targets in 2007-08.

Past Performance

	Preparedness	Core Skills	Quantity*
2000-01	Partially Achieved	Partially Achieved	Substantially Achieved
2001-02	Partially Achieved	Partially Achieved	Substantially Achieved
2002-03	Partially Achieved	Partially Achieved	Substantially Achieved
2003-04	Partially Achieved	Partially Achieved	Substantially Achieved
2004-05	Partially Achieved	Partially Achieved	Substantially Achieved
2005-06	Partially Achieved	Partially Achieved	Substantially Achieved
2006-07	Partially Achieved	Partially Achieved	Substantially Achieved
2007-08	Partially Achieved	Partially Achieved	Partially/Substantially

*Regular component

Program 1.3: Reserve Protective Operations

Force Structure & Role:

The **Reserve** protective operations output includes all those Reserve units not attributed to other sub-outputs. It is structured around six infantry brigades each of which has a HQ, two or three infantry battalions, an armoured reconnaissance unit and combat and logistics support units. These are:

4th Brigade in Melbourne,

5th & 8th Brigades in Sydney,

9th Brigade in Adelaide and Hobart,

11th Brigade in Townsville, and

13th Brigade in Perth.

In 2007-08, personnel shortages and support to operations prevented performance targets from being fully achieved.

Past Performance

	Preparedness	Core Skills	Quantity
2000-01	Achieved	Partially Achieved	Partially Achieved
2001-02	Achieved	Partially Achieved	Partially Achieved
2002-03	Partially Achieved	Partially Achieved	Partially Achieved
2003-04	Partially Achieved	Partially Achieved	Partially Achieved
2004-05	Partially Achieved	Partially Achieved	Partially Achieved
2005-06	Achieved	Partially Achieved	Partially Achieved
2006-07	Achieved	Partially Achieved	Partially Achieved
2007-08	Substantially Achieved	Partially Achieved	Partially Achieved

Program 1.4: Airlift Operations

Overview

Twelve **C-130J Hercules** & twelve x **C-130H Hercules**: Troop lift and transport aircraft also capable of being used in parachute operations and medical evacuation.

Four x Boeing **C-17 Globemaster III**: Responsive global airlift.

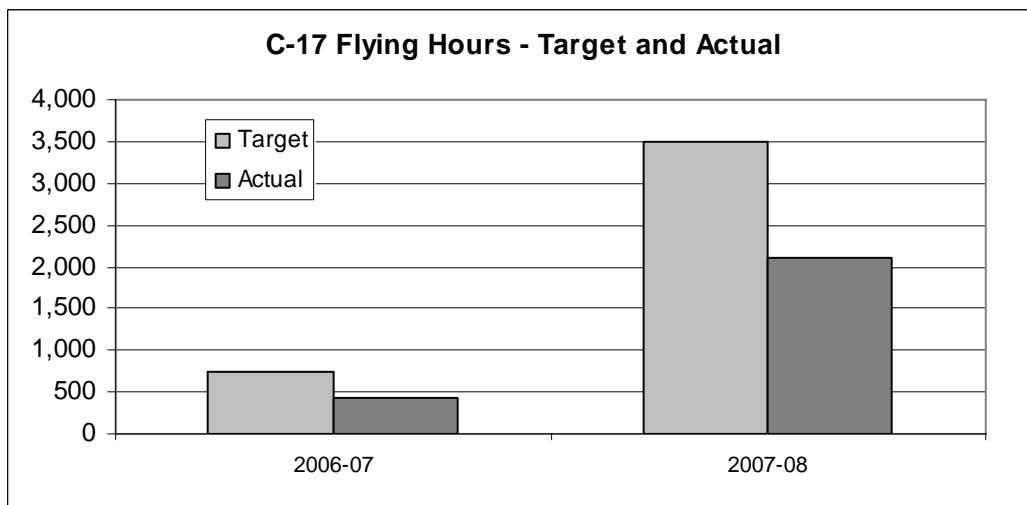
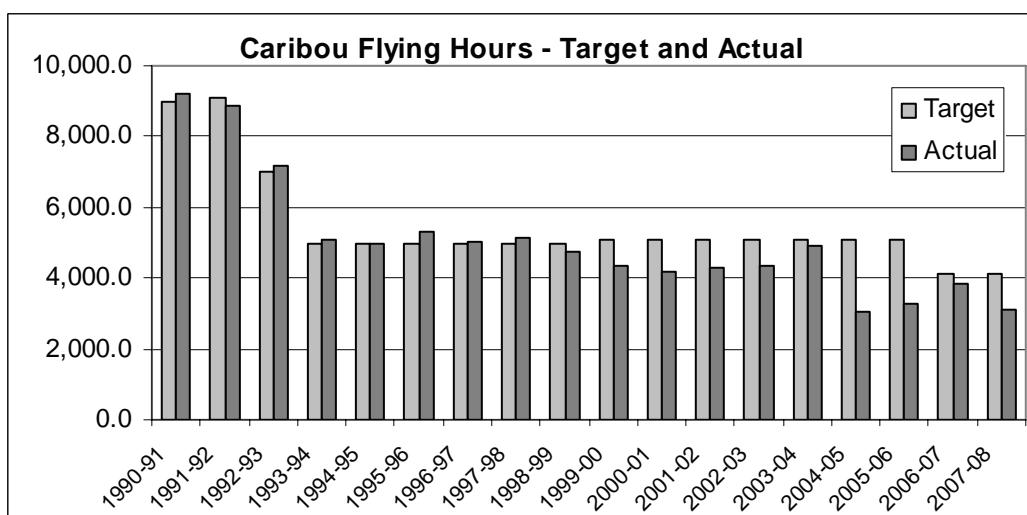
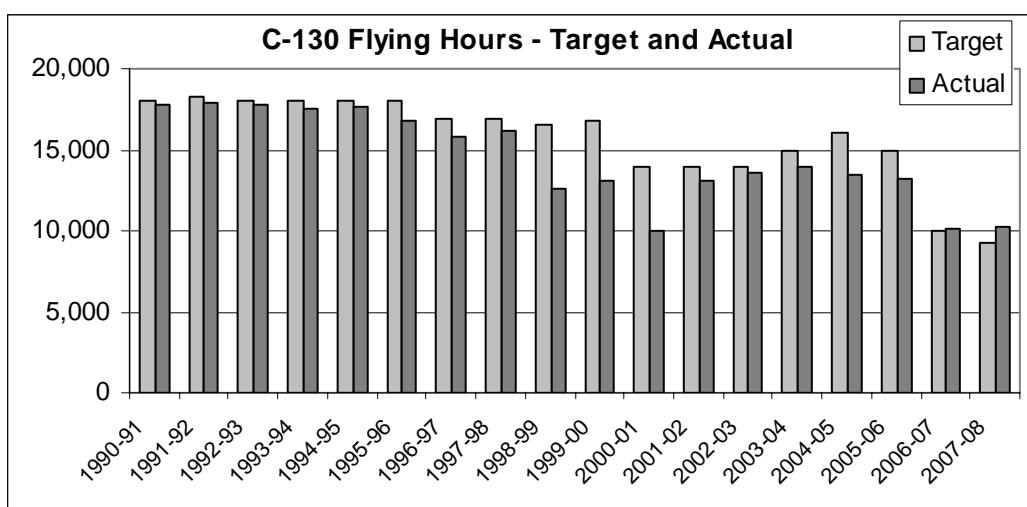
Fourteen x **DHC-4 Caribou**: Tactical transport aircraft able to operate from short runways.

Two x **Boeing 737 BBJ** and 3 x **CL604 Challenger**: VIP aircraft.

In 2007-08 the Caribou fleet failed to fly all of its planned hours due to a collocation of assets and ongoing equipment problems. The C-17 did similarly due to test and evaluation activities.

Past Performance

	Preparedness	Core Skills	Quantity	
			C-130H/J	Caribou
2000-01	Partially Achieved	Partially Achieved	78% (10,054 hrs)	82% (4,174 hrs)
2001-02	Partially Achieved	Partially Achieved	94% (13,102 hrs)	84% (4,289 hrs)
2002-03	Substantially	Substantially	97% (13,622 hrs)	85% (4332 hrs)
2003-04	Substantially	Substantially	93% (13,992 hrs)	97% (4,490 hrs)
2004-05	Substantially	Substantially	84% (13,502 hrs)	60% (3,038 hrs)
2005-06	Achieved	Achieved	88% (15,000 hrs)	65% (4,100 hrs)
2006-07	Achieved	Achieved	102% (10,182 hrs)	94% (3,838 hrs)
2007-08	Achieved	Achieved	111% (10,235 hrs)	76% (3,129 hrs)



Program 1.4: Combat Support of Air Operations

Overview

Details about this Output are difficult to find beyond that it comprises:

2 x Expeditionary Combat Support Wings,

1 x Health Services Wing.

Its role is to provide 'operations support activities required to support expeditionary air bases within Australia and overseas in contingencies, and maintain operating bases day-to-day in Australia'.

In 2007-08 operational commitments caused less than full achievement of the core-skills performance target.

Past Performance

	Preparedness	Core Skills	Quantity
2000-01	Partially Achieved	Partially Achieved	Partially Achieved
2001-02	Partially Achieved	Partially Achieved	Partially Achieved
2002-03	Achieved	Substantially Achieved	Partially Achieved
2003-04	Achieved	Achieved	Achieved
2004-05	Achieved	Partially Achieved	Achieved
2005-06	Achieved	Partially Achieved	Substantially Achieved
2006-07	Achieved	Partially Achieved	Substantially Achieved
2007-08	Achieved	Substantially Achieved	Achieved

Program 1.4: Capability for Air Combat Operations

Overview

15 F-111C Strike Aircraft: 1960s design US-made supersonic bombers (plus 12 F-111G in storage and 2 being used for spares). The F-111C fleet provides a long-range strike capability. The F-111 fleet has been in service since the early seventies and the RAAF is now the sole operator of the aircraft. Current planning is to retire the aircraft around 2010 when they will be replaced by a fleet of twenty-four 'interim' **F/A-18 F Super Hornets**.

71 F/A-18 Fighter Aircraft (55 F/A-18A and 16 F/A-18B): these 1980s vintage US designed and Australian assembled aircraft provide a capability for; air-defence, tactical air support, land strike, maritime strike, and air reconnaissance.

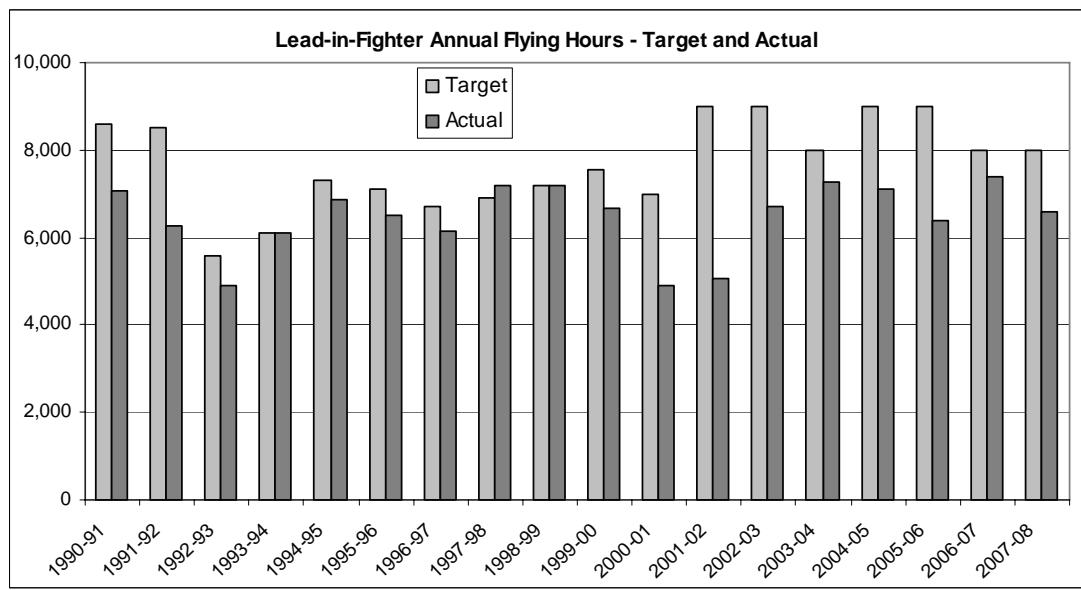
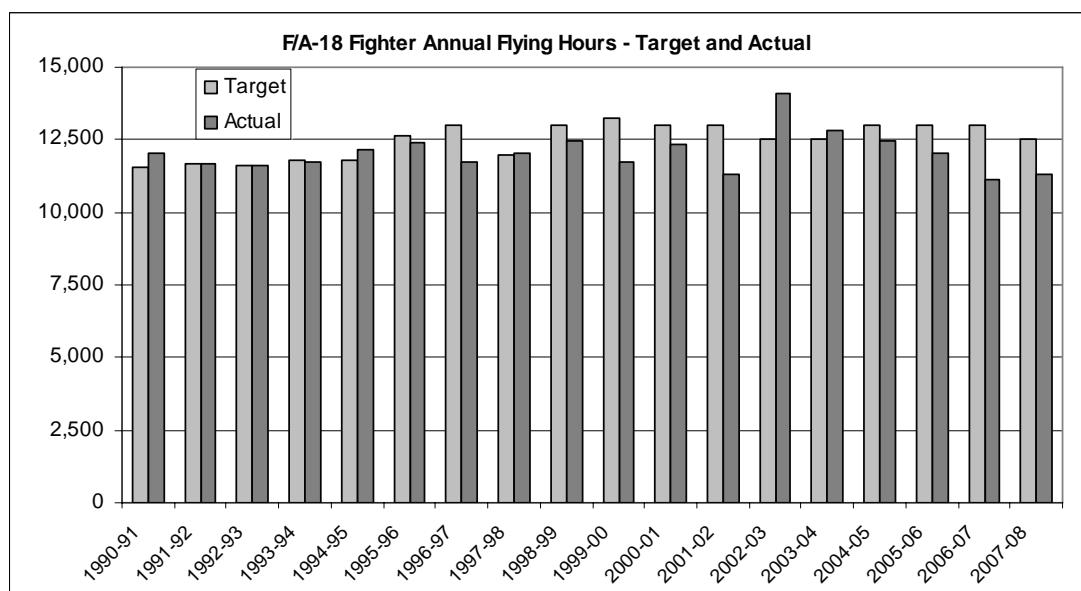
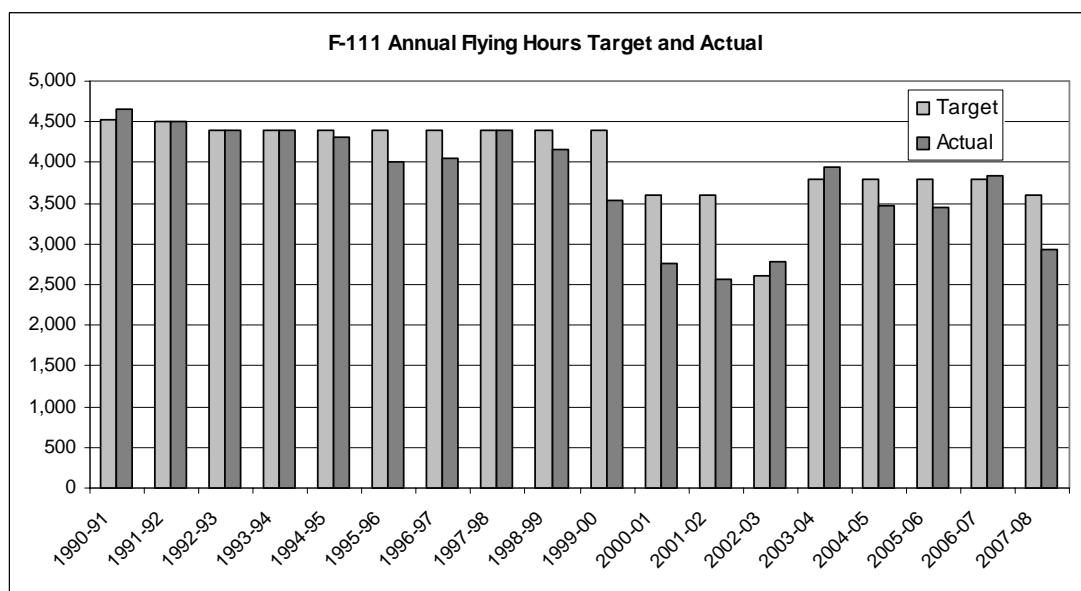
33 Hawk Lead-in-Fighters (LIF): these UK-made jet trainers provide a training capability for both the F-111 and F/A-18 aircraft.

4 PC-9(F) Forward Air Control aircraft: used to designate targets for the F/A-18 aircraft.

In 2007-08 flying hours were not met due to personnel shortages (LIF) and poor aircraft availability (F-111)

Past Performance

	Preparedness	Core Skills	Quantity
2000-01	Partially (F-111) Achieved (F/A-18)	Partially Achieved	Substantially Achieved
2001-02	Partially (F-111) Achieved (F/A-18)	Partially Achieved	Partially Achieved
2002-03	Partially (F-111) Achieved (F/A-18)	Partially (F-111) Substantially (F/A-18)	Partially Achieved
2003-04	Achieved	Achieved	Achieved
2004-05	Achieved	Achieved	Substantially Achieved
2005-06	Achieved	Achieved	Substantially Achieved
2006-07	Achieved	Achieved	Substantially Achieved
2007-08	Achieved	Achieved	Substantially Achieved



Program 1.4: Strategic Surveillance and Maritime Response

Overview

19 AP-3C Orion: 1970s vintage US-made maritime patrol aircraft. All 19 aircraft have been upgraded to AP-3C standard through an Australian-unique upgrade program. The AP-3C undertake maritime patrol, maritime surveillance, reconnaissance, offensive air support, surface & sub-surface strike, and search and survivor supply.

10 x Air Traffic Radar: including 9 fixed radar and one mobile, for the control of ADF air traffic.

4 x Tactical Air Defence Radar: ground based radar to detect hostile and own aircraft.

JORN Over the Horizon Radar network: Operational over-the-horizon radar network including radar sites in Laverton WA and Longreach Qld, and seventeen coastal beacons in the north of Australia and Christmas Island.

The network is run from the **Jindalee Operational Radar Network Correlation Centre** in Edinburgh, SA, and can detect both sea and air-borne moving objects. The Jindalee facility Alice Springs serves a research and development function. JORN is operated by No. 1 Radar Surveillance Unit.

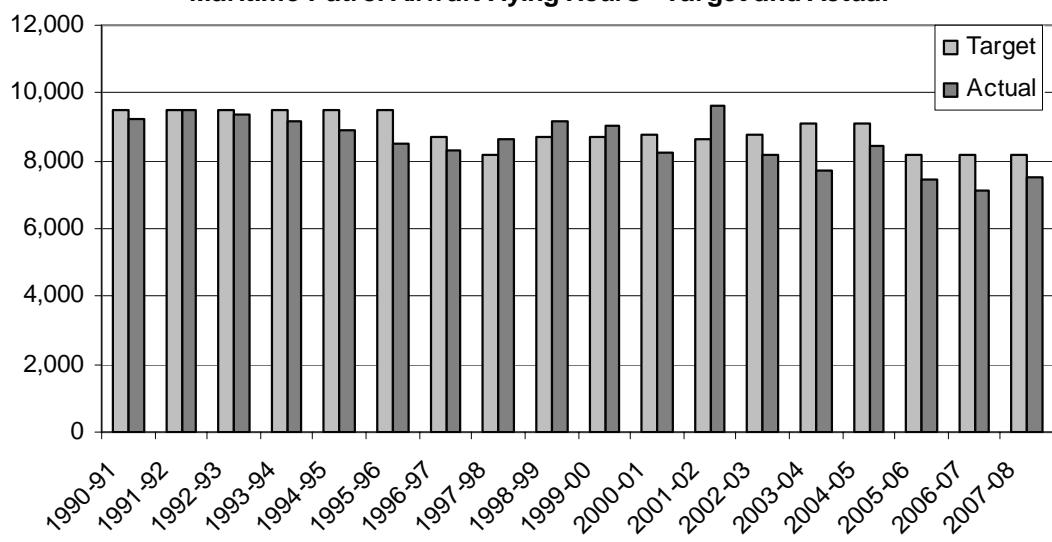
6 AEW&C Aircraft based on Boeing 737-700 IGW platforms are being acquired under project Wedgetail, one aircraft to fly 350 hours in 2008-09.

In 2007-08 core skills were not fully maintained because of ongoing high operational tempo.

Past Performance

	Preparedness	Core Skills	Quantity (P-3C)
2000-01	Partially Achieved Achieved (P-3C)	Partially Achieved Substantially (P-3C)	93% (8216 hours)
2001-02	Partially Achieved	Partially Achieved Substantially (P-3C)	111% (9624 hours)
2002-03	Substantially Achieved	Substantially Achieved	85% (8172 hours)
2003-04	Achieved	Achieved	85% (7,702 hours)
2004-05	Achieved	Achieved	93% (8,431 hours)
2005-06	Achieved	Achieved	91% (7,418 hours)
2006-07	Achieved	Substantially Achieved	86% (7,094 hours)
2007-08	Achieved	Substantially Achieved	92% (7,533 hours)

Maritime Patrol Aircraft Flying Hours - Target and Actual



Program 1.1: International Policy

Overview

Includes International Policy Division within Russell Offices and Defence attachés in foreign countries. According to the 2005-07 Defence Annual Report this Output 'provides strategic and international policy advice to the government to enable it to make sound judgements on, and develop appropriate response to, changes in Australia's strategic circumstances, and on specific issues as they arise'. It also makes recommendations to government on international engagement activities and initiatives.

In recent years, this Output has had to balance the demands of recurrent crises with the day-to-day ongoing management of defence international engagement; including the more than \$75 million a year Defence Cooperation Program that funds regional military-to-military activities and cooperation. Section 8 of this brief examines the Defence Cooperation program in some detail.

Past Performance: In the past three years this Output has achieved all or most of its performance targets, see recent Annual Reports for a very extensive narrative.

Program 1.5: Intelligence

Overview

Defence Intelligence Organisation (DIO) at Russell Offices in Canberra undertakes analysis of intelligence information from the full range of available resources. They produce reports, briefs and assessments on an ongoing basis as well as in response to emerging areas of concern. Topics range across military, economic, technical, scientific and political areas.

Defence Imagery and Geospatial Organisation (DIGO) includes a HQ at Russell Offices in Canberra and the Geospatial Information Branch in Bendigo. It acquires, processes and distributes imagery and geospatial intelligence including maps and charts. DIGO also sets technical standards for imagery and geospatial products.

Defence Signals Directorate (DSD) collects and distributes foreign signals intelligence (and is prohibited by law from collecting domestic intelligence) and provides information security advice, products and services to the government and ADF. DSD has its HQ in Russell Offices in Canberra and maintains collection facilities elsewhere.

Defence intelligence collection and analysis activities support ADF operations, Defence policy making including force development, and support wider government decision making. For more information see <http://www.defence.gov.au/intelligence/>.

Security is also the responsibility of the Intelligence and Security Group, which is the organisational element that largely aligns with this Output. A branch is devoted to this task.

Past Performance: See the most recent Annual Report for an extensive narrative – overall assessment is 'achieved'.

Program 3.1: National Support Tasks in Australia

Overview

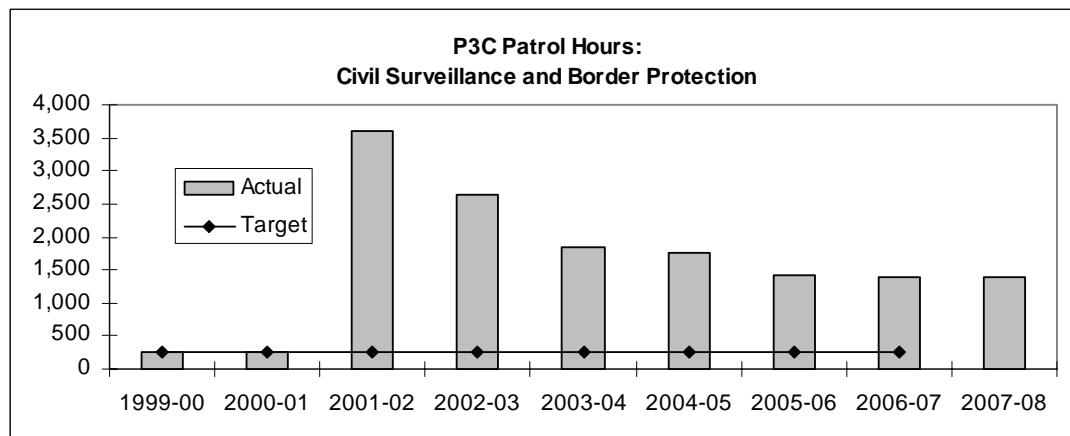
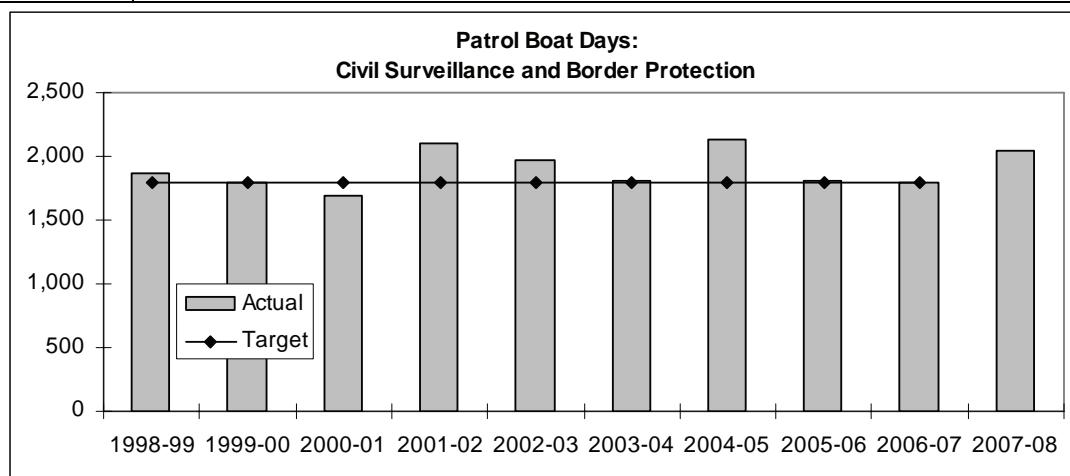
Under the Defence Act, the ADF can be directed to undertake national support tasks under the auspices of either 'aid to the civil authorities' or assistance to the civil community' depending on the nature of the task.

Defence's contribution to national support tasks ranges from the ongoing routine allocation of Patrol Boat and AP-3C Maritime Patrol Aircraft time, to the allocation of specific capabilities at short notice in a national support emergency. National support tasks include security, ceremonial, civil maritime surveillance, search and rescue, bush fire response and support to the Army / ATSIC community assistance program.

In 2007-08, ADF support to the civil surveillance program through Border Protection Command included 1,397 flying hours by AP-3C surveillance aircraft and 2,042 Armidale-class patrol boat days. In previous years, 240 Regional Surveillance Unit (RSU) patrol days have also been provided.

Past Performance

* estimate	Preparedness	Core Skills	Quantity
2000-01	Achieved	Not Reported	Substantially Achieved
2001-02	Achieved	Not Reported	Achieved
2002-03		Achieved	
2003-04		Achieved	
2004-05		Achieved	
2005-06		Achieved	
2006-07		Achieved	
2007-08		Achieved	



Section 2.7: Explanatory Tables and Budgeted Financial Statements

[PBS Section 3: pp. 95 – 122]

The budgeted financial statements for Defence appear in Section 3 of the PBS. The only notable change is that consolidated financial statements for Defence and DMO have been included for the first time. This is a commendable initiative.

Section 2.8: Defence Materiel Organisation PBS

[PBS Part Two: pp. 125 – 179]

On 1 July 2005 DMO became a prescribed agency under the *Financial Management and Accountability Act 1997*. Since then it has had its own independent part in the Defence portfolio PBS.

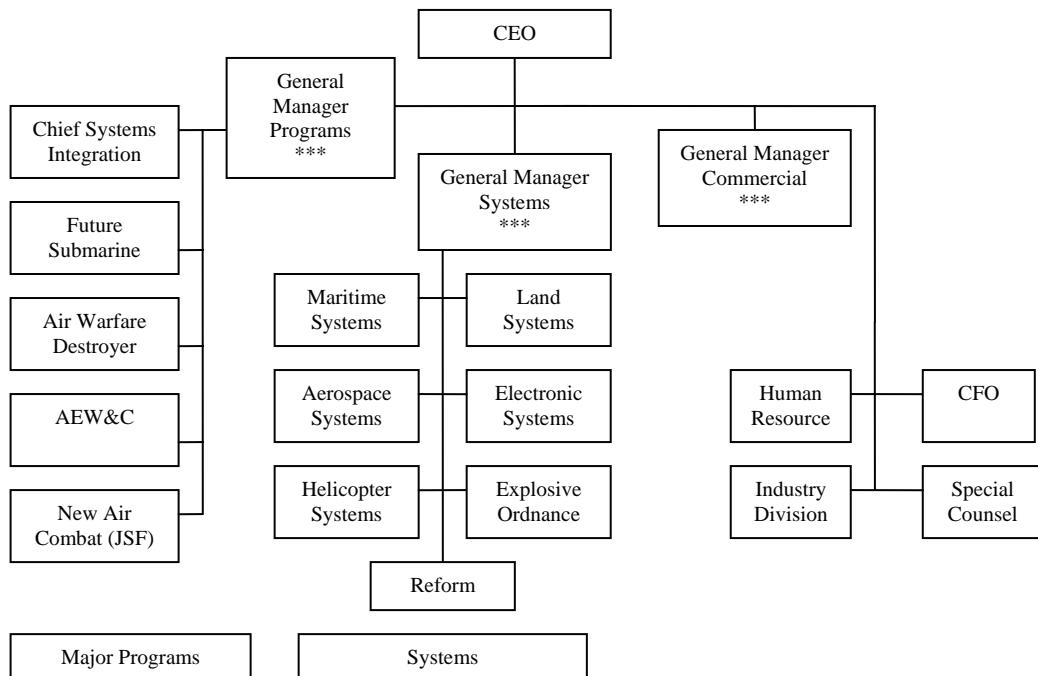
Overview

DMO acquires and supports equipment for Defence on a quasi-commercial basis. It is an independent entity from a financial perspective, but administratively is somewhat of an agency within an agency (hence the PBS within a PBS).

Organisational structure

DMO is divided into sixteen divisions, each headed by a band-2 SES civilian or 2-star military officer, as shown in Figure 2.8.1. In 2007-08 two additional deputy secretary level General Manager roles were created to ‘assist the CEO to focus on his strategic leadership role’.

Figure 2.8.1 DMO Organisational structure



Source: 2009-10PBS, p. 128

The divisions fall into three categories:

‘*Systems*’ divisions are set up on the traditional environmental domains of land, sea, and air, plus divisions dealing with electronics/weapons and explosives. They manage and deliver the vast bulk of the 210 major equipment acquisition projects (and more than 150 minor acquisition projects) that DMO is responsible for, and take care of the materiel support of existing capabilities—some 100 major fleet groupings—across all domains.

‘*Programs*’ divisions acquire high profile capabilities of strategic significance. That is, if a project is big, important (and politically sensitive) enough it gets its own dedicated division. At the moment there are four such programs: Air Warfare Destroyer, AEW&C, New Air Combat Capability (Joint Strike Fighter) and the Future Submarine. In addition, there is a fifth division headed by the Chief of Systems Integration.

Four ‘*Corporate*’ divisions provide the full range of corporate services including those of the Human Resource Management and Corporate Service, Chief Financial Officer (CFO) and General Counsel (legal). In addition, there is an industry division that manages DMO’s relationship with industry.

A prescribed agency

The September 2003 report from the Defence Procurement Review (known usually as the Kinnaird Review) recommended a number of changes to Defence and DMO. Key among them was to establish DMO as a separate executive agency. After consideration, the government decided to take the lesser step of making DMO a ‘prescribed agency’, which nevertheless still delivers a high degree of autonomy.

As a prescribed agency, the CEO of DMO is accountable directly to the Minister for Defence for financial matters, hence the need for separate financial statements. On other matters, DMO still remains close to Defence from an administrative perspective; the CEO being accountable to the Chief of the Defence Force through the *Defence Act 1903* and to the Secretary through the *Public Service Act 1999*.

Resources for 2009-10 [PBS p. 129-130]

DMO will incur expenses of \$11.85 billion in 2009-10. Sources of funding to cover these expenses include:

Departmental Appropriation from government to pay for policy advice and management services. In 2009-10, this will be \$851 million.

Revenues from Defence in payment for acquisition and sustainment services from Defence. In 2008-09 this totals \$10,765 million.

Drawdown of special account: \$115 million of unspent funds from prior years will be spent in 2009-10 by running down the residual in the DMO special account.

Non-appropriation receipts including things like the disposal of commercial vehicles and payments from foreign forces for materiel services provided. In 2009-10 this will amount to \$71 million, this would be called own-source revenues in Defence.

Because DMO presents its resourcing differently to Defence, we have reconstructed how the expenses are resourced as best as we can in Table 2.8.1, the residual difference is likely an accrual factor we have been unable to track down.

Table 2.8.1: DMO funding 2008-09 (\$ '000s)

Funding from government			
Sustainment	4,871,800	Table 13, p. 25	
Acquisition	5,890,300	Table 13, p. 25	
DMO budget measures	3,300	Table 13, p. 25	
subtotal	10,765,383	Table 59, p. 130	
Departmental Appropriation	851,082	Table 59, p. 130	
Drawdown of special account in 2009-10	115,295	Table 71, p.173	
Non-appropriation receipts	71,965	Table 59, p. 130	
Total	11,803,725		
Cost of DMO Outcome	11,850,699	Figure 6, p. 134	
Difference	- 46,974		
Expenses not requiring funding	39,638	Table 64, p. 137	
Funding Gap	7,336		

Source: 2009-10 PBS

DMO Special Account

Unspent funds have accumulated in the DMO Special Account in recent years. Table 2.8.2 calculates the net money deposited and withdrawn from the account since 2005-06. In effect, the residual in the Special Account represents delayed spending that is not disclosed in Defence's accounts. At least some of the funds represent 'reprogramming' of major capital equipment investment that is not reflected elsewhere in Defence reporting.

Table 2.8.2: DMO funding 2008-09 (\$ '000s)

	Opening balance	Closing balance	Net change
2005-06	0	167,205	167,205
2006-07	167,205	542,852	375,647
2007-08	542,852	987,862	445,010
2008-09	987,862	927,341	-60,521
2009-10	927,341	812,048	-115,293

Source: 2009-10 PBS and various DAR

Purchaser-provider arrangements

Central to the resourcing framework for DMO are purchaser-provider arrangements with Defence for acquisition and sustainment services. In 2008-09, DMO will receive \$5,890 million through *Materiel Acquisition Agreements* with Defence, and another \$4,872 million through *Materiel Sustainment Agreements*. In addition, there are several *Shared Services Agreements* (for which no payment is made) that cover such services as payroll, accommodation, and banking services provided by Defence, and contracting policy and advice provided by the DMO. A useful breakdown of the payments to DMO appears on pages 25 of the PBS. It includes the amount of money to be spent on various categories of acquisitions and sustainment support.

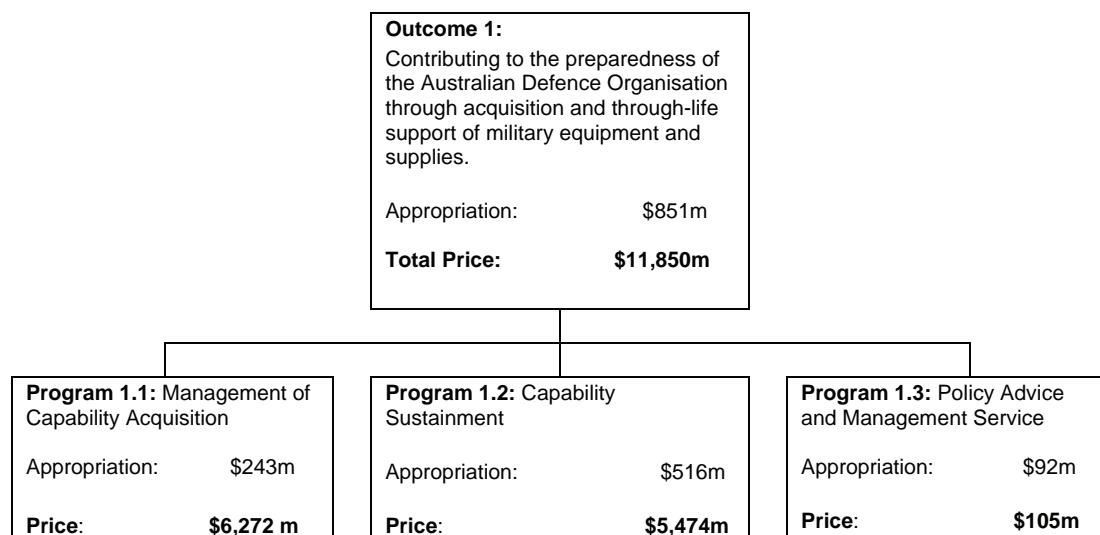
DMO also expects to make use of some 2,110 military personnel whose salaries and other personnel expenses are counted in Defence's financial statements. DMO pays Defence for the services provided by these personnel, as a suppliers expense (rather like payments made to companies for contractor staff). Total payments from DMO to Defence will amount to \$346 million in 2009-10.

Outcomes and programs [p. 133]

As a prescribed agency DMO has its own outcome/program structure as detailed in Figure 2.8.2.

The first two programs are predominantly funded through the Materiel Acquisition and Sustainment Agreements with Defence, while the third is mainly funded through the Departmental Appropriation. Note that DMO refers to the ‘price’ of outputs rather than ‘net cost’ as in Defence.

Figure 2.8.2 DMO Output prices 2008-09



Source: Table 6 p.134 of the 2009-10 PBS

Outcome and planned performance [p. 135]

The PBS sets performance targets for the three DMO outputs and outlines how they will be evaluated. We have reproduced the essential features in Table 2.8.3.

Table 2.8.3: DMO program objectives performance indicators

Program	Objective	Performance Indicators
Program 1.1 Management of Capability Acquisition	Acquisition projects will be delivered, in a transparent and accountable manner, on time, within budget and to the required standard as identified in the specific Materiel Acquisition Agreements.	The indicators vary with each project and are specified in the Materiel Acquisition Agreements.
Program 1.2 Capability Sustainment	The ADF and its capabilities will be sustained to meet operational requirements as identified in the specific Materiel Sustainment Agreements.	Indicators are included in individual Materiel Sustainment Agreements. The DMO reports to its customers against these.
Program 1.3 Policy Advice and Management Services	The DMO will meet Ministerial, government, Defence and DMO expectations and timeframes for the provision of policy, advice and support.	The DMO meets Ministerial, government, Defence and DMO expectations and timeframes for provision of policy, advice and support.

Management of Capability Acquisition – Program 1.1

Each of the 210 major acquisition projects undertaken by DMO has a Materiel Acquisition Agreement with Defence that specifies scope, schedule and budget. The PBS summarises the top-30 acquisition projects by expenditure in 2009-10 (see top-30 projects below). Agreements also exist to cover the minor acquisition projects DMO manages. In 2007-08 and 2009-10, the variation to project cost approvals for the top-30 projects was provided [2008-09 PBS Table 2.5.5 & 2.5.6, p. 168-9]. This has been discontinued in the 2009-10 PBS. As elsewhere in the PBS, transparency and disclosure has declined.

Capability Sustainment – Output 1.2

On pages 161 to 170, the PBS details the goals and challenges for 2009-10 in the area of capability sustainment. Such detail, which was first provided in the 2005-06 PBS, gives a useful insight into the range of activities undertaken. In general, capability sustainment include repair and maintenance, engineering, supply, configuration management and disposal, as well as the provision of spares, technical data, support and test equipment, training equipment and explosive ordnance. For the third year in a row, the top-20 sustainment products by weapons system has been given [PBS Table 69 p. 162], we discuss this new information below.

Policy Advice and Management Service – Output 1.3

This includes contracting and procurement policy advice for Defence and the DMO, industry policy and advice to Defence and the government, and corporate reporting requirements. Key performance targets for this output are given on page 171 of the PBS and relate primarily to advice to government and effective corporate governance and reporting.

The ‘Top Twenty’ sustainment products

The top 20 sustainment activities for DMO by forecast expenditure from Table 69 in the PBS are listed in Table 2.8.4, 2.8.5, 2.8.6 and 2.8.7 along derived figures based on planned rates of effort. These include per-platform and per-flying-hour costs. Where possible, comparisons with previous year’s costs have been included

Table 2.8.4: Top 20 sustainment products – aerospace and helicopters

	Number	Cost (\$m)	Hours flown	Annual cost per platform	Cost per flying hour
Super Hornet*	24	133	900	\$5,541,667	\$147,778
F-111	18	87	2,700	\$4,833,333	\$32,222
AP-3C Orion	19	133	7,900	\$7,000,000	\$16,835
F/A-18 Hornet	71	129	12,000	\$1,816,901	\$10,750
Hawk LIF 127	33	96	8,000	\$2,909,091	\$12,000
C-130J	12	111	7,350	\$9,250,000	\$15,102
C-17	4	68	4,000	\$17,000,000	\$17,000
MRH-90	15	127	2,820	\$8,466,667	\$45,035
Seahawk	16	85	3,400	\$5,312,500	\$25,000
Black Hawk	34	84	8,600	\$2,470,588	\$9,767
ARH Tiger	22	107	6,000	\$4,863,636	\$17,833

Source 2009-10 PBS, *The high per-hour cost for the Super Hornet is a reflection of the low flying our rate accompanying its introduction to service. When the platform enters service in full, the cost per hour is expected to fall substantially.

Table 2.8.5: Recent sustainment costs per unit – aerospace and helicopters

	Cost per aircraft (\$ million)			Cost per flying hour		
	2007-08	2008-09	2009-10	2007-08	2008-09	2009-10
Super Hornet	\$0.00	\$0.00	\$5.54	\$0	\$0	\$147,778
F-111	\$8.11	\$6.67	\$4.83	\$49,778	\$37,500	\$32,222
AP-3C Orion	\$6.37	\$7.21	\$7.00	\$16,063	\$17,342	\$16,835
F/A-18 Hornet	\$1.68	\$1.87	\$1.82	\$10,530	\$11,565	\$10,750
Hawk LIF 127	\$2.88	\$2.67	\$2.91	\$15,183	\$11,579	\$12,000
C-130J	\$5.42	\$10.58	\$9.25	\$14,130	\$18,143	\$15,102
C-130 H		\$5.08			\$19,063	
C-17	\$13.75	\$23.50	\$17.00	\$26,166	\$23,500	\$17,000
MRH-90		\$47.50	\$8.47		\$158,333	\$45,035
Seahawk	\$4.94			\$31,066		\$25,000
Black Hawk	\$1.97	\$2.15	\$2.47	\$10,555	\$9,733	\$9,767

Source: 2007-08 DAR, 2008-09 PAES, 2009-10 PBS

The above figures need to be treated with caution. Various fleets enjoy different amounts of contracted support (the cost of which is included) and manpower support from Defence's own workforce (which is not included). More generally, there are usually other costs (like fuel) that are not included separately for each platform. Also, one-off costs can heavily influence the results, including when platforms are first being brought into service. It will be some years before useful trends emerge.

Table 2.8.6: Top 20 sustainment products – maritime

	Number	2007-08 (\$m)	2008-09 (\$m)	2009-10 (\$m)
Collins- subs	6	33	304	329
Anzac frigate	8	219	270	231
FFG Frigate	4	103	113	105
Mine Hunter Coastal	6	61	58	-

Source: 2007-08 DAR, 2008-09 PAES, 2009-10 PBS

Table 2.8.7: Top 20 sustainment products – miscellaneous

	2007-08 (\$m)	2008-09 (\$m)	2009-10 (\$m)
ADF Clothing and Equipment	117	94	116
ADO Commercial Fleet	73	82	77
B Vehicles	117	117	134
Explosive ordnance	357	453	345
Wide Area Surveillance	77	75	73
Battlespace Communications	32	105	
Fuels and Lubricants	422	428	476

Source: 2007-08 DAR, 2008-09 PAES, 2009-10 PBS

People

The DMO workforce is a mixture of military personnel, civilians and contractors as detailed on p.131 and 132 of the PBS. The key information is collected in Table 2.8.8 overleaf.

The civilian and military personnel in DMO are held under slightly different arrangements. Civilians in DMO are Defence employees and the CEO of DMO has delegations from the Secretary of the Department that he exercises in this regard. The

expenses associated with DMO's civilian workforce appear in their financial statements as employee expenses.

In contrast, the military personnel in DMO are provided through a purchaser-provider arrangement with Defence. This does not cover the full per-capita cost of the military personnel, but rather represents a payment for their services roughly corresponding to their costs exclusive of allowances and overheads specific to their military role (and this is broadly commensurate with what would be needed to secure similar skills in the labour market). Thus, if the military fail to deliver sufficient personnel (due, for example, to operational demands or shortages) DMO has the money to hire people from outside.

Table 2.8.8: Workforce summary for DMO (average funded strength)

	2004-05 Actual	2005-06 Actual	2006-07 Actual	2007-08 Actual	2008-09 Est.	2009-10	2010-11	2011-12	2012-13
Navy	306	277	281	277	353	367	374	381	381
Army	461	411	389	386	466	500	525	538	538
Air Force	770	762	763	794	940	928	978	963	963
subtotal	1,537	1,450	1,433	1,457	1,759	1,795	1,877	1,882	1,882
Civilian	4,363	4,502	4,951	5,304	5,496	5,764	5,858	5,951	6,116
Reserve	125	191	249	311	302	315	315	315	315
PSP	388	393	298	181	167	164	160	157	157
Total	6,413	6,536	6,931	7,253	7,724	8,038	8,210	8,305	8,470

Source: DAR, 2009-10 PBS.

The 'Top Thirty' projects

The PBS lists the top 30 major capital equipment projects by 2009–10 expenditure [PBS Table 66 page 139] and provides a description of each. We reproduce the top-30 projects in Table 2.8.9 overleaf. This year, ASPI has again commissioned a team of defence specialist journalists to prepare reports on interesting recent and current projects (see Section 8 of this brief). The PBS also includes a listing of previously approved top-30 projects that is useful (Tables 67, p. 155).

Table 2.8.9: Top 30 Defence Major Capital Equipment Projects (million \$)

Project	Project Number	Approved Project Expenditure	Spend to 30 June 2009	2009-10 Budget Estimate
Aerospace				
AP-3C Electronic Support Measure Upgrade	AIR 5276 Phase 8B	129	27	33
AP-3C Capability Assurance Program	AIR 5276 CAP1	91	14	28
F/A-18 Hornet Upgrade	AIR 5376 Phase 2	2,031	1,349	159
F/A-18 Hornet Upgrade - Structural Refurbishment	AIR 5376 Phase 3.2	910	252	61
ADF Air to Air Refuelling Capability	AIR 5402	2,038	878	425
Airborne Early Warning and Control Aircraft	AIR 5077 Phase 3	4,089	2,549	97
Air Warfare Destroyer Program				
Air Warfare Destroyer – Build	SEA 4000 Ph3	7,197	1,140	1,137
Bridging Air Combat Capability – Super Hornet				
Bridging Air Combat Capability Super Hornet	AIR 5349	4,178	1,059	1,401

	Phase 1			
Electronic Systems Division				
Next Generation Satellite Program	JP 2008 Phase 4	1,081	83	126
Ultra High Frequency Satellite Communications	JP 2008 Phase 5A	292	35	89
New Air Defence Command and Control Systems	AIR 5333	271	174	27
EWSP for Selected ADF Aircraft - Echidna	AIR 5416 Phase 2	313	221	41
Tactical Information Exchange Domain	JP 2089 Phase 2A	105	5	37
Explosive Ordnance Division				
Follow-on Standoff Weapon	AIR 5418 Phase 1	420	162	33
Lightweight Torpedo Replacement	JP 2070 Phase 3	321	132	72
Bridging Air Combat Capability - Weapons	JP 5349 Phase 2	222	30	60
Mulwala Redevelopment Program	JP 2086 Phase 1	368	146	84
Evolved Sea Sparrow Missiles	SEA 1428 Phase 4	93	47	28
Helicopter Systems Division				
Armed Reconnaissance Helicopter	AIR 87 Phase 2	2,027	1,491	203
Multi Role Helicopter	AIR 9000 Phase 2	4,076	1,155	429
Land Systems Division				
Upgrade of M-113 Armoured Vehicles	LAND 106	892	446	115
Bushmaster Infantry Mobility Vehicle	LAND 116 Phase 3	912	481	114
Overlander Field Vehicles	LAND 121 Phase 3	2,919	20	43
Maritime Systems Division				
Guided Missile Frigate Upgrade	SEA 1390 Phase 2	1,527	1,281	77
Standard Missile Replacement (SM-1)	SEA 1390 Phase 4B	629	243	58
New Heavyweight Torpedo	SEA 1429 Ph2	469	248	34
Anzac Anti-Ship Missile Defence	SEA 1448 Phase 2B	450	136	131
Amphibious Deployment and Sustainability	JP 2048 Ph4A/4B	3,412	354	615
Military Integrated Logistics Information System				
Improvements to the Logistics Information Systems	JP 2077 Ph2B.1	128	93	26
New Air Combat Capability				
Detailed Analysis and Acquisition Planning	AIR 6000 Phase 1B	109	72	26
TOTAL TOP 30 APPROVED PROJECTS		42,505	14,323	5,820
Other Approved Project Estimate		34,117	29,284	665
Total Program		76,622	43,607	6,485
Management Margin (19% slippage)				-1,223
Net from existing projects				5,262
Projects Planned for Government Approval				579
Total Funds Available				5,841

Source: 2009-10 PBS

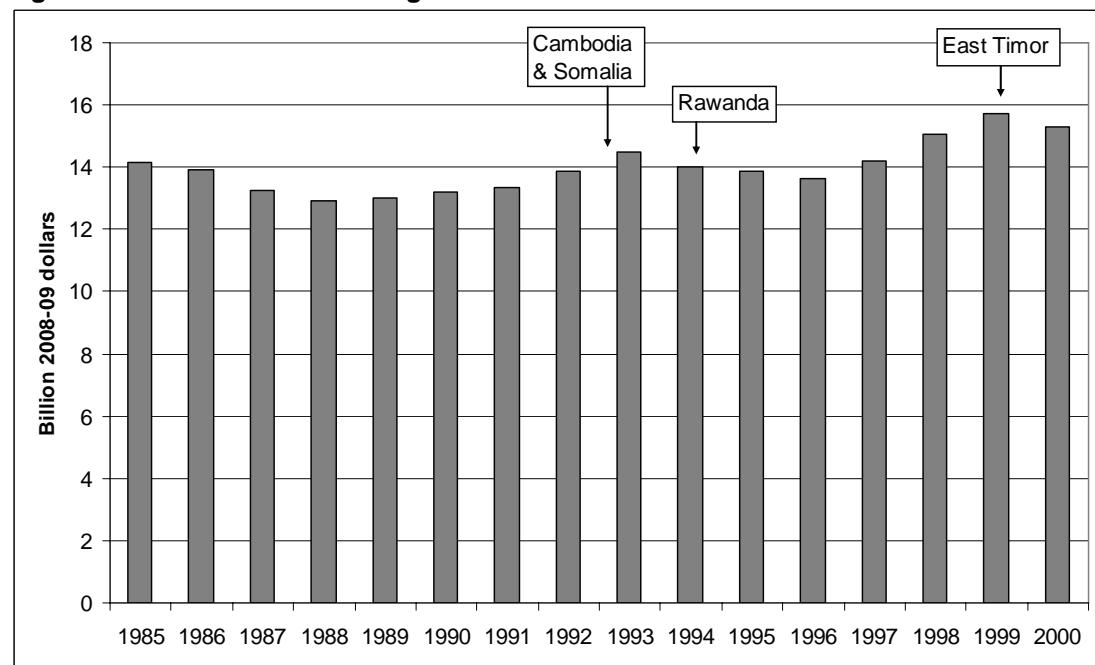
SECTION 3 – DEFENCE FUNDING AND THE WHITE PAPER

This Section deals with defence funding in general and the impact of the 2009 Defence White Paper in particular. It is divided into four parts: (1) a survey of Australian defence funding from the mid-1980s through the 1990s; (2) an obituary for the 2000 Defence White Paper; (3) a reckoning of the funding initiatives that arose between 2000 and this year's White Paper; and (4) an analysis of the goals and prospects for the 2009 Defence White Paper. For ease of reference, we shall refer to the 2000 and 2009 Defence White Papers as *Defence 2000* and *Defence 2009* respectively.

The lean years: 1985-2000

The late 1980s and 1990s were lean years for Defence. Apart from fluctuations due to foreign exchange movements and operational supplementation, defence spending was kept more-or-less constant in real terms across the period. In fact, the Defence budget was higher in 1985-86 (\$14.5 billion) than it was eleven years later in 1996-97 (\$13.7 billion) as measured in real 2008-09 dollars. Figure 3.1 shows real defence funding from 1985-86 to 2000-01. Major deployments are shown so that the impact of operational supplementation can be discerned.

Figure 3.1: Real Defence funding 1985-86 to 2000-01



Source: DAR

Because the cost of maintaining military capability exceeds inflation by 2–3%, the Defence budget came under growing pressure as the years went by. To try to close the gap between means and ends, successive governments pursued ‘efficiency’ programs of one sort or another. The first such initiative was the 1990 Commercial Support Program which systematically market tested ‘non-core’ activities for outsourcing. By 2004 around 16,000 uniformed and civilian positions had been tested and almost \$6 billion of contracts awarded to the private sector.

Whatever early savings the Commercial Support Program delivered, they were inadequate to stop reductions to the defence force. In 1991 the Force Structure Review cut the permanent force by 6,530 positions and removed 2,760 civilians (exclusive of outsourcing). Although an additional 4,100 Ready Reserve positions were created, the capability of the defence force was significantly eroded as a result—in particular by reducing the number of infantry battalions from six to four.

By the late 1990s, it was clear that—despite the cuts and efficiencies—there was not enough money in the budget to modernise the force and maintain its readiness. As a result, the preparedness of the force was steadily eroding and the replacement of key weapons systems was being delayed. Faced with the prospect of an increasingly obsolete and poorly prepared defence force, the then government initiated the Defence Efficiency Review in 1996 which led to the Defence Reform Program in 1997.

The Defence Reform Program sought to save around \$1 billion a year in recurrent spending from a budget of \$10 billion (both figures then-year) and deliver around \$442 million in one-off savings. Through a combination of restructuring and an acceleration of the Commercial Support Program, up to 12,200 military and 9,300 civilian jobs were proposed for cuts or outsourcing.

Although savings of around \$644 million were claimed by Defence from the Defence Reform Program, the actual result remains unclear. In the end, the savings were used to ‘buy back’ military positions—supposedly to bolster capability. While this sounds positive, the fact remains that no new ships, planes or battalions (i.e. no new capability) became available as a result of the ‘buy back’. In addition, cuts to civilian numbers were soon reversed. Whatever savings the Defence Reform Program did actually achieve, they did little to arrest growing budget pressures.

By the end of the decade, Defence was in a sad state: the permanent force had shrunk by more than 20,000 positions compared with the mid-1980s; the ‘train wreck’ of block obsolescence was getting closer with no money in sight for modernisation; the preparedness of the force was poor with many fitted-for-but-not-with platforms and others badly in need of upgrade; and logistics was hollow and underfunded. It was against this background that the then government decided to develop a White Paper in 1999 with the aim of putting Defence planning and funding on a sustainable footing.

The tumultuous events of East Timor in 1999 delayed the White Paper until the end of 2000. But it was perhaps a delay worth broking. East Timor was the largest Australian operation since Vietnam and it stretched parts of the defence force severely. In the process, serious shortcomings were exposed with equipment, logistics and preparedness. It is unlikely that the government would have been as generous in 2000 had events not been what they were.

The 2000 White Paper: 2000-2009

The only Defence White Paper produced by the previous government, *Defence 2000*, sought to achieve a coherent package of strategy, capability and funding for Australia's defence for the decade 2001-02 to 2010-11. Like its predecessors from 1976, 1987 and 1994, *Defence 2000* described our strategic circumstances and detailed the role of Australian military power in dealing with the challenges therein. *Defence 2000* departed from its predecessors in the details it provided on capability development plans and funding.

On the capability side, a *Defence Capability Plan* was published that detailed 165 separate phases of 88 capability proposals valued at around \$50 billion planned for the forthcoming decade. Information provided for each project included its scope (what it would deliver), year-of-decision (when the government would make a final decision), in-service-date (when an initial operational capability would become available), and cost range. While unclassified 'Pink Books' have been available in the past; they did not have the detail nor extended time-horizon of the *Defence Capability Plan*.

The entire package, including new and pre-existing capability, was funded through a decade-long funding envelope that roughly equated to 3% average real growth across the decade. Although earlier White Papers had alluded to near-term funding levels, never before had a decade-long funding commitment been made—let alone one with a talisman-like goal of '3% real growth'.

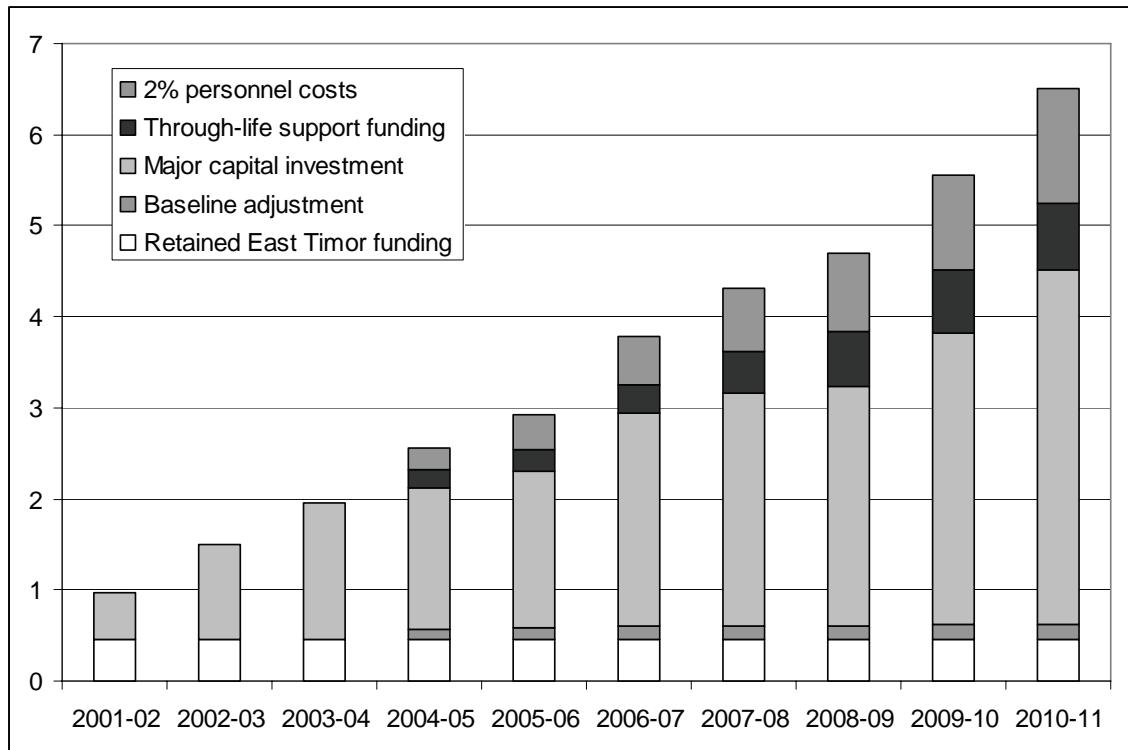
Defence 2000 provided more than \$30 billion spread across four categories (all figures are in 2008-09 PBS prices):

- \$21 billion for the purchase of major capital equipment
- \$3.2 billion to cover the through-life support costs of new capabilities planned to enter service as a result of the DCP
- \$5 billion to cover an expected annual 2% growth (above inflation) in personnel costs. (In the 2004-05 Budget additional funding was provided to cover a 2.5% per annum real increase in military personnel expenses.)
- \$1 billion to augment the operating cost baseline in the Defence budget. This included offsetting shortfalls in Defence Reform Program savings, and partially fixing the logistics shortfall caused by redirecting savings to 'buy-back' military personnel.

The original White Paper's funding profile appears in Figure 3.2 where the various funding items have been identified. In addition, Defence was allowed to retain around \$450 million of unspent operational supplementation from East Timor within their annual funding base.

As Figure 3.2 shows, the overwhelming focus of the explicit *Defence 2000* was on buying new equipment for the defence force. That said, the retention of East Timor supplementation added substantially to the baseline budget.

Figure 3.2: Funding provided by the 2000 Defence White Paper



Source: DAR and 2008-09 PBS

After 2000, the 3% percent funding commitment was extended out to 2017-18 in the 2006 and 2008 budgets. Before turning to look at these and other funding measures from the past eight years, it's worth pausing to look back at *Defence 2000* and ask how far Defence has got in delivering on the goals set at the start of this decade. With a new White Paper now in place, it is time to write the obituary for *Defence 2000* and move on to the future.

At the risk of oversimplification, *Defence 2000* explicitly sought to:

- modernise the ADF by replacing or upgrading ageing assets and introducing new capabilities in select areas
- improve the preparedness of the ADF so that it was made up of ‘fully developed capability’ rather than hollow units and fitted-for-but-not-with platforms
- boost the capability of the ADF to undertake expeditionary operations in the immediate region
- sustainably align Defence plans and funding.

With only two years before the end of the original White Paper funding period, it is possible to assess progress made towards each of these goals.

Capability development

Relative to the goals of *Defence 2000*, progress in delivering new and upgraded equipment has been much slower than anticipated. Table 3.1 lists a selection of major capabilities from the original Defence Capability Plan that were supposed to have an initial operational capability prior to or in 2010-11. Note that this list is not

exhaustive, nor does it include projects planned to commence during the decade but deliver capability after 2010-11 (for which delays abound also).

Table 3.1: The long wait – the slippage of initial operational capabilities

Project	Cost (millions)	Original planned date	Latest planned date
Armed reconnaissance helicopters	\$2,077	2004-05	2010
Multi-role helicopters	\$4,076	2007	2010
Air defence command and control	\$271	2003	2009-10
Air refuelling capability	\$2,038	2006	2010
Global Hawk – unmanned reconnaissance	~ \$1,250	2007	post-2015
Artillery replacement	~ \$525	2008 to 2010	2011-2013
New heavyweight torpedo	\$469	2006	unknown

Source 2001 DCP and subsequent disclosures

There are several reasons for these delays. To some extent, changing priorities have seen new projects like the \$550 million Abrahams tank acquisition displace pre-existing projects. More generally, the delays represent hold-ups in either the capability definition process (where projects are refined and approval is sought from government), the acquisition process (where DMO engages industry to deliver the equipment), or because the non-materiel components of capability (like personnel, training and doctrine) are not ready. Examples in each category are easy to find.

Table 3.2 lists the projects from last May that were planned for 2nd pass approval in financial year 2008-09. As can be seen, with only a month to go in the year, progress has been limited. (Though it should be acknowledged that three non-listed projects were considered, or will be considered, in 2008-09.)

Table 3.2: Projects scheduled for approval in 2008-09

Project	Status
Additional radar warning receiver for helicopters	-
Seahawk capability assurance program	1 st pass only
JSF acquisition	-
Artillery replacement	considered or to be considered
Direct Fire support weapon	considered or to be considered
Soldier enhancement - #2	-
Joint counter improvised explosive device	1 st pass only
Mounted battlefield command support system	-
Computer network defence	considered or to be considered
Tactical data links	considered or to be considered
Collins submarine obsolescence management	-
Radar warning receiver for C-130J	-
IR counter-measures for C-130J	-
C-130J block upgrade program	partially approved

Source: 2008-09 PBS and subsequent disclosures

If past experience is anything to go by, most of the projects that have not yet been approved will remain so at the close of the financial year. It could be argued that the 2009 White Paper prevented the projects from being considered. There are two counters to this. First, the list of projects for approval in 2008-09 was formulated *after* the commencement of the White Paper. Second, significant delays to the approval of projects are routine even when there is no White Paper.

On past experience, the slower than planned approval of projects probably reflects compounding delays within Defence's internal processes and the National Security Committee of Cabinet.

And there is another factor at play. Over the longer-term, projects tend to be approved more slowly than anticipated because initial cost estimates often prove to be overly optimistic. The simple fact is that for every project that exceeds its cost estimate, other projects must be delayed to accommodate its increased cost within the fixed funding available. Examples of large cost increases from the 2001 Defence Capability Plan are easy to find. The Additional Trooplift Helicopter project grew from around \$400 million to \$954 million at the time of approval (139%), the Air Warfare Destroyer project grew from around \$4 billion to \$7.5 billion (89%), and the Amphibious Vessels grew from around \$1.25 billion to \$2.9 billion (136%).

Even when projects are approved on schedule, there is no guarantee that they will be delivered on schedule. The combination of delays within DMO, industry capacity constraints and non-delivery of projects by suppliers all adds to the time it can take for projects to deliver usable equipment. Where projects carry significant technical risk, the extent of delays can be appreciable. Table 3.3 lists delayed projects from among the top-30 reported in this year's budget papers. The delays are measured relative to the original contracted delivery schedule. We have not attempted to track down each and every delay, but have instead simply collected those disclosed in the recent PBS and Defence Annual Reports.

Table 3.3: Delays against contracted delivery

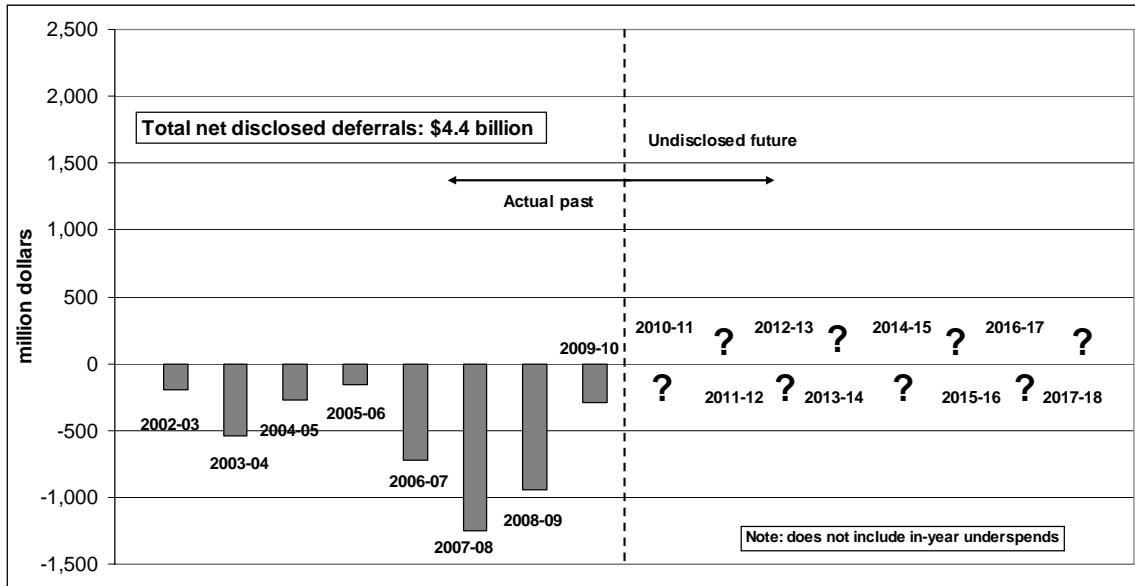
Project	Status
Armed reconnaissance helicopters	27 months
AP-3C electronic support measures upgrade	12 months
Airborne early warning and control program	40 months
FFG upgrade project	60 months
Lightweight torpedo	48 months
Air defence command and control	30 months
M113 upgrade	13 months

Source: 2008-09 PBS and subsequent disclosures

The combination of delayed approvals and delayed projects has seen Defence unable to spend all the money it has asked to purchase new equipment. Over the period covered by *Defence 2000*, we estimate that at least \$4.4 billion of planned investment has been deferred into the future. The actual figures are probably higher but we cannot be sure because the government has not disclosed the full extent of the deferrals in the 2009-10 Budget. While not every dollar of delayed spending necessarily reflects delayed capability—rescheduled payments and cost reductions could see spending slip without delaying capability—the overall trend is not encouraging.

Figure 3.3 shows how money originally earmarked for major capital equipment has been deferred. The deferrals in the 2009-10 PBS have not been disclosed beyond 2009-10. As mentioned in Section 2, the only hint we have is that the capital budget appears to have been cut by \$3.5 billion (PBS Table 16 verses Table 47) over the next four years—though we cannot be sure. Equally, we do not know how far into the future any of the money has been shifted now that reprogramming is no longer disclosed.

Figure: 3.3: Delayed spending



Source: Defence Budget Papers and DAR

Even when money can be spent and a weapons system is actually delivered, it does not amount to a usable military capability unless the other components of capability like trained personnel, logistical support and doctrine are also ready. For example, the delay in delivering an operational capability with the Armed Reconnaissance Helicopters is due to delays in qualifying instructors and delivery of simulators.

The net result of all these factors is that a great deal of combat capability intended for the ADF has been delayed for a long time. No matter how you look at it, it is clear that after eight years many of the stated capability goals of the *Defence 2000* remain elusive.

Fully developed capability

One of the lessons from East Timor in 1999 that *Defence 2000* took up was the need to maintain the ADF at a higher state of preparedness than had been the case. Accordingly, over the past eight years Defence has worked hard to boost its preparedness and improve the way it manages and reports preparedness. Good progress has been made in many areas as a result.

Each year from 2000-01 to 2007-08, Defence reported the preparedness of its capability elements relative to (undisclosed) preparedness targets. The eight years of collected reporting are summarised in Figure 2.6.3 of this brief. Note that after steadily improving from 2000-01 to 2005-06, a slight decline is apparent over the past three years. Nonetheless, the overall result is one of improvement.

Of course, reporting against undisclosed and possible shifting preparedness targets can be misleading—in principle we have no way of telling whether the results reflect improved performance or falling expectations. Nonetheless, the recent and ongoing operational tempo of the ADF clearly demonstrates that preparedness has improved and is being managed in a sustainable way across many areas of the force. In particular, we can be confident that the Special Forces, infantry and cavalry elements of Army (which carry the largest share of the present operational profile) are much better prepared than at any time in at least the past decade.

The situation is much less clear in the other two services and in specific parts of the Army like aviation. In fact, it is clear that preparedness is compromised in a number of areas of the ADF by inadequate equipment and personnel shortages. Take for example the absence of up-to-date electronic warfare self protection on many ADF platforms. Because of delays stretching back more than a decade, many ADF aircraft still lack the protective equipment needed to confidently deploy them other than in benign environments.

Army's Black Hawk helicopters are unable to be sent to Afghanistan because they lack the basic infra-red signature suppression to evade forty-year old shoulder launched missiles, and our F/A-18 Hornet fighters remain vulnerable to surface-to-air missiles that were first fielded in the 1980s. Eight years after *Defence 2000*, fitted-for-but-not-with is alive and well in the defence force.

Space prohibits a complete recounting of the limitations that equipment shortcomings impose on how and where the ADF can be employed. Suffice to say that there are problems across all three services; problems that have long been known but for which remedial action has been painfully slow. The interested reader is referred to the series of four 'ADF capability reviews' authored for ASPI by Andrew Davies in 2008.

The impact of personnel shortages is less easy to assess. It is known that the ADF has had difficulty attracting and retaining people with skilled trades in recent years. This was particularly acute from around 2002 to 2005 when the strength of the permanent ADF declines despite a concerted effort to grow the force in line with the goals of *Defence 2000*. Following an infusion of cash in 2005, the situation turned around and ADF numbers are now growing steadily.

Problems nonetheless remain in many of the support and technical areas of the force and it will take a number of years before the workforce is in a healthy state. The most glaring example of personnel shortages eroding the preparedness of the force is the submarines. Of the six boats, three are in the water and able to deploy, one is undergoing refit and two are lying idle due to an absence of crew.

Thus, although the ADF is maintaining a robust operational tempo (around 5-6% of the force is presently deployed on operations) and many parts of force are much better prepared than at the start of the decade, 'fully developed capability' remains elusive.

Expeditionary capability for the immediate region

Prior to *Defence 2000*, the working assumption was that the ADF would be able to execute whatever off-shore operations it was called on to perform from a force structure developed exclusively for the defence of Australia. In the case of Army, this proved to be a case of wishful thinking. In 1999, East Timor demonstrated that a land force designed for operations in the north of Australia was ill-suited for an expeditionary deployment in our near region. To redress this, *Defence 2000* set about revamping the expeditionary capability of the ADF through a package of measures termed, within government, the 'inner-arc enhancements'.

Here, for once, the news is unambiguously positive. The commissioning of the two LPA vessels, HMAS *Manoora* and *Kanimbla*, at the start of this decade along with various enhancements to deployable land logistics have largely achieved the goal of

an expeditionary land capability tailored for Australia's near region. This has been amply demonstrated in repeated deployments to East Timor and Solomon Islands, as well as through humanitarian relief missions to PNG and Indonesia. That this has been possible concurrent with significant operations in Iraq and Afghanistan, further confirms that the sought expeditionary capability has been delivered.

Sustainable funding

It did not take long for it to become apparent that Defence was struggling to deliver the outcomes sought by *Defence 2000* within the funding provided. In 2003 an internal Defence Capability Review recommended cuts to the force structure to contain costs including the decommissioning of two FFG frigates, the early retirement of the F-111 fleet and the laying up of two mine-hunting vessels. The long-term savings from these initiatives amounted to only around \$152 million per annum.

These cuts failed to bring the books into balance and, as we shall see in the next section, from 2005 onwards additional funds were given to Defence to manage the baseline cost of personnel, estate and logistics. At the same time, savings measures of \$200 million a year were imposed on Defence to redirect money to combat capability.

It is tempting to conclude that *Defence 2000* grossly underestimated the cost of what it sought to achieve. No doubt, a share of Defence's budget woes reflects a failure to properly estimate the funds it needed when it submitted *Defence 2000* to the government. But this is not the whole story. The 2008 Defence Budget Audit concluded that Defence can achieve efficiency savings of around \$2 billion a year. To the extent that this is accurate, it implies that Defence's failure to deliver the goals of *Defence 2000* within the original budget had as much to do with wasteful business practice as anything else.

Conclusion

It has been 8 years and 6 months since the release of *Defence 2000* — 4 months longer than it took the United States to put a man on the moon (July 1969) following Kennedy's announcement in May 1961. And while there have been valuable and encouraging improvement to most areas of ADF capability over that time, progress has been remarkably slow compared with the targets set in December 2000. Even taking into account the ongoing operational tempo of the ADF, the extent that Defence has failed to deliver on its promises over the past eight years is disappointing.

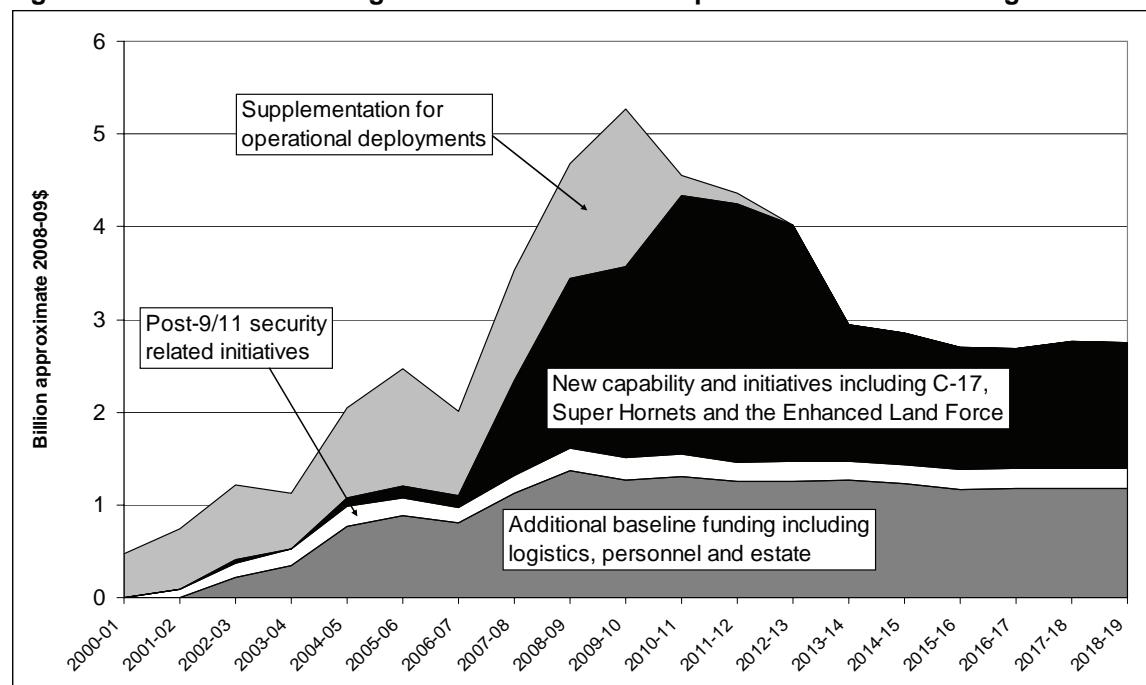
Boom times: 2002-2008

Substantial additional funding was made available to Defence in the years that followed the tabling of *Defence 2000* to meet growing budget pressures. Still further funding was provided for new and expanded capabilities in the aftermath of 9/11 and the deployments that followed.

Because official budget figures are invariably given in 'out-turn' format that anticipates future inflation and foreign exchange rates, it is difficult to give a definitive figure for the value of additional funds provided post-2000. The best we can do is to capture the scale of funding using the historical values that appeared in the budget papers at the time and convert to 2008-09 dollars. While such an approach fails to capture the adjustments due to revised estimates of inflation and foreign exchange, it is the best that can be done with publicly available information. Exclusive of the funding provided in 2006-07 and 2008-09 to extend 3% real growth

in defence spending out to 2017-18, an additional \$27.6 billion in funding has been provided for the present decade (2001-02 to 2010-11). In comparison, *Defence 2000* provided \$30 billion of additional funding over the same period. Looking forward to the next decade, a total of \$52.7 billion in extra funding has been committed for the period 2001-02 to 2018-19. Figure 3.4 graphs the extra funds provided in addition to those from *Defence 2000*.

Figure 3.4: Additional funding since the 2000 White Paper and exclusive of 3% growth



Source: ASPI analysis of budget papers and DAR, CPI inflation used

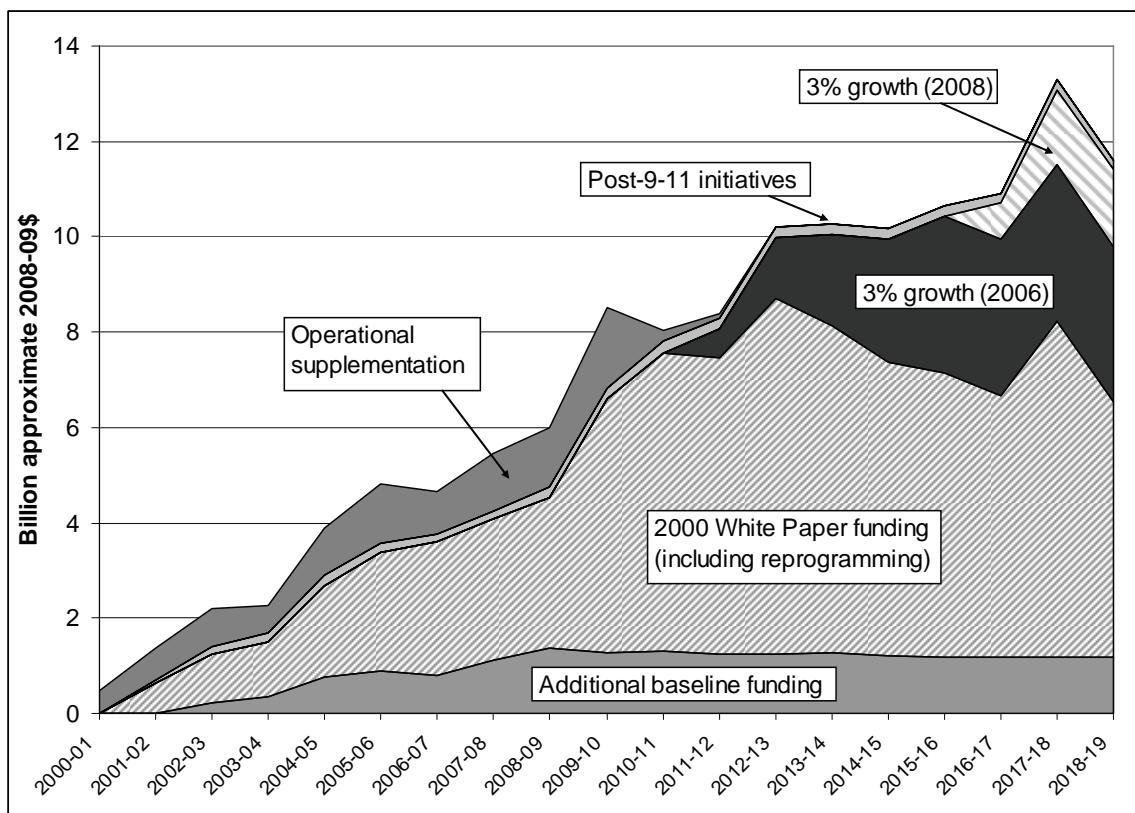
The additional funding is usefully broken into four categories:

- operational supplementation for the net additional cost of ADF deployments (\$6.8 billion in the present decade)
- the addition of capabilities like the C-17 (\$3.2 billion) and F/A-18 Super Hornet (\$6 billion) acquisitions and their associated running costs, the largest of these is the Enhanced Land Force initiative that will add two infantry battalions to the Army at a cost of \$10 billion over a decade
- specific post-9/11 security related initiatives valued at \$1.9 billion over the present decade, including the establishment of a tactical assault group capability on the East Coast
- additional baseline funding to cover the cost of pre-existing capability, including in the areas of logistics (~\$480 million per annum), personnel (~\$610 million per annum) and estate (~\$120 million per annum).

As can be seen in Figure 3.4, the net long-term impact of the additional post-2000 funding of all types is worth around \$2.8 billion to the annual recurrent budget.

Adding together the money provided by *Defence 2000* to that provided subsequently including the extension of 3% supplementation in 2006-07 and 2008-09, we can plot the overall growth of defence funding past and projected; see Figure 3.5.

Figure 3.5: Additional funding including 2000 White Paper and subsequent 3% growth



Source: ASPI analysis of budget papers and DAR, CPI inflation used

At the same time, cuts were made to Defence funding either by removing capability (as in the Defence Capability Review) and taking away funding, or by directing Defence to absorb the cost of new capabilities and tasks. Included in this latter category is the more than \$1.1 billion of measures that Defence absorbed last year following an abnormally large windfall from price supplementation (and the embarrassing hand-back of \$830 million of unspent funds from 2007-08). In addition to these actual cuts to the budget, Defence was periodically asked to find efficiencies. An examination of these efficiency initiatives is deferred to the next section of this brief so that they can be examined in the context of the \$20 billion Strategic Reform Program announced in *Defence 2009*.

Despite all the money flowing into Defence, it remained unclear whether adequate funds were available pre-*Defence 2009* to deliver the capabilities then sought. On the one hand, it looked like not enough money had been set aside to crew and operate the raft of new capabilities under development—hence the \$10 billion savings program announced in early 2008. On the other hand, Defence was unable to spend the money it had for both investment and recurrent spending. This was the state of Defence funding prior to the release of *Defence 2009*.

The 2009 Defence White Paper

On 3 May 2009, the Prime Minister released the long-awaited 2009 Defence White Paper at Garden Island dockyard with a chorus of sailors and a Frigate standing watch in the background.

Entitled *Defending Australia in the Asia Pacific Century: Force 2030* the document includes one and half pages—585 words to be precise—on how the government will fund Defence over the next 21 years. The plan has two parts.

First, a funding model with the following elements:

- ‘3 per cent real growth in the Defence budget to 2017-18’
- ‘2.2 per cent real growth in the Defence budget from 2018-19 to 2030’
- ‘2.5 per cent fixed indexation to the Defence budget from 2009-10 to 2030’
- ‘that Defence will reinvest savings from its [\$20 billion decade-long] Strategic Reform Program back into priority Defence capabilities as agreed by the Government’
- ‘shortfalls against the White Paper funding plan will be offset by Defence’.

Second, ‘Defence [will] undertake a substantial program of reform, efficiencies and savings to underpin the achievement of White Paper objectives. In addition to meeting the broad objectives of the White Paper, these savings will allow Defence to correct long-term hollowness and remediate the enabling functions of the Australian Defence Force’. This is, of course, the \$20 billion Strategic Reform Program.

Taken at face value, the White Paper says that defence funding will increase by 3% over the next decade and 2.2% over the decade that follows. That is, in 21 years time the budget will only be 5.2% higher than today. Of course that’s not what they meant. Clearly the word ‘annual’ had been omitted in front of ‘growth’ in the two operative statements.

Even with this important realisation, there was little joy to be had for anyone looking for concrete numbers. Indeed, the level of financial detail contained in the document lauded as the ‘most comprehensive White Paper of the modern era’ was modest. Not to worry, we were told, wait for the budget when all will be revealed.

Defence funding and the 2009 Budget

How much was revealed depended where you looked. The Ministerial press release entitled ‘Defence Budget Overview’ was the least forthcoming. There were only two useful data points:

- the 3% and 2.2% annual growth rates were given the caveat ‘average’ thereby allowing spending to be delayed into the future
- \$2 billion was cut from the forward estimates and deferred to beyond 2015-16.

Next in level of disclosure came the PBS. It contained everything that the Ministerial press release contained but added a further caveat:

- ‘2.5 per cent fixed indexation from 2009-10 to 2029-30, with the 2.5 per cent to be calculated from 2009-10 *but applied from 2013-14*’ [italics added].

Thus, although Defence had been granted an indexation regime that was (at least temporarily) more generous, no benefit would be felt before 2013-14.

But, if you really wanted to understand what was going on, you had to go to Treasury Budget Paper # 2. Therein it was revealed that:

- ‘The new funding model will apply from 1 July 2009, with increases resulting from this new indexation over the forward estimates being returned from 2016-17 onwards, in line with Defence’s acquisition timetable for *Force 2030*.’
- ‘Defence funding will transition to the new long-term path over 2013-14 and 2014-15. Defence funding will be \$1 billion below the new long-term funding path in 2013-14, and \$500 million lower in 2014-15 as higher funding levels are phased in. These amounts will be added back to the Defence budget from 2016-17 onwards.’

This represented good news and bad news. The good news was that the indexation not funded in the forward estimates would be returned from 2016-17 onwards. The bad news was that a further \$1.5 billion was to be deferred from 2013-14 and 2014-15 to 2016-17 and beyond.

Unfortunately, very little of this is clear in the numbers contained in the PBS. In fact, there are very few numbers regarding the new funding model in the PBS. In the entire document there is only one budget line that relates to it. It shows funds added after the forward estimates, but does not explain what’s included. The best we have is an assurance that \$308 billion has been made available over the decade. Among the things we were not told were:

- what the annual budget will be after the forward estimates period
- how much money has been deferred as a result of shifting indexation
- how much major capital investment has been deferred from 2010-11 and beyond
- how much money has been rolled over into the next decade.

Compared with the 2000 Defence White Paper—or even compared with the annual budget from only a couple of years back—the level of disclosure associated with *Defence 2009* is minimal. For a White Paper that we are told is ‘fully costed and affordable...across the life of the White paper to 2030’, we know the budget for just four years out of 21.

Our best estimate of what’s going on is as follows:

- the new funding model adds in excess of \$10.5 billion over the decade including \$5.3 billion in the first four years
- \$8.8 billion has been deferred within the decade including \$6.8 billion in indexation from the first six years and \$2 billion in savings from the first four years

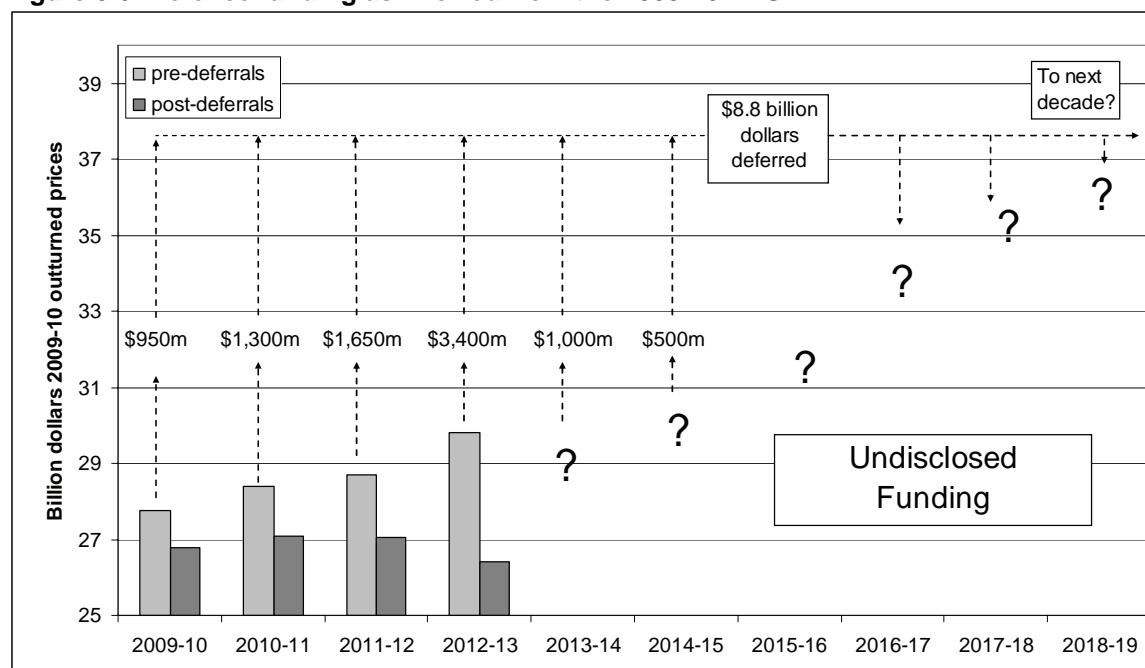
- the eighth, ninth and tenth years receive some deferred funds with the remainder pushed beyond the decade.

Insufficient information is available to reliably estimate how much money goes into the final three years but our very rough estimate is that they receive around \$3 billion in the pattern \$500 million, \$1,000 million and \$1,500 million.

We cannot claim any certainty with any of these estimates. The information is fragmentary, and at several points in the calculation it is necessary to make assumptions about how the budget was put together. But in the absence of public disclosure, it's all we can do. Figure 3.6 shows our best estimate of the flow of deferred funds.

In summary, Defence will receive in excess of \$10.5 billion as the result of a new indexation regime over the next decade. Of these new funds, \$6.8 billion plus \$2 billion of existing funds have been deferred into the last three years of decade and beyond.

Figure 3.6: Defence funding as inferred from the 2009-10 PBS



Source: ASPI analysis of budget papers

With only four years of data, it is impossible to say anything about the rate of growth in defence funding over the decade beyond the assurance given in the new funding model.

The new funding model

There are three interesting facets to the new funding model; the 2.5% fixed indexation regime, the 2.2% real growth trajectory post 2017-18, and the notion that any 'shortfalls against the White Paper funding plan will be offset by Defence'. These are explored below.

Fixed indexation

The purpose of indexation is to maintain the buying power of the budget against changing prices. In the past, Defence has been indexed to the non-farm GDP deflator. This had two undesirable features. First, the non-farm GDP deflator poorly reflected the changing price of inputs to military capability like personnel, equipment and contracted support. Second, it was highly volatile due to its dependence of Australia's terms of trade. A new indexation regime was long overdue.

Ideally, a weighted basket of deflators would have been best; each of the indices reflecting the shifting price of one of the categories of inputs purchased by Defence. This is how the Defence budget used to be managed prior to 2000, and it is the approach used in many long-term commercial contracts. We do not know why the government rejected this sound approach.

Instead, a fixed indexation regime has been adopted based on the middle of the RBA inflation target range of 2.5%. The justification given is that a fixed regime will give Defence planners greater certainty about future funding. This seems to miss the point. Yes, future funding will now be certain, but because prices will remain uncertain so too will purchasing power. What the new approach seems to miss is that the purpose of indexation is to give Defence planners certainty about the purchasing power of the Defence budget, not the number of dollars (of unknown real value) it will have.

Moreover, if CPI inflation is deemed to be a reasonable proxy for the changing cost of the inputs consumed by Defence, why not index the budget to the CPI? Then, if there is an extended period of abnormally high inflation or deflation, the budget would be automatically adjusted accordingly. Higher than target inflation cannot be discounted; over the past decade the CPI has averaged 3% and over the past two decades 3.2%.

So has Defence been disadvantaged by the new regime? That depends on how they have built their internal budget. Provided they have allowed for the predictable above-2.5% growth in the various components of their budget (like personnel costs which outpace inflation by around 2%, and equipment costs that do so by around 4%) they should be okay assuming the Reserve Bank target is met. As we have seen already, Defence appear to have made some optimistic assumptions about their ability to contain personnel costs over the next few years (see Section 2.5). We have no way of knowing more generally.

2.2% real growth post 2017-18

Previous ASPI analysis of the underlying cost of maintaining defence (see Thomson and Davies, *Strategic Choices: Defending Australia in the 21st Century*) estimate that to 'tread water' in terms of size and scope of capability while maintaining an inventory of modern equipment requires average annual growth above inflation of around 2.6%. This also accords with the long-term post-WW II trend in Australian defence funding (see Section 5 of this brief). Thus, it seems doubtful that the funding promised post 2017-18 will be enough to maintain the ADF let alone expand its maritime forces as planned.

But given that we are talking about the decade after next, it is not worth getting too excited—there will be ample opportunity for adjustments to be made in the meantime.

'shortfalls...will be offset by Defence'

Any shortfalls against the White Paper funding plan will be offset by Defence. This sort of statement sounds great in a press release. At last; a government that is willing to draw the line with Defence. But there are limits to this as a practical strategy.

No matter how much it might want to, the government cannot transfer risk to the Department of Defence. The risk of failure to deliver by Defence—in terms of capability or efficiency—is unavoidably borne by the taxpayer. Either we will be less well defended or we will pay more money. You cannot ‘punish’ the defence force by withholding planned capability if it becomes unaffordable. Military capability is for the nation’s defence.

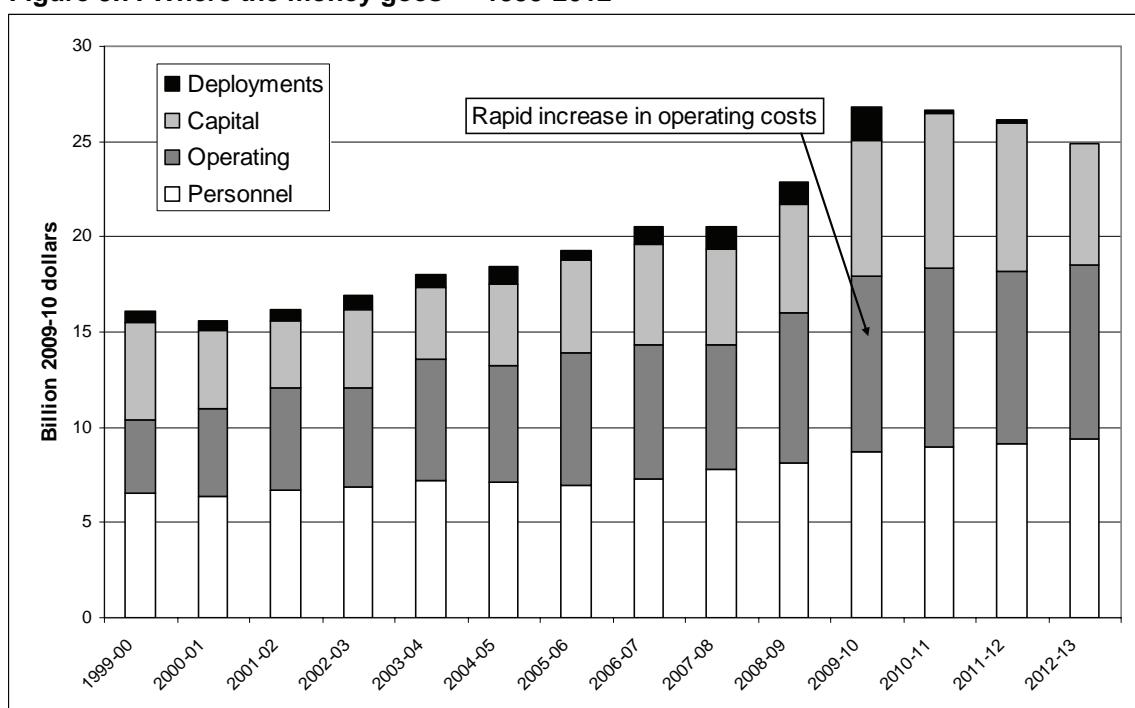
The Department of Defence is not a public corporation that can be held to account. It is a department of state under the Westminster system for which the Minister is accountable. Nothing can change this.

Will there be enough money?

In one sense the answer is trivially yes. Because *Defence 2009* fails to provide any concrete milestones for when things will be delivered over the next decade, the available funds can be spent at a leisurely pace and we will be none the wiser. With no tangible targets to be met prior to 2030, the question of having enough money is hypothetical.

What we can do, however, is to look at the near-term and recent past to see if there are any potentially uncomfortable changes ahead. (If the data were available, this would be a valuable exercise over the entire 21 years of the White Paper.) Our best estimate of how the budget will evolve over the next four years appears in Figure 3.7. We have assumed that operational supplementation is apportioned 10% to capital, 20% to personnel and the residual spent on general operating costs.

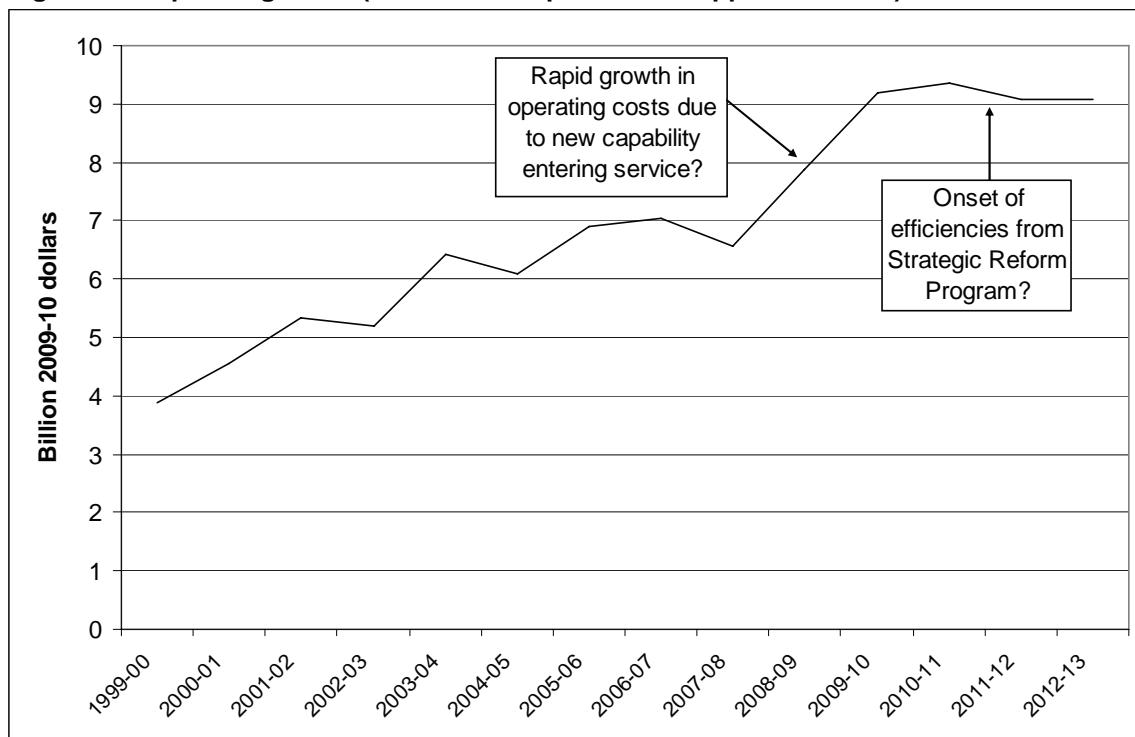
Figure 3.7: Where the money goes — 1999-2012



Source: ASPI analysis of budget papers, CPI deflator used throughout.

Overall, the trends in Figure 3.7 are unexceptional except perhaps for the rapid increase in operating costs in 2009-10, see Figure 3.8. This may reflect the several new capabilities that are promised to enter service next financial year. Note that operating costs are contained in the years that follow, presumably a reflection of the onset of savings due to the Strategic Reform Program.

Figure 3.8: Operating costs (exclusive of operational supplementation)



Source: ASPI analysis of budget papers, CPI deflator used throughout.

SECTION 4 – STRATEGIC REFORM PROGRAM

A central component of the 2009 White Paper is the Strategic Reform Program (SRP). The SRP is a comprehensive package of reforms and efficiency initiatives to improve Defence's performance and deliver \$20 billion of savings over the next decade. This section examines the SRP and other planned changes to Defence management.

The appearance of yet another Defence reform program comes as no surprise. Over the past forty years, repeated attempts have been made to reorganise, restructure or otherwise fix the way Defence goes about its business. It usually takes four or five years before dissatisfaction emerges and the cycle begins anew. In this instance, it is only two years since the Defence Management Review ushered in the most recent package of changes.

It would be a mistake, however, to view the SRP as just another routine shuffling of the deck chairs. While it's not as complex as the 1997 Defence Reform Program, the SRP is a serious undertaking with an ambitious savings target. The SRP was developed within Defence and brings together;

- initial work undertaken within Defence to find \$10 billion of savings following the government's direction to do so in early 2008
- analysis undertaken in the series of Companion Reviews commissioned within Defence in 2008 that examined the Defence workforce, capability planning, facilities and estate, information technology, logistics, defence industry, and science and technology
- recommendations by the Independent Defence Budget Audit undertaken by Mr George Pappas with assistance from the McKinsey and Company consulting firm in 2008.

Consistent with the scale of the reform program, the SRP will be overseen by an independent Defence Strategic Reform Advisory Board 'to provide advice to the Government on how the strategic reforms within Defence should be implemented, and to assist in ensuring the savings programs are delivering the results that are expected'. The board will include the Secretary and the Chief of the Defence Force as well as the CEO of the Defence Materiel Organisation and the Secretaries of Finance, Treasury and the Department of Prime Minister and Cabinet. The board will subsume the role of the former Defence Procurement Advisory Board.

What follows is divided into two parts. The first deals with planned changes to the Defence's management; the second explores defence efficiency and the proposed \$20 billion savings program.

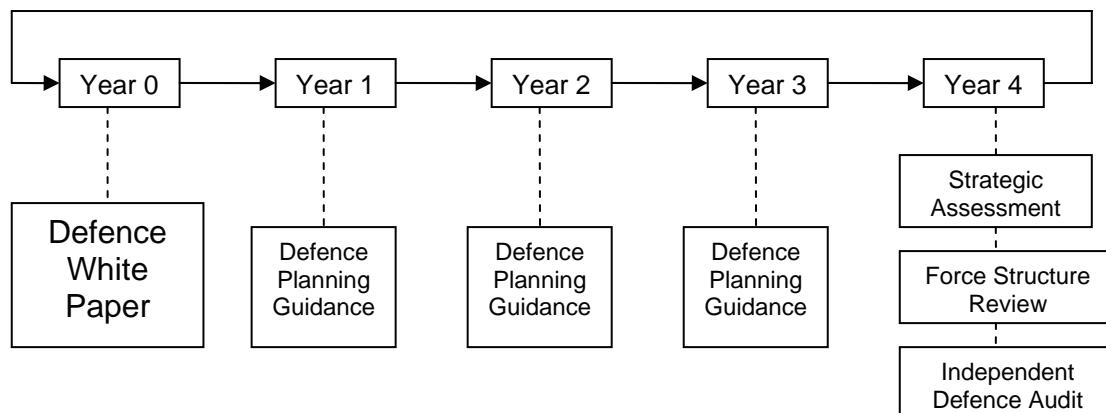
Defence Management

A five-year Defence planning cycle

Defence management begins with the plans that the government endorses for the organisation. To ensure that the government's plans for defence evolve to meet

changes in the strategic environment, a five-year planning cycle has been introduced as depicted in Figure 4.1.

Figure 4.1 The new five year strategic planning cycle



In the three years following a White Paper, Defence will produce a classified Defence Planning Guidance (DPG) document that looks 3-5 years into the future so that plans can be adjusted to take account of changing circumstances. In the fourth year, a Strategic Assessment, Force Structure Review and Independent Defence Budget Audit will be undertaken preparatory to a White Paper in the fifth year.

In the future, no new force structure option will be considered unless it has been generated through this process—either through a DPG or as a result of the periodic Force Structure Review. To support the new approach, some of the processes and techniques developed for this year’s White Paper will become permanent features of how Defence goes about analysing and planning capability. In addition, the government has said that it will more closely oversee the capability development process than in the past.

While the commitment to a five year planning cycle is to be commended, it will be difficult to achieve in practice. If nothing else, the superposition of the federal electoral cycle will inevitably disrupt the process at unforeseeable times.

A new Defence business model

Defence is a sprawling conglomerate of the three military services and a host of civilian agencies that provide support and administrative services. One of the long-standing problems has been that those nominally responsible for delivering capability only control a small part of the resources necessary to do so. Instead, services like base support, personnel administration, logistics and information technology are provided to them as essentially ‘free goods’ by common providers.

While this collective service delivery approach generates economies of scale, it unavoidably clouds accountability and prevents capability managers (essentially the Service Chiefs) from managing the full range of inputs to the capability they are nominally responsible for. ASPI has long argued that the capability managers need to be given much closer control so that they can drive performance. See for example, *Improving Defence Management* published in 2007 which recommended:

As a long-term goal, make the Service Chiefs responsible for the cost-effective delivery of military capability and able to make the decisions inherent in exercising that responsibility. Like any other managers, they should be personally accountable through incentives and sanctions for the results they achieve.

It was heartening, therefore, to see the White Paper announce a new management model that will provide ‘senior leaders with greater authority to manage their budgets and non-financial inputs’ While details of the new ‘outputs-driven budget management model’ are scarce, we understand that funding will be directly allocated to capability managers under the new model.

Unfortunately, the new scheme was not ready for introduction in this budget so we will have to wait and see how much accountability and control of resources actually occurs. It remains to be seen whether Defence is finally going to move away from the Soviet-style central planning model introduced by the 1997 Defence Reform Program.

Other management initiatives

The White Paper includes a number of other initiatives arising from the Companion Reviews and Independent Defence Budget Audit. These include improvements to the management of defence force preparedness, improved estate planning, better estimation and management of costs, and streamlined service delivery in several areas including information technology. Some of these initiatives are examined more closely below in the context of defence efficiency.

The Mortimer Review of defence procurement

While not strictly part of the SRP, the 2008 follow-on to the 2003 Kinnaird Review of defence procurement is an important element of how Defence and DMO will move ahead. Undertaken by Mr David Mortimer, the review examined the force development and acquisition process from start to finish and made 46 separate recommendations. Of these, the government has accepted 42 in full, agreed with three in part and rejected only one (the proposal to re-establish DMO as a more independent executive agency).

It is beyond our scope to list, let alone to discuss, each and every one of the recommendations. Instead, we will briefly sketch out the key initiatives from the 20-point plan that was directed in the government’s response to the Review. These are:

- The head of DMO will have a strengthened role at the National Security Committee (NSC) of Cabinet by advising on the cost, risk, schedule and acquisition strategy for major capability proposals.
- Greater flexibility will be extended to the head of DMO to more flexibly manage the DMO workforce including through more attractive remuneration.
- Another deputy-secretary level position ‘General Manager – Commercial’ will be created in DMO to support the development of a more commercially orientated culture in the organisation.

- The Service Chiefs and other capability managers will be given a strengthened role in the acquisition process.
- A lifting of the thresholds for NSC consideration of acquisition proposals from \$50 million to \$100 million.

These and the other initiatives have the potential to continue the progress already made since the establishment of DMO in 2003. Nonetheless, the inherent complexity of defence projects means that risks will remain—especially with some of the Australian-unique solutions outlined in the 2009 White Paper. No one should be under any illusion that challenges and problems can be avoided in what lies ahead.

Defence Efficiency

Efficiency refers to the quantity of output delivered per dollar spent. For Defence, the output is principally military capability. The all too-frequent cry that Defence should focus on effectiveness, rather than efficiency, is wrong-headed. For a given budget, greater efficiency delivers greater output and therefore greater military capability and effectiveness. And this is precisely the circumstance that Defence is faced with today—the government has said that efficiency must be improved to fund budget shortfalls, remediation, and new capability initiatives.

Just as it is important not to see efficiency and effectiveness as incompatible, it is equally important not to confuse efficiency and savings through reduced output. It is always possible to save money by, for example, delaying equipment procurement or reducing preparedness, but these sorts of actions reduce the amount of capability delivered as much as they reduce costs—hence effectiveness falls and, all other things being equal, efficiency stays where it was.

What follows is divided into three parts. First, the broad question of Australian defence efficiency is briefly examined. Second, we survey previous attempts to make Defence more efficient and ask how effective they have been. Finally, we look at what we know about the \$20 billion savings program announced in the 2009 White Paper.

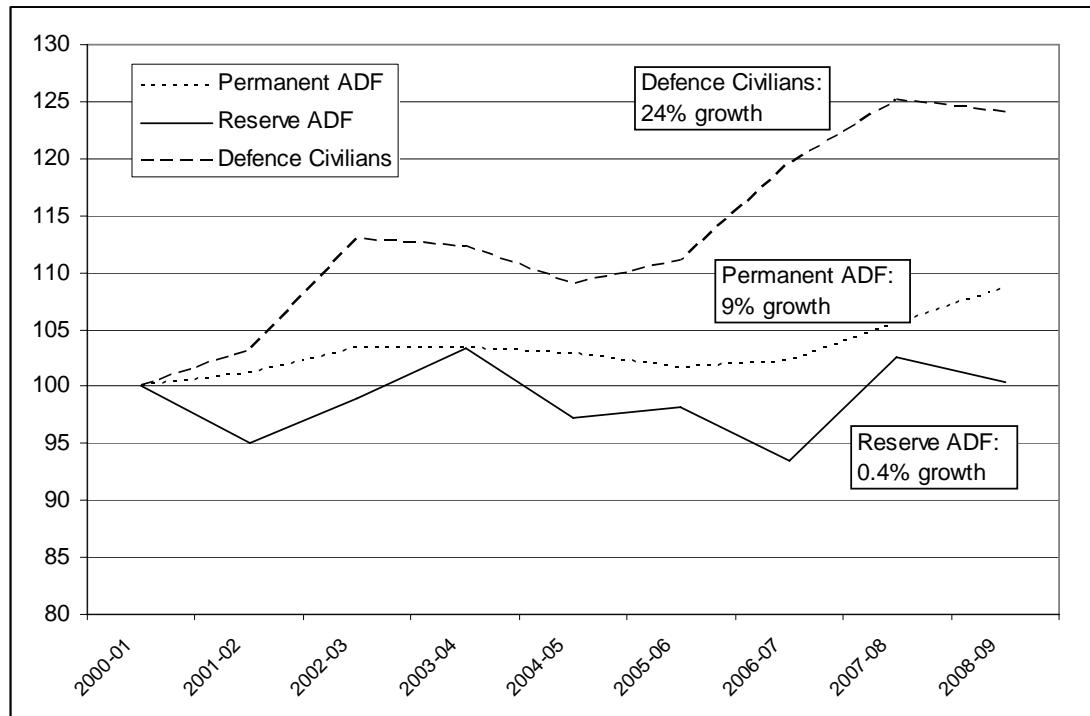
Doing more and paying more

In last year's budget brief we looked closely at trends in Defence's costs and outputs and concluded that there was at least *prima facie* evidence that it was less efficient than it could be. What makes such a judgment difficult is that although defence costs have been increasing rapidly, there has also been an improvement in defence output over the same period. Rather than reproduce what we said last year, just a couple of observations on the matter are offered below.

In terms of permanent uniformed personnel, the gains of the past eight years have been modest, see Figure 4.2. (Rather than count our chickens before they hatch, we will only look at the period ending with 2008-09.) Despite a concerted effort to grow the force, only around 5,000 additional full-time uniformed personnel (representing a gain of 9%) have been added to the ADF. In contrast, since 2000 the number of full-time civilians has grown by 3,913 positions, representing an increase of 24%.

Over the same period, the number of part-time Reserve personnel has grown by 80 positions (0.4%).

Figure 4.2: Growth in personnel numbers 2000-01 to 2008-09 (2000-01 = 100)



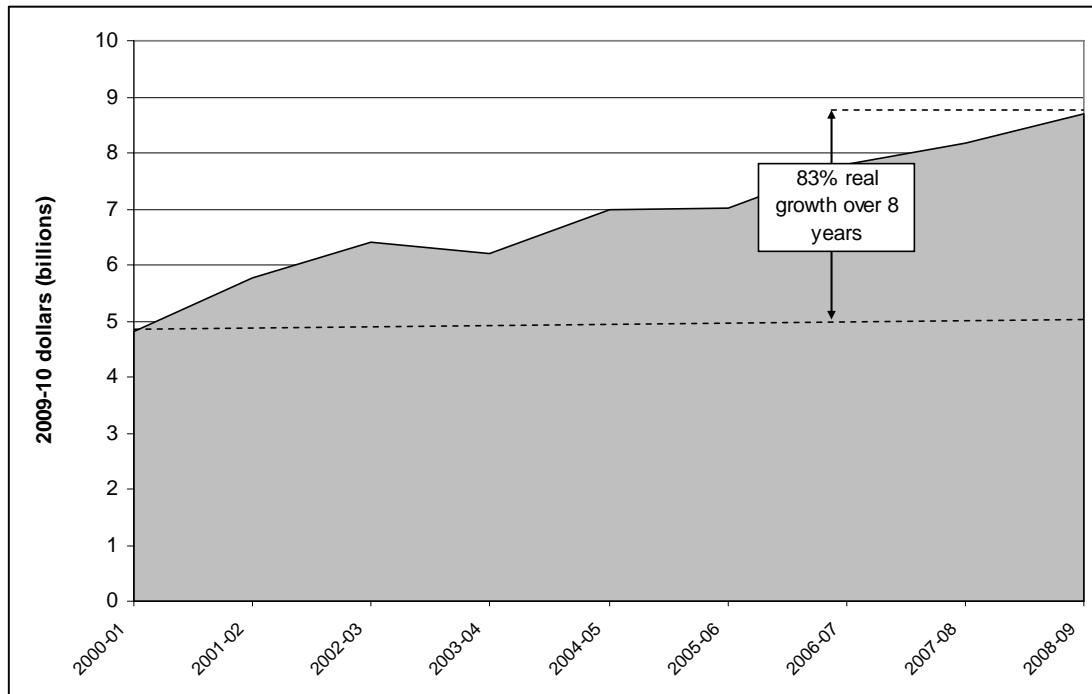
Source: Defence Annual Reports and Budget Papers, 2008-09 PAES

The extent to which these figures represent increased capability is hard to gauge; both civilian and uniformed personnel can be used either efficiently or inefficiently. Let us optimistically assume that the increased size of the permanent military force is a reasonable surrogate of additional capability. This implies that capability has only grown by 9% in the past eight years. Thus, to the extent that raw personnel numbers represent capability, the gains since 2000-01 have been modest.

Broadly speaking, personnel expenses have increased in line with personnel numbers and the well understood above-inflation trend. In particular, and as explained in Section 2.5, the per-capita cost of uniformed personnel has been contained within the ‘inflation + 2.5%’ margin that Defence planned for. In this sense, we are paying no more per military head than is reasonable. For civilians, however, the rate of per capita increase is faster than supplementation, probably reflecting substantial level enrichment within the civilian workforce.

Over the past eight years, suppliers costs (effectively cash spent on anything other than personnel and investment) have grown by 83% as shown in Figure 4.3. What makes this interesting is that the rate of growth is much faster than that of personnel numbers. The cost of the force has been growing much more quickly than the size of the force. Of course, such a disparity could be accounted for by the increasing cost of operating new and more expensive equipment.

Figure 4.3: Real suppliers expenses 2000-01 to 2008-09



Source: Defence Annual Reports and Budget Papers, 2008-09 PAES.

A crude but interesting estimate of the rising cost of capability can be constructed by assuming that permanent military numbers are a rough proxy for military capability and calculating the ratio:

$$\text{Cost per permanent member} = \frac{\text{Suppliers} + \text{Personnel expenses}}{\text{Number of permanent military personnel}}$$

Over the past eight years, the cost per permanent military member has grown by 5.2% per annum above inflation. As a result, we are now paying 42% more in real terms for each permanent uniformed member when all other (non-investment) costs are included. While this is not a proof of inefficiency, it is far from reassuring.

The long drive for efficiency

To put the present goal of freeing up \$20 billion over the next decade in context, it's worth recalling how we got to where we are today.

Serious efforts to improve efficiency within Defence began with the 1990 report by Alan Wrigley entitled *The Defence Force and the Community*. It laid out a scheme whereby support roles traditionally performed in-house by Defence personnel (uniformed and civilian) would be transferred to the private sector. Through the 1990s, and in tandem with the sale of government-owned naval shipyards, aircraft factories and munitions plants, activities in Defence that were deemed unnecessary to retain 'in uniform', and which could be delivered more efficiently by the private sector, were outsourced.

Until the latter part of the 1990s, the outsourcing occurred under the auspices of the *Commercial Support Program* (CSP) which systematically applied cost-benefit analysis to activities. The original goal of the Program was to accrue \$200 million in recurrent savings by 1998 from within a Defence budget of around \$8 billion per year. As a result of the CSP and direct cuts to the force structure made in the 1991 *Force Structure Review* (which removed more than 6,570 positions from the permanent ADF) the size of the full-time uniformed force fell from 68,700 to 57,000 between 1990 and 1997. Over the same period civilian numbers fell from 24,000 to 18,000.

When the new government arrived in 1996, Defence was initially quarantined from the widespread cuts to the Public Service that occurred. Apart from a \$125 million administrative savings measure which was redirected to military capability, it was untouched. But in October of that year, the government commissioned an external *Defence Efficiency Review* to look for ways to improve efficiency. As with the present initiative, the aim was not to take money from Defence but to redirect funds to the sharp end.

There was good reason to do so; the CSP had been delivering savings much more slowly than cost pressures emerged. As a result, a growing gap between means and ends was having an increasingly deleterious effect on the preparedness of the ADF and the state of its equipment. In retrospect, this is hardly surprising given that the Defence budget was effectively held constant in real terms over the period at the same time as the cost of personnel, equipment and support comfortably outpaced inflation.

The *Defence Efficiency Review* led to the *Defence Reform Program* (DRP). The DRP was nothing if not ambitious. From an annual Defence budget of around \$10 billion, the DRP sought to generate \$941 million in recurrent savings and \$675 million in one-off savings—all without any reduction in military capability. In comparison, prior to the DRP the CSP had only delivered \$155 million in savings.

To free up what amounted to almost 10% of the Defence budget, the DRP proposed:

- accelerating and deepening the contracting-out of activities to the private sector
- consolidating duplicated administrative and support activities
- reducing the Defence property portfolio through consolidation and sale of surplus assets.

In consequence, a total of 12,201 military and 8,303 civilian positions were to be removed through efficiency measures or examined for market testing.

Of course, planning to save money and actually doing so are different things. And, while the sale of properties did eventually deliver \$1.5 billion in one-off savings, it is frustratingly difficult to judge the extent to which the DRP achieved its goals for recurrent savings. There are two reasons for this.

First, Defence made few attempts to monitor individual initiatives and measure the near-term, let alone long-term, impact on the cost of delivering capability or the quanta of capability delivered. As a general comment, Defence's coordination of the program was poor and reporting was lax. In many cases, efficiencies were deemed to

have occurred by simply reducing sub-organisational budgets. Given that significant budget pressures re-emerged well before the end of the decade, it is likely that a good share of claimed efficiencies were an illusion. And, in any case, the claimed efficiencies fell well below target. According to a 2001-02 Audit Office Report, of the \$941 million of planned savings only \$644 million was claimed as achieved or *in progress* as of 2001. No subsequent accounting or reporting of overall results occurred.

Second, rather than redirect the savings to meet shortfalls in capital investment or logistics, the decision was taken to use the savings to 'buy back' ADF personnel and increase the planned long-term (post-DRP) strength of the permanent force from around 45,000 to 50,000. In theory, this meant continuing to outsource non-core military positions and re-employing those personnel to deliver additional combat capability. However, despite the claim that additional capability resulted from the 'buy-back', no new battalions were raised, not a single additional vessel set to sea and no extra aircraft took to the air.

Whether the DRP delivered efficiency in the long-term is hard to say. Despite a singular fixation with financial accounting (at great cost and no tangible benefit), Defence has proven itself to be largely indifferent to understanding or planning its business. It may be that in some cases the DRP simply transferred activities from inefficient public hands to monopoly rent-seekers in the private sector. This risk is particularly high where services are so Defence-specific that set-up costs restrict the entry of new suppliers after initial contract award. Moreover, it may be that the initial justification for some outsourcing was skewed by the one-off availability of already trained ex-Defence personnel—resulting in rising costs once suppliers had to take on the burden of training personnel.

In any case, the overall perception of the DRP among Defence personnel—particularly military personnel—is negative. Defence folklore holds that the DRP cut costs by reducing the quality and responsiveness of services while at the same time undermining the sustainability of military career paths in many areas. It is unlikely that these perceptions are without some justification. The only way to tell would be to compare the cost and output of individual activities from 1996 through to the present. As a general rule, Defence has not bothered to collect the data to allow such a comparison.

Beyond the opacity and confusion of the DRP, the next milestone in the drive for efficiency was the 2000 White Paper, *Defence 2000*. In what was a serious attempt to baseline the cost of delivering military capability, *Defence 2000* set out what was believed to be a fully funded ten-year program for the ADF.

Apart from specific additional funds to acquire, man and operate planned new equipment, it injected approximately an extra \$450 million in baseline costs from 2001-02 onwards (through the retention of 1999 'force generation' funds) plus \$150 million in baseline operating costs from 2004-05 onwards. In addition, Defence was directed to find efficiency savings as part of the White Paper funding strategy to 'free up funds to offset unavoidable cost pressures'. Although the 2007-08 DAR says that these funds were returned to the government, they were retained by Defence as planned.

As it turned out, *Defence 2000* failed to properly anticipate—by an appreciable margin—the full cost of developing and maintaining the capabilities it planned for the ADF (in part due to *ab initio* underestimation and at least in equal measure due to escalating capability goals). So, from 2003-04 onward, Defence received a series of additional funding injections to cover rising baseline costs in personnel, logistics and estate. The nature and timing of this additional funding is explored in Section 3 of this brief.

Curiously, at the same time as additional funds flowed into Defence, a series of new efficiency and savings programs were imposed on the organisation. These initiatives fall into several categories as set out below.

Initiatives that remove capability and funding

As a result of the 2003 Defence Capability Review, a wedge of funds was removed from Defence and returned to the government following the early retirement of two FFG frigates and the planned early retirement of the F-111 fleet in 2010. This year, the savings amounts to \$99 million and will grow to \$153 million next year, see Table 4.1. It is important not to confuse these savings with efficiencies. Defence will consume less money but will also deliver less capability as a result of these cuts.

Table 4.1: The 2003 Defence Capability Review

\$m	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11
2003 Defence Capability Review					80	74	85	76	99	153

Source: 2007-08 DAR.

Initiatives that remove funding but not capability

Every now and again a line appears in the PBS slicing money off the budget in the name of efficiency—usually without any real explanation. The first four rows of Table 4.2 fall into this category. How, or whether, these efficiencies are achieved is unknown.

In a somewhat different category is the Rationalisation of ADF Command and Control. This is a genuine efficiency dividend; same output, less input. Defence undertook a review of its network of headquarters and found that they could get by with 241 fewer personnel. Credit is due for this self-generated efficiency.

Table 4.2: Cuts to the Defence budget

\$m	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11
Extra Administrative Savings						70	60	12		
Progressive Efficiency Dividend ¹					3	16	36	59	85	109
Absorbed Budget Measures 2005-06					65	78	46	28		
2007-08 Efficiency Dividends							11	51	57	58
Rationalisation of Command/Control						6	13	21	31	31
Total					68	170	166	171	173	198

¹After 2009-10 the efficiency dividend will continue to grow by roughly \$30 million per annum.

Initiatives that move money around within Defence—‘internal efficiencies’

In these sorts of initiatives, the budget is unaffected but funds are liberated by improved efficiency and redirected to military capability or other priorities. Usually, this entails cutting administrative costs. The presumption being that the administrative or other functions are now performed more efficiently. Table 4.3 lists the two recent examples of this sort of ‘internal efficiency’.

Table 4.3: Internal efficiencies

\$m	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11
2000 White Paper savings initiatives	50	200	200	200	200	200	200	200	200	200
Administrative Savings Initiatives ¹			50 (61)	100 (126)	150 (169)	153 (175)	200 (202)	200	200	200

Achieved administrative savings are shown in brackets

Source: various DAR and Budget Papers

In the case of the *White Paper savings initiatives*, the money was mainly recovered by ‘rebaselining’ the individual internal group budgets in one hit. Where the impact was felt, or how the savings were achieved, remains unclear.

The PBS and DAR no longer report on the *Administrative Savings Initiatives*. For 2007-08 the PBS listed 28 separate initiatives that have or will deliver savings as part of the administrative savings program. It showed Defence actually doing better than required, with an excess of \$39 million at that point. Unfortunately, we cannot put the administrative savings measures in context because we lack a detailed breakdown of how Defence spends its money. Defence ceased disclosing actual expenses by item in the 2006-07 Annual Report. It is impossible to check for reduced spending in an area in the absence of a baseline figure. Given the mounting cost pressures in the Defence budget over the period when these efficiencies were supposed to have been delivered, we have no way of knowing whether any real productivity gains occurred.

Initiatives that add capability but not money

Defence is sometimes asked to absorb the cost of a new measure. Assuming that the new measure is delivered and Defence does not cut capability elsewhere, this represents improved efficiency. Last year, for example, Defence had to absorb around \$1 billion of deployment costs (though this came after a windfall gain in indexation and a hand-back of around \$850 million of unspent money from the previous year). This year, Defence has been told to absorb \$584 million of new initiatives over four years. We do not know if these are included in the \$20 billion savings program or in addition to it.

To conclude our survey of efficiency in Defence, Table 4.4 brings together the various post-1990 efficiency measures (in 2008-09 dollars) and compares them with the planned \$20 billion initiative.

Because most of the savings claimed for the period 1990 to 2000 came about through large-scale consolidation and outsourcing of Defence activities, they represent one-time opportunities that cannot be repeated. With this in mind, the \$20 billion efficiency target looks to be a sizable challenge; it asks for savings more than three times as large as that claimed over the past eight years.

Table 4.4: Efficiency programs 1990-present

Period	Program	Mechanism	Claimed annual savings (\$m)	Approximate percentage of the Defence Budget at that time
1990-1997	Commercial Support Program	Outsourcing	155	1.6%
1997	Administrative Savings Program	Administrative	125	1.3%
1997-2000*	Defence Reform Program	Outsourcing, structural change and administrative	644	6.7%
2000-2008**	Post-2000 Efficiencies	Mainly administrative	598	2.5%
		Total	-	12.1%
2009-onwards	\$20 billion savings	Strategic Reform Program***	1,826	6.9%
		Cumulative total	-	18.7%

*Actually DRP savings trickled on past 2000. **Table 4.2 and 4.3. ***adjusted for out-turning.

So how much fiscal fat did Defence put on during the post-2000 period of generous funding? Although there have been \$598 million per year in claimed efficiencies since 2000, only \$198 million actually came off the budget bottom line, while at the same time around \$1.2 billion of additional annual baseline funding was granted. With so much money flowing into Defence, the danger is that successive efficiency measures do little more than feed off accumulating administrative overheads and inefficiencies.

The Strategic Reform Program

In what follows, we try to explain how the Strategic Reform Program (SRP) plans to free up \$20 billion of savings. Unfortunately, the scarcity of information about the SRP makes it difficult to be precise about what is going to happen.

Before commencing and at the risk of stating the obvious; to free up \$20 billion from within the Defence budget, simple arithmetic demands some combination of;

- reduced personnel expenses
- reduced purchases of goods and services.

Assuming that the savings will not involve cuts to capital investment, they need to be found from within the \$8.8 billion annual personnel budget or the \$9.3 billion suppliers budget. In terms of personnel, to save a billion dollars from the annual budget requires removing 10,000 civilians or 7,800 military personnel based on present per-capita rates. To save a billion dollars in suppliers expenses requires buying a billion dollars less of goods and services.

In what follows we have collected what we can from the public domain regarding the SRP including media releases, budget papers and the 2009 Defence White Paper itself. Compared with the 570 page report that preceded the Commercial Support Program (The Defence Force and Community, 1990) and the close to 500 pages that preceded the Defence Reform Program (Future Directions for the Management of Australia's Defence, 1997), the level of disclosure surrounding the SRP is surprisingly slight.

Just how much money will be saved?

Table 4.5 collects together all the useful dollar figures that we could find in the public domain regarding how the SRP will save money. Although the savings categories are sometimes labelled differently, they appear to be roughly consistent. Net savings of \$3.5 and \$18.2 billion will be made over the next four and ten years respectively.

Table 4.5: The Strategic Reform Program savings

	The next four years: 2009-10 to 2012-13 (\$m)	The next decade: 2009-10 to 2018-19 (\$m)
What the Department said:		
Shared services	?	1,400
Workforce reform	?	1,900
Non-equipment procurement	?	4,400
Smart maintenance	?	4,400
Inventory management	?	700
Information technology (IT)	?	1,900
Unspecified	?	5,900
Total	5,000	20,600
Net savings		18,000 – 19,000
What the Minister said:		
Military support functions	1,500	5,500
Enterprise support functions including IT	500	3,500
Workforce reform	500	2,000
Non-equipment procurement	1,000	4,500
Other including major equipment procurement	1,500	5,000
Total	5,000	20,500
What the Budget said:		
Gross savings	4,967	20,682
Cost of savings	-1,463	-2,444
Net savings	3,503	18,238

Source: 2009-10 PBS, Ministerial media release 13 May 2009 and Media Transcript 7 May 2009.

The quoted savings—net or gross—are inflated by the out-turning of the Defence budget by 2.5% per annum under the new funding model. To make the scale of the savings tangible, we have calculated the average annual saving in terms of 2009-10 dollars and expressed this as a share of the present budget from which the savings are going to be taken. The results appear in Table 4.6 where we have taken the opportunity to group related initiatives.

Because the Defence budget is rising in real terms, the percentages calculated overstate the actual impact of the savings program. In the absence of greater disclosure about the SRP, this is the best that we can do.

Table 4.6: The Strategic Reform Program savings – annual impact in present terms

Area	10 year savings (\$m)	Annual effective savings (\$m)	Approximate present spending	Percentage of present spending
Non-military support				
shared services	1,400	125	?	?
non-equipment procurement	4,400	393	?	?
subtotal	5,800	518	5,000	10.4%
Military support				
inventory management	700	63	1,369	4.6%
smart maintenance	4,400	393	4,105	9.6%
subtotal	5,100	456	5,474	8.3%
Other areas				
workforce reform	1,900	155	8,800	1.8%
information technology	1,900	170	?	?
Other including MCE	5,900	527	?	?
Total	20,600	1,826	26,700	6.9%

Source: ASPI analysis of various public sources

To put some meat on the bones of the various savings categories we have collected up what we can from the available public sources which are the 2009-10 PBS, Ministerial media releases of 12 and 13 May, a Defence media briefing from the 7 May, a speech by the Secretary of the Department of Defence from the 5 May and the 2009 Defence White Paper.

Non-military support

Shares services (\$1.4 billion over 10 years)

Shared services include payroll, human resource management and financial services. It is anticipated that standardisation and centralisation of shared services will result in some workforce reductions.

No doubt new information technology systems will also be necessary to support the new more-efficient delivery of these shared services. It is noteworthy that the present shared service arrangements and systems were established in the wake of the Defence Reform Program with the intent of saving money through consolidation and improved technology.

To save \$1.4 billion over the decade is equivalent to a \$125 million saving from the present budget once out-turning is taken into account. We do not know how much is spent in these areas so we cannot put the proposed savings in any context.

Non-equipment procurement (\$4.4 billion over the decade)

This includes 23 categories of support services including training, travel, catering and business. Reforms in this area include:

- ‘commercially savvy procurement and negotiation of contracts to deliver real value for money’
- establishing a ‘centre of procurement and contracting excellence’ in the Defence Support Group
- greater use of videoconferencing networks rather than single-day travel.

Examples of the sorts of changes that are going to be explored are: integrating other rank and officer messes; integrating single Service facilities with joint ones, and further standardisation of hospitality, catering, cleaning and access control services.

Shared services and non-equipment procurement together cost \$5 billion a year. The proposed savings of \$5.8 billion over the decade represent savings of around \$518 million out of the present budget (taking out-turning into account) or 10.4% of present expenditure.

Military support

Inventory management (\$700 million over 10 years)

By now everyone knows the story of the 286,500 wasted paper hand towels. (Why they were wasted is unclear, do hand towels have a use-by-date?) In any case, the idea here is that stock holding can be reduced and money saved by only purchasing what is needed. Or to put it another way, it is estimated that around \$700 million of unnecessary inventory will accumulate in warehouses over the next decade unless steps are taken to prevent it.

With around \$1.4 billion a year spent on inventory, the \$63 million annual saving (out-turning taken into account) represents a 4.6% reduction.

Smart maintenance (\$4.4 billion over the decade)

The maintenance of military equipment presently costs around \$4.1 billion a year (exclusive of inventory). As a result of the outsourcing last decade, much of the maintenance is done under contract by the private sector. Savings will be sought by having DMO, the Services and Industry work together to find more cost-effective ways to maintain the 100 or more asset fleets owned by the defence force.

Because many existing contracts are long-term, this will take time. Nonetheless, the PBS says that the savings are anticipated to reach in excess of \$400 million per year within four years and over \$500 million per year within the decade.

The planned annual savings of \$393 million (out-turning adjusted) represent 9.6% of present expenditure on military equipment maintenance.

Non-military support

Workforce reforms (\$1.9 billion over 10 years)

We are told that the combined impact of the Defence White Paper and the SRP will be to increase military personnel numbers by 3,000 to 57,800 and civilian numbers, including contractors, by 300 to 21,900. However, this would appear to overstate the increase in military numbers and understates that for civilians. Given that there are presently 55,118 military and 20,720 civilians (including Professional Service Providers); at best military numbers can grow by 2,682 while civilian numbers must grow by 1,180. These discrepancies do not instill confidence.

In any case, workforce reform has to save \$1.9 billion over the decade in tandem with these rising numbers. The White Paper describes a 'largely civilianised and professionalised non-deployable military workforce' (how a workforce can be both civilianised and military is unclear); and the 'conversion of contractor positions to less

expensive full-time civilian positions'. What they probably mean is the creation of a more cost-effective mix of civilian, military and contractor employees by replacing non-deployable military personnel and contractors with civilians.

In the case of military personnel we know that there are potential savings because civilians cost on average around 30% less than military personnel (see Section 2.5). And we are told that civilians cost 15–30% less than contractors—though this begs the question of why the positions were contracted-out back in the 1990s.

Even if we credit the mechanism, the scale of the savings is hard to reconcile. To save, say, \$150 million a year would require the substitution of at least 5,000 military personnel (per-capita cost \$130,000) by 5,000 civilians (per-capita cost \$100,000). Yet we know that the changes to the size of the civilian and military workforce are far less. In fact, it has been disclosed that only 1,100 military positions are slated for civilianisation – worth only around \$33 million a year.

So where does the rest of the \$1.9 billion of savings come from? Clearly, there is a lot more that we have not been told.

One possible explanation is that, in addition to civilianisation, existing positions are being disbanded (a saving) and new ones are being established (a reinvestment). We know that there will be workforce reductions in some areas from the consolidation and centralisation of services. By this route, to save \$100 million a year 800 military or 1,000 civilian positions would have to be cut and then allowed to rise phoenix-like from the fire of reform. The trouble is that without visibility of what is happening, we would have no way of knowing if this was just another pea-and-thimble trick like the 50,000 ADF strength buyback in the Defence Reform Program.

In any case, \$1.9 billion of workforce savings over the decade are equivalent to around \$155 million out of the present budget once out-turning and salary growth are taken out. This represents only a 1.8% saving on the \$8.8 billion annual personnel budget.

Information Technology and Communications (ITC) (\$1.9 billion over 10 years)

The White Paper sets out an ambitious program for the ‘networking’ of Defence—operationally and corporately. Space prohibits reproducing the many innovations that are promised aside from mentioning the notion of a single ‘Defence Information Environment’.

An important part of the White Paper’s vision for Defence ITC is a more rigorous governance framework including greater standardisation and centralisation. Nonetheless, amid all this new development, there is somehow room for savings of \$1.9 billion over the decade. Savings will be delivered through: centralisation of investment, consolidation of data centres and faster decision cycles.

To save \$1.9 billion over the decade, around \$170 million of ITC costs will need to be cut in terms of the present budget (taking account of out-turning). Unfortunately, we do not know how much is presently spent.

Other including major capital equipment procurement (\$5.9 billion over 10 years)

The largest single category of savings is the least explained. All we know is from a press release which says that the savings will include ‘more effective major equipment procurement practices’. Perhaps this means that, consistent with the recommendations of the Mortimer Review, a larger share of off-the-shelf military equipment will be purchased than was previously planned. If so, what are the specific projects that were going to be developmental or Australian-unique which are now going to be off-the-shelf?

Analysis

Given the paucity of detail, it is hard to say much about the proposed savings other than a few general points;

- the apparent impact on the workforce is very small compared with previous efficiency programs
- a high reliance is placed on improving productivity within and with the private sector
- significant ‘business reengineering’ will be necessary within Defence as an integral part of the reforms.

It is unclear how the new outputs-driven budget arrangements (which we assume will give money directly to the capability managers) fits in with the more centralised approach to the delivery of shared services and non-equipment procurement by the SRP. What is the point of giving money to the capability managers if they have no choice but to purchase standardised goods and services from an in-house provider? It looks surprisingly like central planning is alive and well—it’s just that the five-year plan is going to be more efficient.

The inevitable soundtrack to each and every Defence reform program, is a chorus announcing clearer responsibility and greater accountability. Perhaps this time it will happen. But how will accountability be exercised? Will senior managers be subject to sanctions and incentives? As with the SRP as a whole, much more information is required.

In most areas we will probably never know whether the planned savings are delivered or not. Over the decade, savings will take the form of slower than anticipated increases in costs rather than absolute reductions. In any case, given recent experience, we are unlikely to be given anything more than unverifiable aggregate head-line figures. Even the absence of funding pressures in the years ahead will not be a sign of success. There are billions of extra dollars set to flow into Defence and precious few publicly available targets for what Defence has to deliver.

Notwithstanding these unanswered questions and the absence of public transparency, the Strategic Reform Program deserves to be supported. The best advice from the private sector has been melded with the ideas and experience from across Defence to create a comprehensive program of reform. And all signs are that the senior leadership of the organisation is committed to making the reforms work. This is as good as it gets.

Where will the money go?

Because money is fungible, it is impossible to separate the money freed up by the SRP savings program and that provided by the government in the budget. We need, therefore, to look at the package of initiatives announced in the Budget/White Paper to see where new spending is occurring. Table 4.7 presents our reckoning of the new spending announced in the budget.

By far the largest single slice of money, \$29.3 billion to be precise, will be spent on fixing the budget hole left by inadequate planning by Defence. This includes \$6 billion for the Defence Capability Plan, \$10 billion to cover unfunded Net Personnel and Operating Costs (NPOC), \$5.7 billion to fix the ‘enterprise backbone’ including estate and information technology and a further \$8 billion of unspecified budget shortfalls. On this reckoning, the savings measures will only go two-thirds of the way to making up for past poor planning.

A further \$13.9 billion of new initiatives will be pursued over the next decade including \$1.3 billion over the next four years. Presumably, this represents spending on the new initiatives contained in the 2009 White Paper for things like cyber-security and the urgent replacement of maritime helicopters. All up, the planned initiatives over the decade total \$44.9 billion with \$9.5 billion to be spent over the next four years.

Table 4.7: Where the money will be spent

	The next four years: 2009-10 to 2012-13 (\$m)	The next decade: 2009-10 to 2018-19 (\$m)
What the 2009-10 PBS said:		
Defence Capability Plan	750.6	5,970.4
Budget provisions	4,058.6	17,647.6
Enterprise backbone	1,449.8	5,721.4
subtotal remediation	6,258.9	29,339.4
Other initiatives	1,275.6	13,909.4
\$2 billion savings	2,000.0	1,638.3
total initiatives	9,534.5	44,887.1
What the Minister said about remediation:		
Defence Capability Plan	1,000	6,000
Budget provisions		
Net Personnel and Operating Costs (NPOC)	?	10,000
Other budget shortfalls	?	8,000
subtotal budget provisions	4,000	18,000
Enterprise backbone	1,000	6,000
subtotal remediation	6,000	30,000

Source: 2009-10 PBS and Ministerial media release 090/2009, 12 May.

The question must be asked: where is the money coming from for the \$44.9 billion of remediation and new initiatives? The net savings amount to \$18.2 billion over the decade and the new White Paper funding model, principally the new indexation regime, injects \$10.5 billion over the decade or \$10.8 billion if we include the payback of deferred money from the start of the decade. This yields a total of \$29 billion from which \$44.9 billion must be found.

There appears to be an extra \$15.9 billion contributed from Defence. As near as we have been able to determine this includes:

- \$7.8 billion of unexplained ‘reprogramming’ which, in part at least, includes delayed spending from the approved capital equipment program
- the final price update in this budget related to the non-farm GDP deflator that adds \$1.9 billion over the decade
- around \$6.3 billion of unallocated funds from price updates in 2008-09 related to the non-farm GDP deflator (made up of \$10.6 billion received in May 2008 minus \$4.3 billion taken away in November 2008).

Because the numbers don’t quite add up, there are likely other minor factors at play.

Nonetheless, a revealing picture emerges. It looks as though \$16 billion of the new initiatives claimed in the budget are funded by displacing old spending (reprogramming), or using money that Defence has received to maintain the buying power of its budget. It is difficult to fully credit the need for \$30 billion of remediation when Defence has within its own resources the ability to cover \$16 billion of this amount including more than \$8 billion it has received as a buffer against rising costs.

Of course, as is the case with much of this year’s budget, the forgoing explanation comes with the caveat that it is our best attempt to make sense of a very opaque PBS.

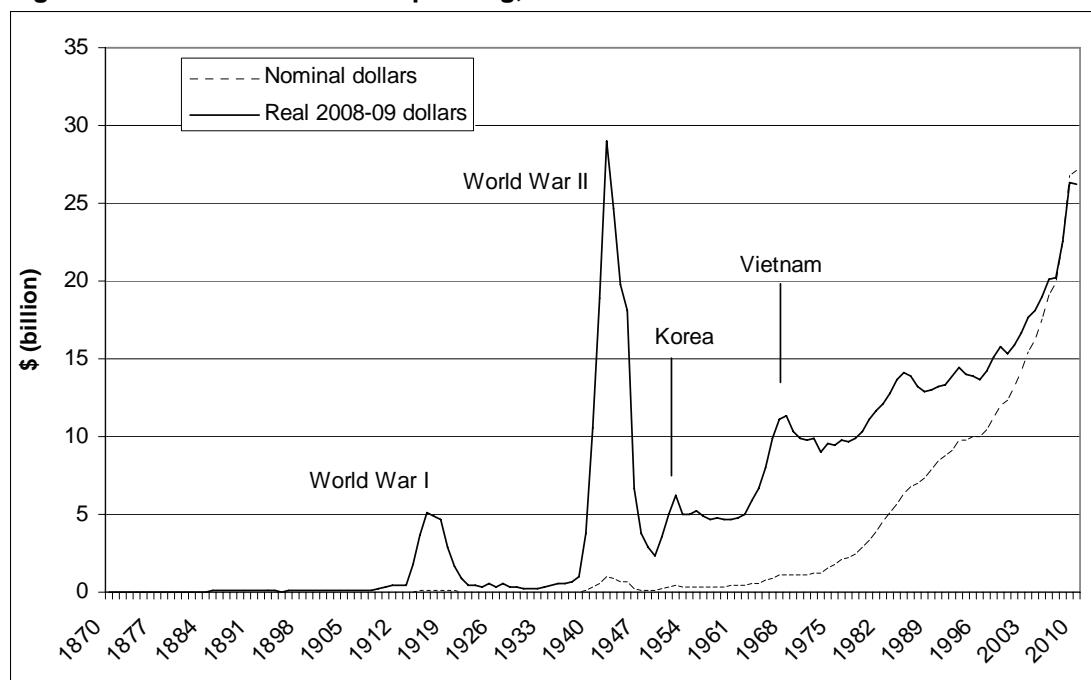
SECTION 5 – DEFENCE ECONOMICS

This section is divided into three parts. The first examines historical Australian defence spending, the second compares present Australian defence spending with that of other countries, and the third examines economic and defence spending trends in our region.

Historical Australian Defence Spending

Real and nominal Australian defence spending from 1870 to the present appears in Figure 5.1. Although inflation dominates the nominal data and obscures much of the historical detail, the impact of the wars of the twentieth century is clearly visible in the ‘real’ data corrected for inflation.

Figure 5.1: Australian defence spending, 1870–2010.

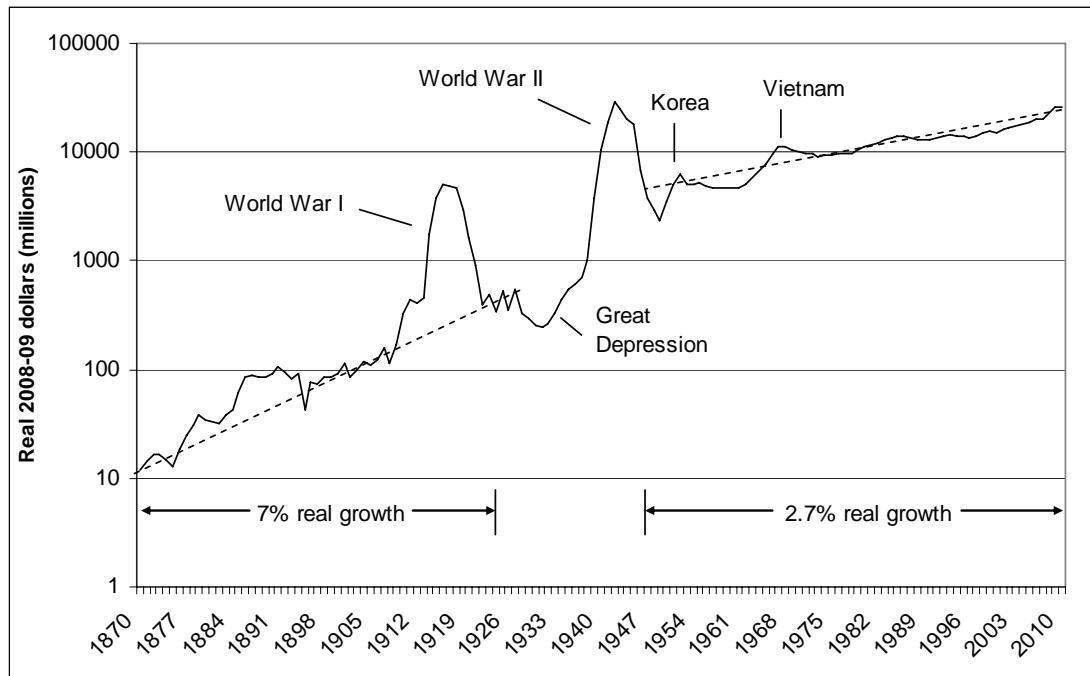


Source: ASPI collation of data from various sources.

An even more useful plot of historical spending appears in Figure 5.2 where real spending has been plotted on a logarithmic scale. On a logarithmic scale, exponential growth (which is close to compounding growth for small rates of increase) appears as a straight line. As shown in Figure 5.2, there have been two epochs of underlying steady growth in defence spending; from 1870 to 1929 spending grew by around 7% per annum, and from 1945 to the present underlying spending grew by around 2.7% per annum.

This should not be taken as implying that the defence force has significantly expanded during the post-war period—it has not. Rather, the observed growth in defence spending largely reflects the rising intrinsic cost of delivering modern military. The 2003 ASPI publication, *A Trillion Dollars and Counting*, estimated that real growth of around 2.65% per annum was necessary just to maintain the present scale and range of capabilities in the ADF. Thus, the recent and ongoing rise of 3% per annum is more about maintaining than significantly expanding the defence force.

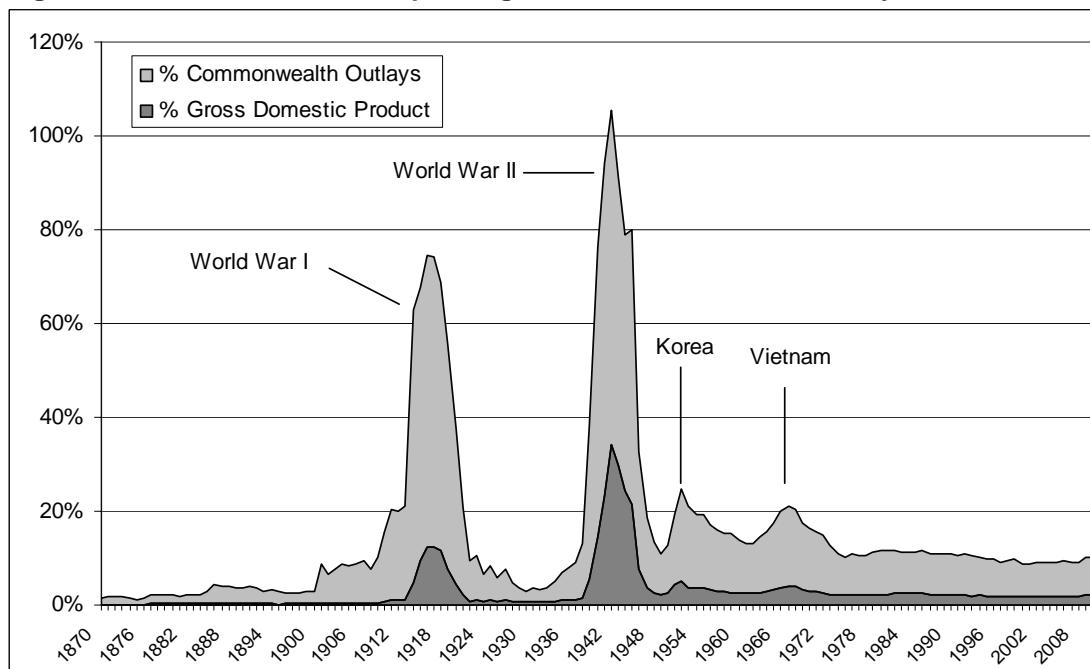
Figure 5.2: Australian defence spending, 1870–2010.



Source: ASPI collation of data from various sources.

The steady increase in real defence spending since the end of the Second World War has been possible because of ongoing growth to the Australian economy over the same period. In fact, as a share of Gross Domestic Product (GDP) the longer-term trend has been for defence spending to account for a progressively smaller share of domestic output. Figure 5.3 plots defence spending as a share of GDP and as a proportion of total Commonwealth outlays.

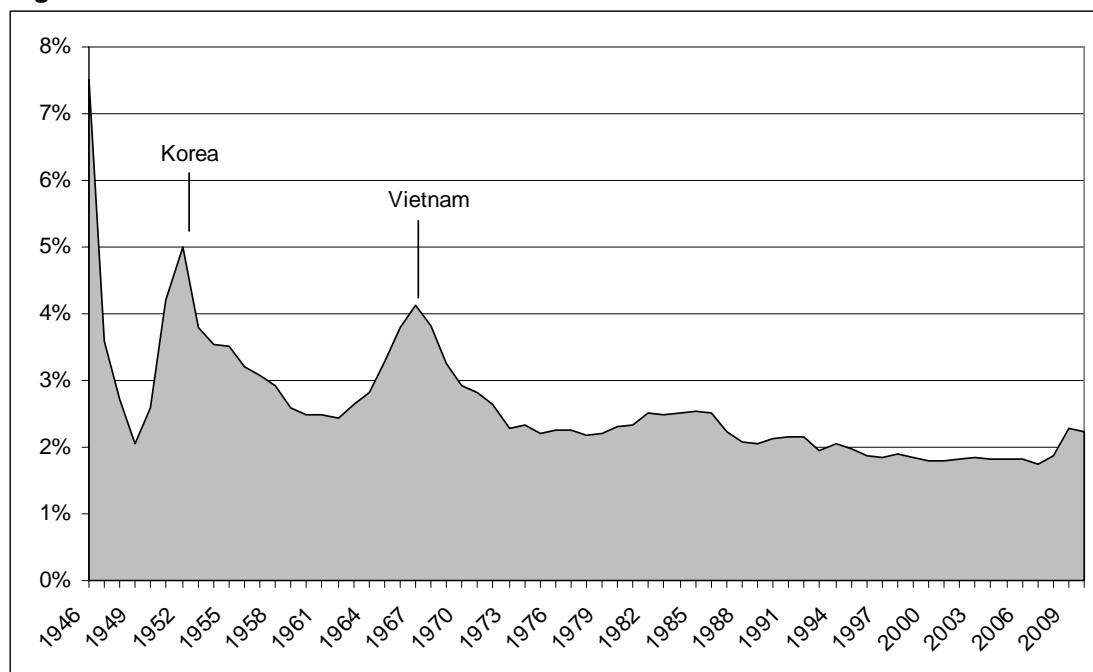
Figure 5.3: Australian defence spending as a share of GDP and Outlays.



Source: ASPI collation of data from various sources.

Given the importance of defence spending as a share of GDP, a magnification of the post-war period has been prepared in Figure 5.4 including the prospective trend out to 2030 based on the government's commitment in the 2009 Defence White Paper and economic growth as projected in Treasury's 2007 Intergenerational Report (but taking into account the anticipated impact of the Global Financial Crisis over the next four years).

Figure 5.4: Defence burden 1945–2010



Source: ASPI collation of data from various sources.

GDP share is not a measure of the adequacy or otherwise of defence spending—that's something that depends on the task at hand. Rather, it measures the proportion of national wealth that a nation devotes to defence. Often, this is captured by the use of the term 'defence burden'.

The planned growth in Australian defence spending will see the share of GDP devoted to national defence rise to 2.3% by 2030 which is high by recent standards (see Figure 5.4 above and Figure 5.5 overleaf). The United States is presently expending 4% of GDP and the United Kingdom 2.3%.

Even taking account of the growing fiscal burden due to the ageing of the Australian population, there is no reason to conclude that a defence burden in the range of 2% to 3% is unsustainable. While it is true that health and ageing will steadily demand a growing share of GDP in the decades ahead, the concurrent rise in individual prosperity (as measured by GDP per-capita) will allow living standards to grow appreciably even if a larger share of national product is diverted for public goods like health, aged care and defence.

A more detailed examination of the affordability of Australian defence spending can be found in the 2008 ASPI publication *Strategic choices: Defending Australia in the 21st century*.

Australia's defence effort in an international context

According to the International Monetary Fund, in 2007 Australia had the fifteenth largest economy on earth measured at market exchange rates (and nineteenth using Purchasing Power Parity—PPP). From this annual bounty of around 1.2 trillion dollars, Australia finds the money to fund its defence. Table 5.1 displays Australia's 2007 defence spending along with that of a selection of countries including allies, regional neighbours and other developed industrial economies around the globe. Note that the figures for Australia in Table 5.1 represent local data rather than overseas reporting. All figures are given in US dollars calculated at prevailing market exchange rates.

Table 5.1: Defence Spending and Burden 2007

2007 GDP		2007 Defence Expenditure		% GDP	
Country	\$US(b)	Country	\$US(b)	Country	%
USA	13,841	USA	552.3	Israel	7.71
Japan	4,413	United Kingdom	63.2	Vietnam	5.42
Germany	3,315	France	60.1	Singapore	4.35
China	3,251	China	46.2	USA	3.99
United Kingdom	2,774	Germany	42.1	Pakistan	3.16
France	2,560	Japan	41.0	South Korea	2.74
Italy	2,098	Italy	37.8	France	2.37
Russian Fed	2,091	Russian Fed	32.2	Taiwan	2.33
Spain	1,434	South Korea	26.6	India	2.32
Canada	1,433	India	26.5	United Kingdom	2.28
India	1,142	Canada	18.5	Malaysia	2.15
South Korea	970	Spain	17.5	Turkey	2.07
Australia	909	Australia	17.0	Australia	1.90
Netherlands	779	Turkey	13.6	Italy	1.80
Turkey	659	Israel	11.6	Russian Fed	1.54
Sweden	454	Netherlands	11.1	Sweden	1.49
Indonesia	433	Taiwan	9.6	Netherlands	1.43
Taiwan	411	Singapore	7.0	China	1.42
Thailand	245	Sweden	6.8	Thailand	1.36
Malaysia	187	Indonesia	4.3	Canada	1.29
Israel	162	Pakistan	4.2	Germany	1.27
Singapore	161	Malaysia	4.0	Spain	1.22
Philippines	145	Vietnam	3.7	New Zealand	1.07
Pakistan	134	Thailand	3.3	Indonesia	1.00
New Zealand	130	New Zealand	1.4	Japan	0.93
Vietnam	68	Philippines	1.1	Philippines	0.78
PNG	5	PNG	~	PNG	0.71

Source: International Institute for Strategic Studies: *The Military Balance*, 2009.

With the caveat that fluctuation in exchange rates can make a significant difference in relative ranking, there are three observations worth making. First, our level of defence spending gives us a budget broadly comparable with Canada and Spain, but far below heavy hitters like Italy, Germany, UK, Japan, France and China. Second, we

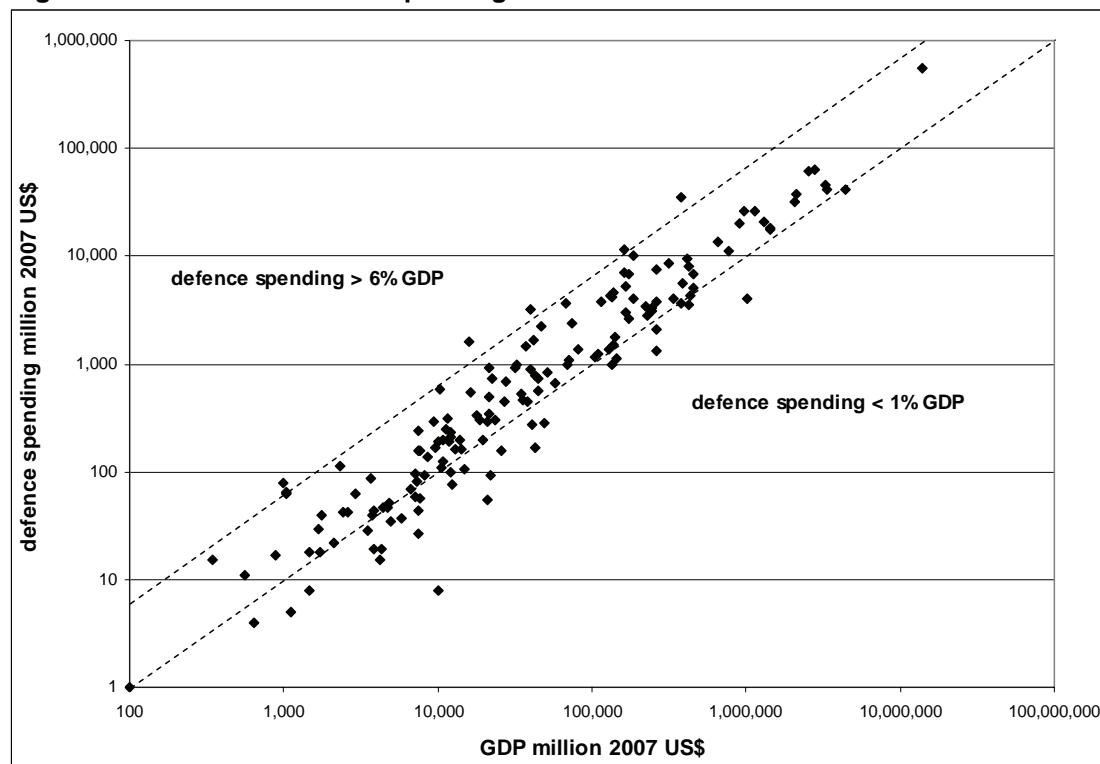
out-spend all our Southeast Asian neighbours by a considerable margin. Third, the United States remains in a class of its own.

In terms of defence spending as a percentage of GDP, we devote significantly more than the Netherlands (1.4%), Germany (1.3%), Spain (1.2%), Canada (1.3%) and Japan (0.9%). According to the data, the only fully developed Western countries to allocate a larger share of GDP than us are the United States (4.0%), France (2.4%) and the United Kingdom (2.3%). Closer to home, we devote a smaller share of GDP than Vietnam (5.4%), India (2.3%), South Korea (2.7%), and Singapore (4.3%), but more than Indonesia (1.0%), Thailand (1.4%) and the Philippines (0.8%). Not surprisingly, we rank well ahead of New Zealand (1.1%).

To summarise, we spend a greater share than most developed Western nations but a lesser share than many of our significant regional neighbours. This probably reflects two things: (1) the synergy derived from collective defence in Western Europe, and (2) that some of our poorer neighbours have to spend a larger share of GDP to meet the demands of a more challenging strategic environment than that of Western Europe.

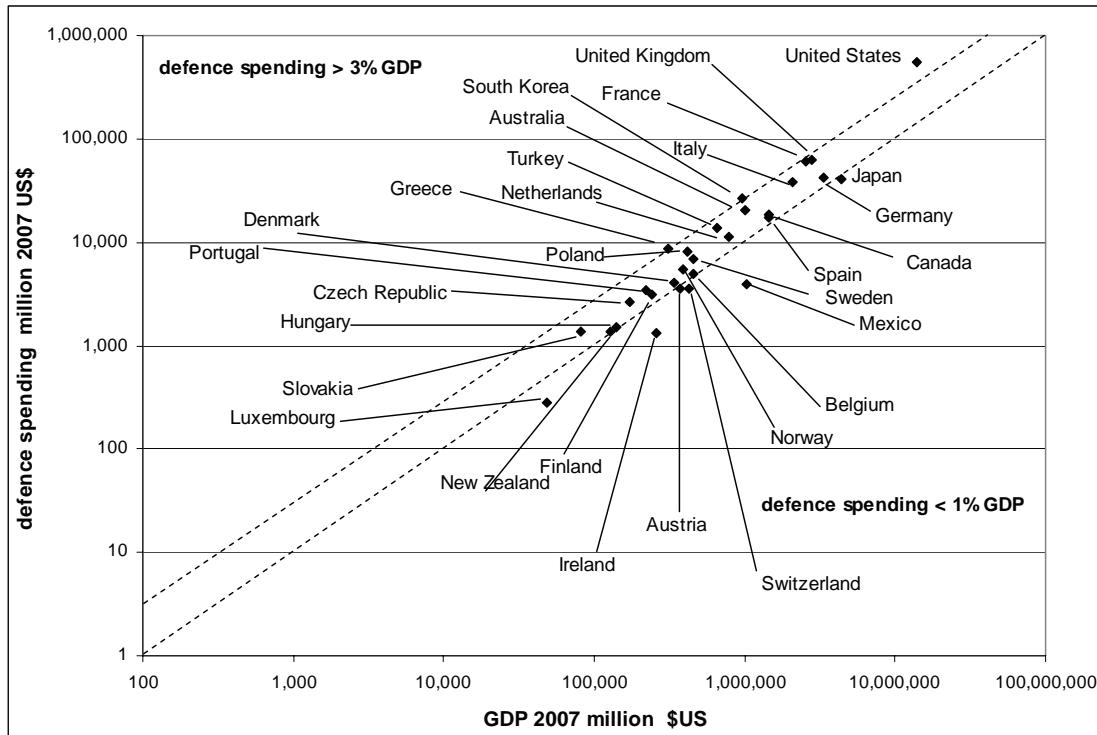
An alternative and often illuminating depiction of the economic resources a country allocates to defence can be achieved by plotting its position on a graph of GDP against defence spending along with other nations. We've done this in Figure 5.5 for some 154 countries based on data collected by the International Institute of Strategic Studies (IISS). In Figure 5.6 we've isolated the results for (mainly) OECD countries. To properly capture the wide spread of GDP and defence spending values, the data has been plotted on a dual logarithmic scale.

Figure 5.5: GDP and defence spending – all countries 2007



Source: International Institute for Strategic Studies: *The Military Balance*, 2009.

Figure 5.6: GDP and defence spending – OECD 2007



Source: International Institute for Strategic Studies: *The Military Balance*, 2009.

A couple of things are immediately apparent. Most obviously, there is a clear correlation between defence spending and economic size; the larger a nation's economy the more it tends to spend on defence. In addition, the vast bulk of nations spend within the band of between one and six percent of GDP on defence. Not surprisingly, those countries that spend larger shares of GDP tend to have more challenging strategic circumstances than those that spend less, or else they are impoverished nations that need to spend a greater share of their meagre resources to achieve a credible capability. Small shares of GDP spending tend to correlate with advantageous geography, strong alliances and benign neighbours. But another factor is also at play. Economically prosperous developed nations tend, understandably, to be able to provide for their defence with a smaller share of GDP.

Money is not the only resource that a nation has available to devote to its defence; there is also people. Table 5.2 lists population numbers, permanent defence forces and numbers and population percentage in the armed services for our selection of allies, neighbours and Western powers.

Here Australia is less well endowed. According to the US Census Bureau, Australia ranked 54th in population in 2008, ahead of Cote d'Ivoire and below Sri Lanka. We have about one-third the population of the larger European powers and less than one-tenth that of the US. In regional terms, we're just a little smaller than Malaysia, North Korea and Taiwan, but only a quarter the size of Thailand and the Philippines. Indonesia has more than ten times our population, and we are but a drop in the ocean compared with India and China. The sobering fact is that we account for less than one-third of one percent of the world's people.

Table 5.2: Human Resources

Country	POP 2008	Country	Armed Forces	Country	% of POP
China	1,330,044,605	China	2,185,000	North Korea	4.71%
India	1,147,995,898	United States	1,539,587	Israel	2.48%
United States	303,824,646	India	1,281,200	Singapore	1.57%
Indonesia	237,512,355	North Korea	1,106,000	South Korea	1.40%
Pakistan	167,762,040	Russian Fed	1,027,000	Taiwan	1.27%
Russian Fed	140,702,094	South Korea	687,000	Russian Fed	0.73%
Japan	127,288,419	Pakistan	617,000	Turkey	0.71%
Philippines	92,681,453	Turkey	510,600	France	0.55%
Vietnam	86,116,559	Vietnam	455,000	Spain	0.55%
Germany	82,369,548	France	352,771	Vietnam	0.53%
Turkey	71,892,807	Thailand	306,600	United States	0.51%
Thailand	65,493,298	Indonesia	302,000	Italy	0.50%
France	64,057,790	Italy	292,983	Thailand	0.47%
United Kingdom	60,943,912	Taiwan	290,000	Malaysia	0.43%
Italy	58,145,321	Germany	244,324	Pakistan	0.37%
South Korea	49,232,844	Japan	230,300	Germany	0.30%
Spain	40,491,051	Spain	221,750	Australia	0.26%
Canada	33,212,696	Israel	176,500	United Kingdom	0.26%
Malaysia	25,274,133	United Kingdom	160,280	Netherlands	0.24%
North Korea	23,479,089	Malaysia	109,000	New Zealand	0.22%
Taiwan	22,920,946	Philippines	106,000	Canada	0.19%
Australia	20,600,856	Singapore	72,500	Sweden	0.19%
Netherlands	16,645,313	Canada	64,371	Japan	0.18%
Sweden	9,045,389	Australia	53,167	China	0.16%
Israel	7,112,359	Netherlands	40,537	Indonesia	0.13%
PNG	5,931,769	Sweden	16,900	Philippines	0.11%
Singapore	4,608,167	New Zealand	9,278	India	0.11%
New Zealand	4,173,460	PNG	3,100	PNG	0.05%

Source: International Institute for Strategic Studies: *The Military Balance*, 2009.

Our permanent armed forces in 2008 amounted to around 53,167, which puts us near the bottom of the table in our selection of countries. Overall, there are more than 59 countries with armed forces numerically superior to ours. As a proportion of population, we have one-quarter of one percent of our population engaged as full-time military personnel. This is less than European nations Germany (0.30%) and France (0.55%), and behind the United States (0.51%). In fact, in our selection, the only Western countries we comfortably beat are those well-known strategic optimists, Canada and New Zealand (both of which have their strategic approaches covered by more powerful neighbours). In regional terms, we fall well behind Singapore (1.57%), Malaysia (0.43%) and Thailand (0.47%) but ahead of Japan (0.18%), China (0.16%), Indonesia (0.13%) and the Philippines (0.11%).

Australia's relatively modest ranking in terms of proportion of population needs to be seen in the context of our avowed 'maritime strategy'. With the exception of a short period in the 1960s which saw conscription boost the Army to over 40,000, Australia has never maintained a large peacetime standing Army. As a country with no land borders and no prospective adversaries with an amphibious capability, the imperative to develop a manpower-intensive land force is slight.

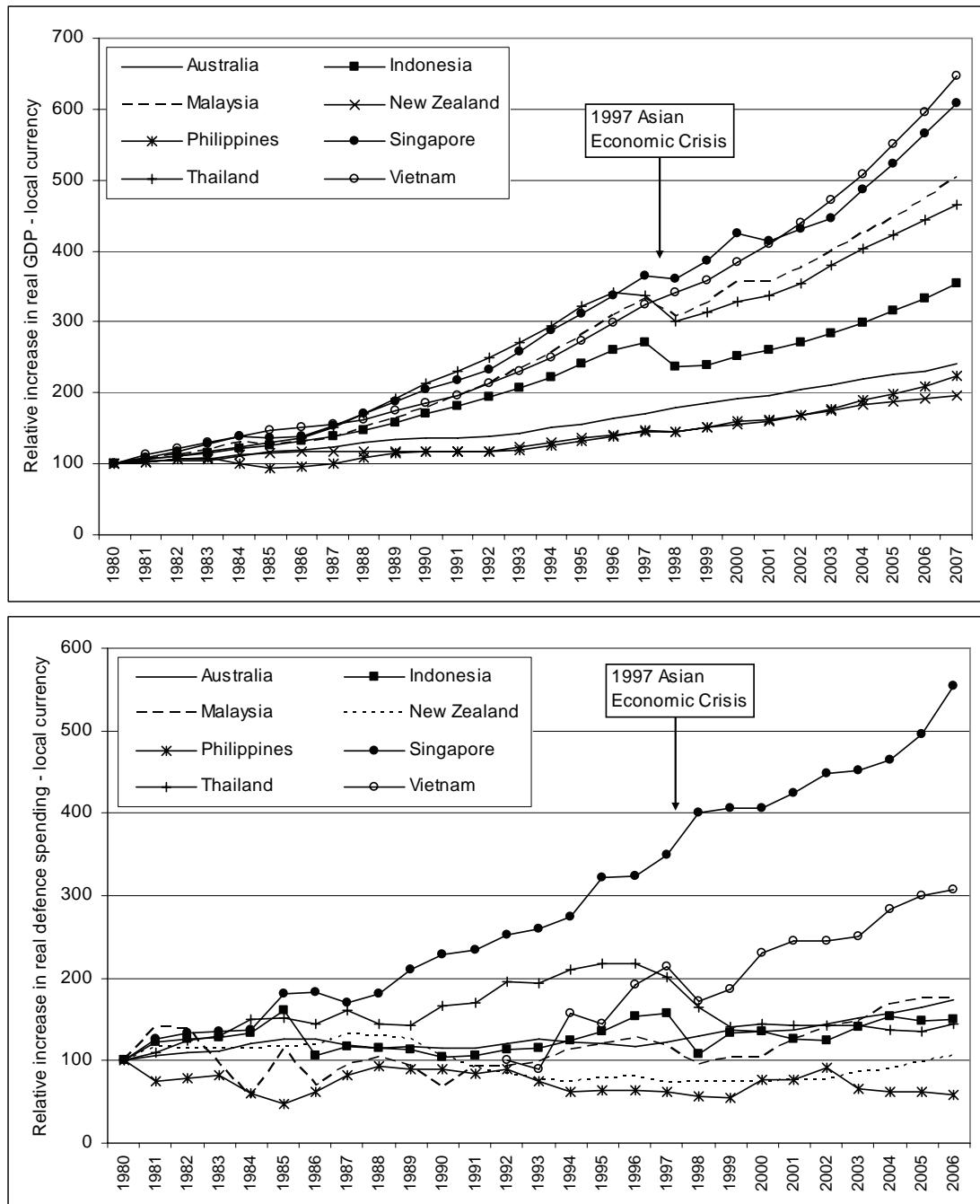
Regional Economic and Defence Spending Trends

The least ambiguous way to track *relative changes* in the size of a country's economy is to adjust its GDP in local currency to a single base-year using its GDP-deflator.

Similarly, the least ambiguous way to track *relative changes* in defence spending is to adjust spending in local currency to a single base year using its CPI index.

With 'real' GDP and defence spending so calculated, the relative growth between countries can be compared by normalising the initial values in the base year. This has been done for a selection of countries in maritime Southeast Asia and Greater Asia in Figures 5.7 and 5.8. Data sources for these and subsequent graphs are listed at the end of this section.

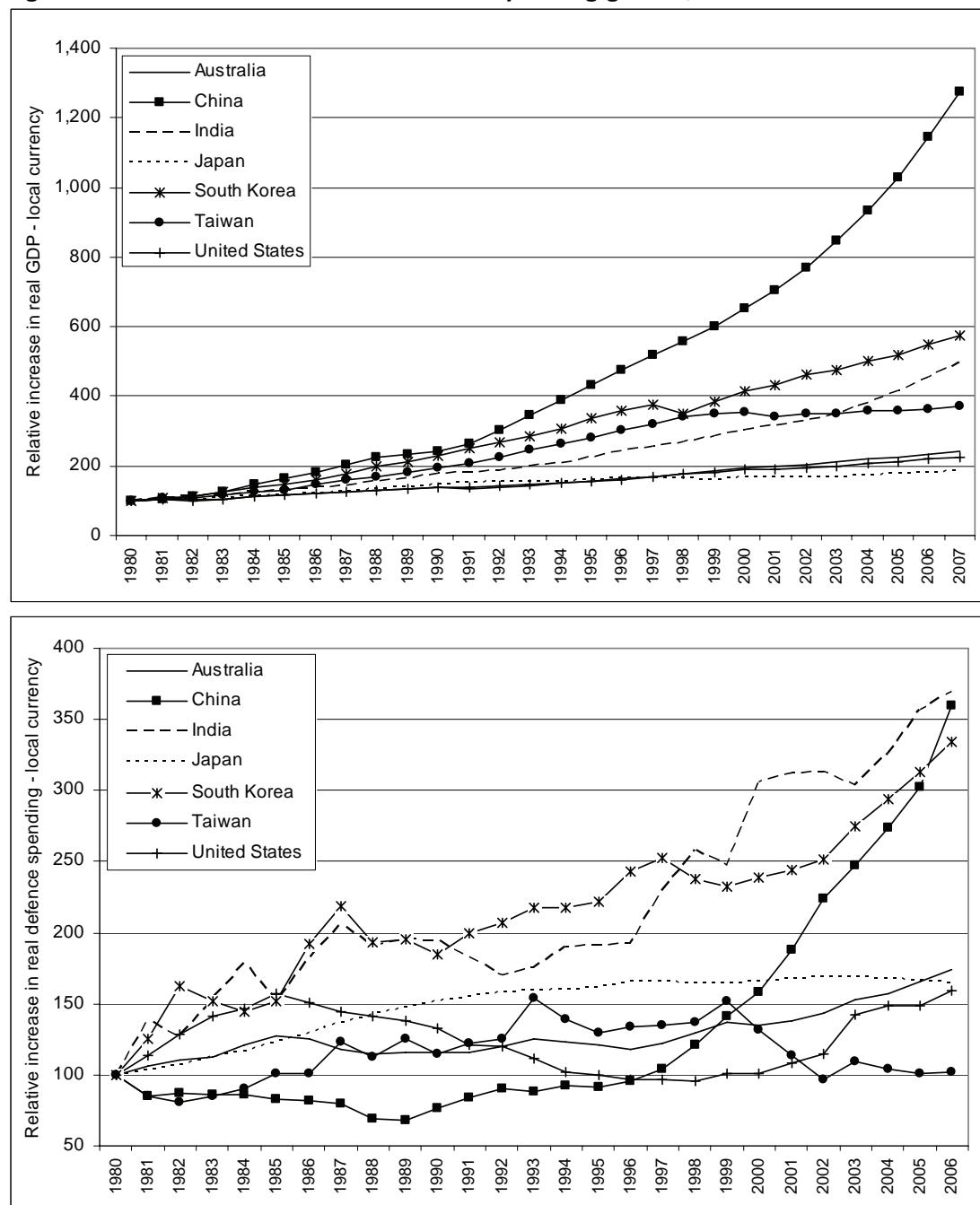
Figure 5.7: Relative economic and defence spending growth, Maritime Southeast Asia



It is clear that developing countries have achieved faster economic growth than their more-developed counterparts. China in particular has achieved spectacular economic growth since the early 1990s—though its military spending did not take off until around a decade later. Among the countries of maritime Southeast Asia, Singapore has managed steady economic growth which has been reflected in a similar trend in their defence spending. In comparison, our closest neighbour, Indonesia, has achieved healthy economic growth but has not taken the opportunity to increase its defence spending.

The impact of the 1997 Asian Economic Crisis is apparent in Figure 5.7 and to a lesser extent in Figure 5.8.

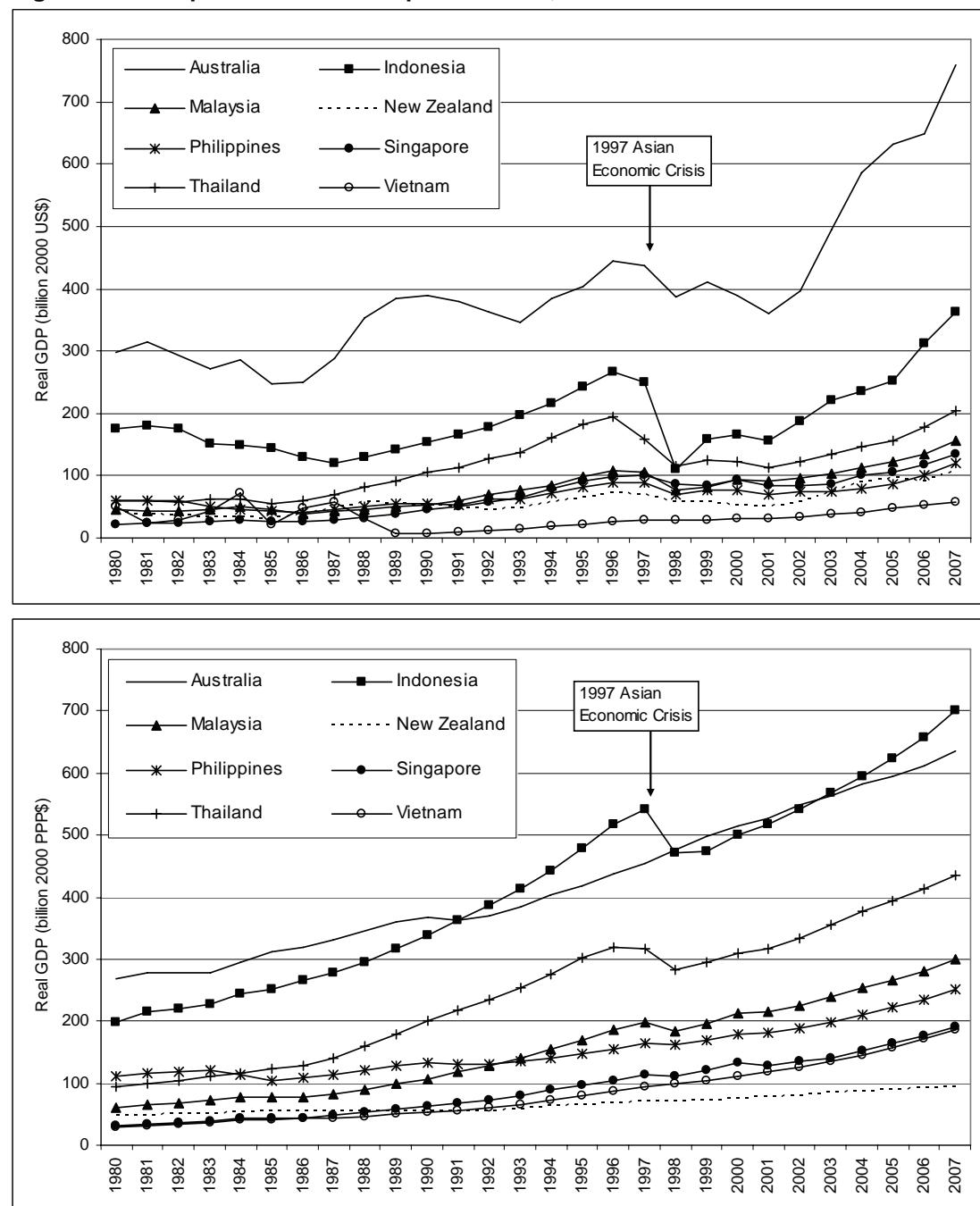
Figure 5.8: Relative economic and defence spending growth, Greater Asia



Comparative economic performance

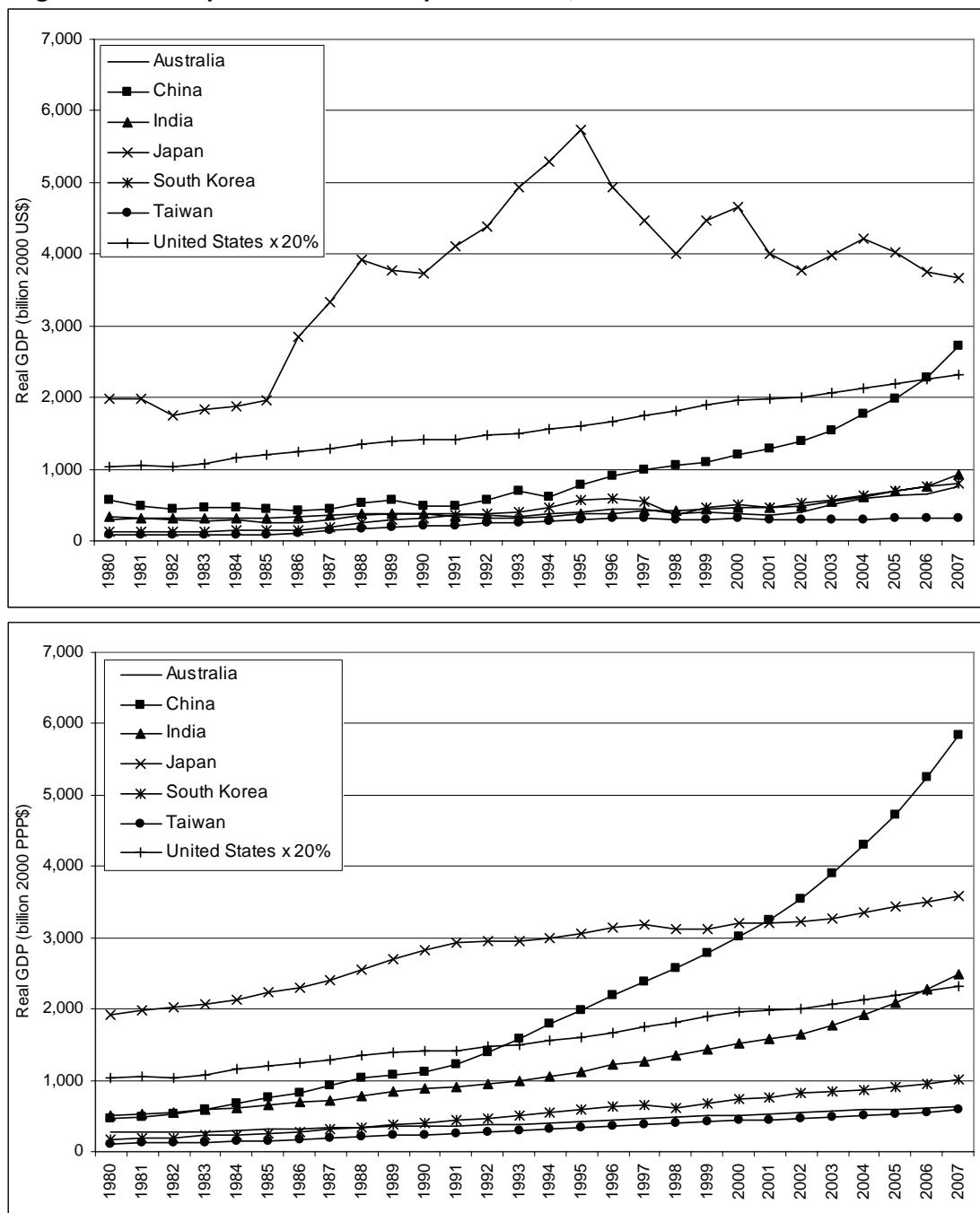
Comparing the relative size of economies (as opposed to the relative rate of growth in size) requires converting the domestic currencies involved to a common currency. In practice, this is performed in one of two ways; either by converting to US dollars at prevailing market exchange rates, or by using the World Bank's Purchasing Power Parity (PPP) exchange rates which attempt to capture the buying power of the currency within the country it is used. Typically, PPP exchange rates yield a significantly larger figure for developing countries than market exchange rates. By construction, PPP exchange rates are normalised relative to the US dollar. Figure 5.9 and 5.10 plot national GDP at market exchange rates and PPP for Maritime Southeast Asia and Greater Asia respectively.

Figure 5.9: Comparative economic performance, Maritime Southeast Asia



Whether market exchange rates or PPP exchange rates present a more accurate picture of comparative economic performance is debatable. In some sense, they provide complimentary views of what is occurring. That said; the substantial volatility of international exchange rates (which are driven more by near-term financial factors than long-term economic fundamentals) introduces large transient vagaries into time-series. For example, the rapid rise of Australian GDP in terms of US\$ in Figure 5.9 and the oscillation of Japanese GDP in terms of US\$ in Figure 5.10 are both artefacts of exchange rate fluctuations rather than any reflection of actual changes in economic performance. Note that in Figure 5.10 the size of the United States economy has been scaled by a factor of one fifth to accommodate it on the chart without compressing the data for other countries.

Figure 5.10: Comparative economic performance, Greater Asia



Comparative defence spending—Maritime Southeast Asia

Just as was the case with GDP, comparing the level of defence spending between countries requires conversion to a common basis, usually either US\$ or PPP\$. In terms of maintaining modern high-tech military capabilities, spending expressed in US\$ is probably a better comparative measure. Conversely, the cost of maintaining a large low-tech defence force is probably better compared using PPP exchange rates. Figures 5.12 and 5.13 plot defence spending in Maritime Southeast Asia from 1980 to the present in terms of US\$ and PPP\$ respectively.

The only countries to consistently and significantly increase their defence spending post-Cold War are Australia, Singapore and Vietnam. All the others have either decreased their spending or are still working to recover ground lost in the 1997 Asian Financial Crisis. An equally sanguine picture emerges from the trends in the share of GDP devoted to defence. The long-term trend for all the countries of maritime Southeast Asia is one of declining defence burden. Even for those countries with the fastest growth—Singapore and Australia—GDP share has not been growing by an appreciable amount in recent years.

At the risk of contradicting those who discern a ‘regional arms race’, there is little in the defence spending patterns of Maritime Southeast Asia to support such a conclusion. Given that the cost of high-tech military equipment is increasing by around 4% above inflation every year, it is hard to see how anyone other than Australia and Singapore can afford to modernise or significantly expand their air and naval assets on present spending trends.

Figure 5.11: Defence burden, Maritime Southeast Asia

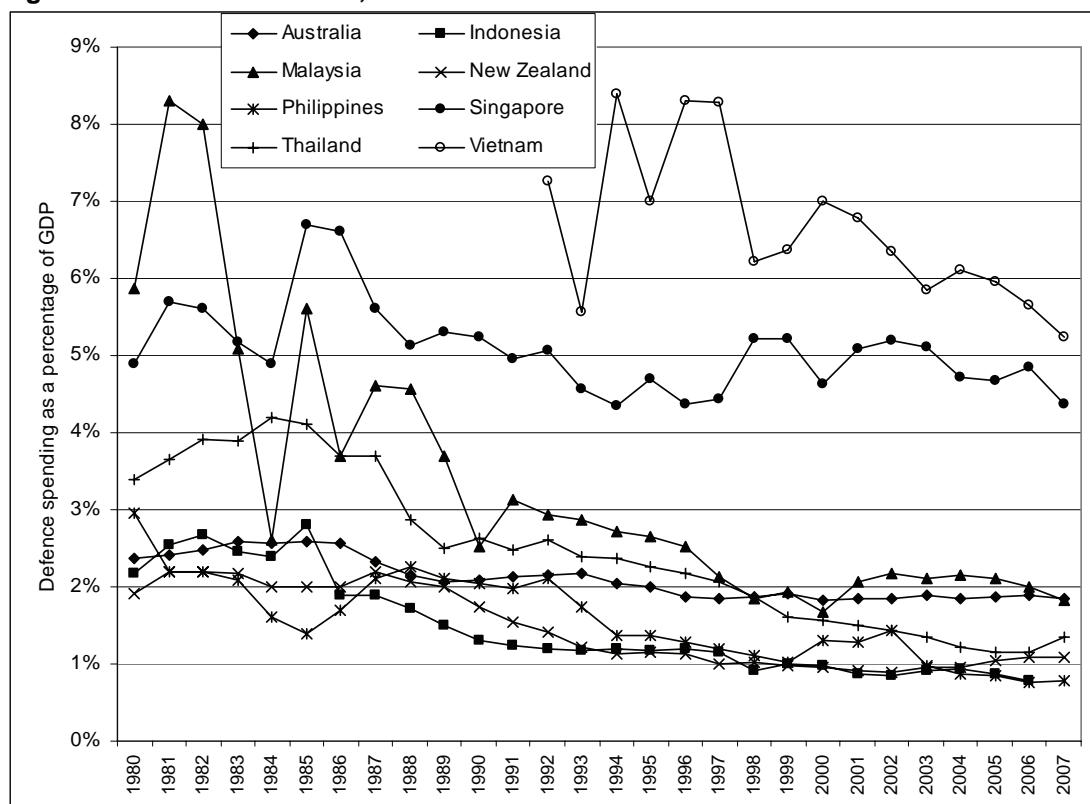


Figure 5.12: Real defence spending (2000 US\$), Maritime Southeast Asia

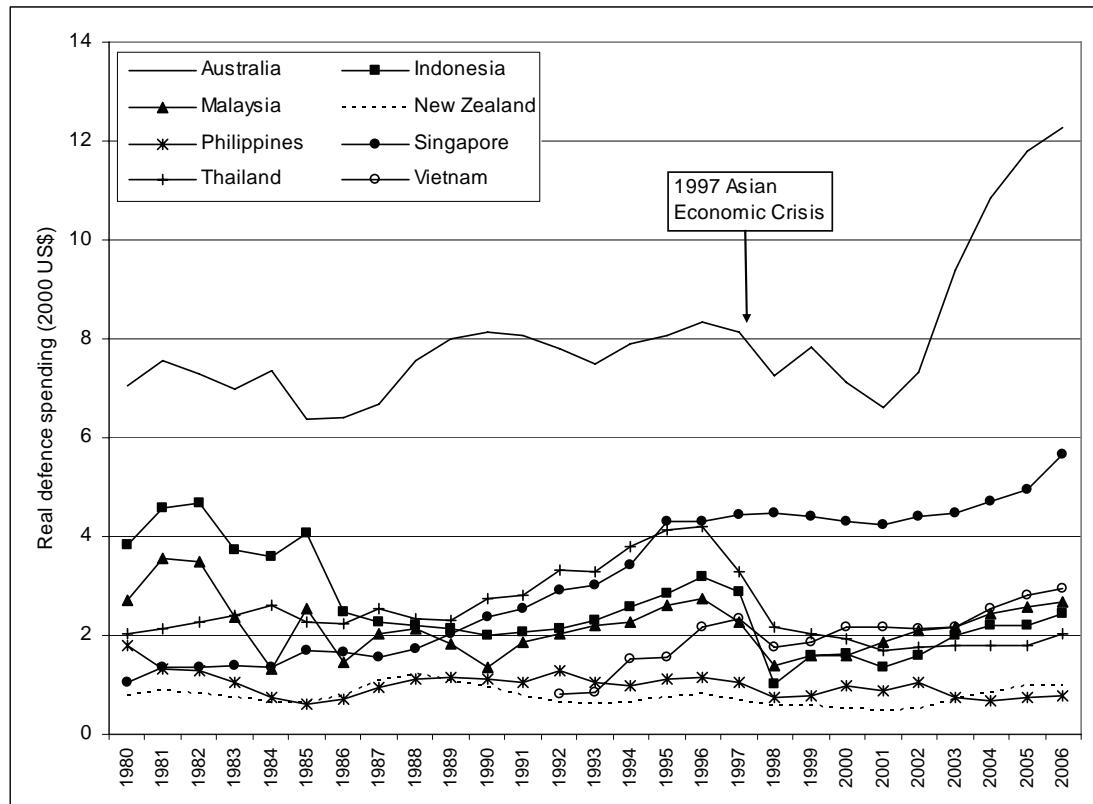
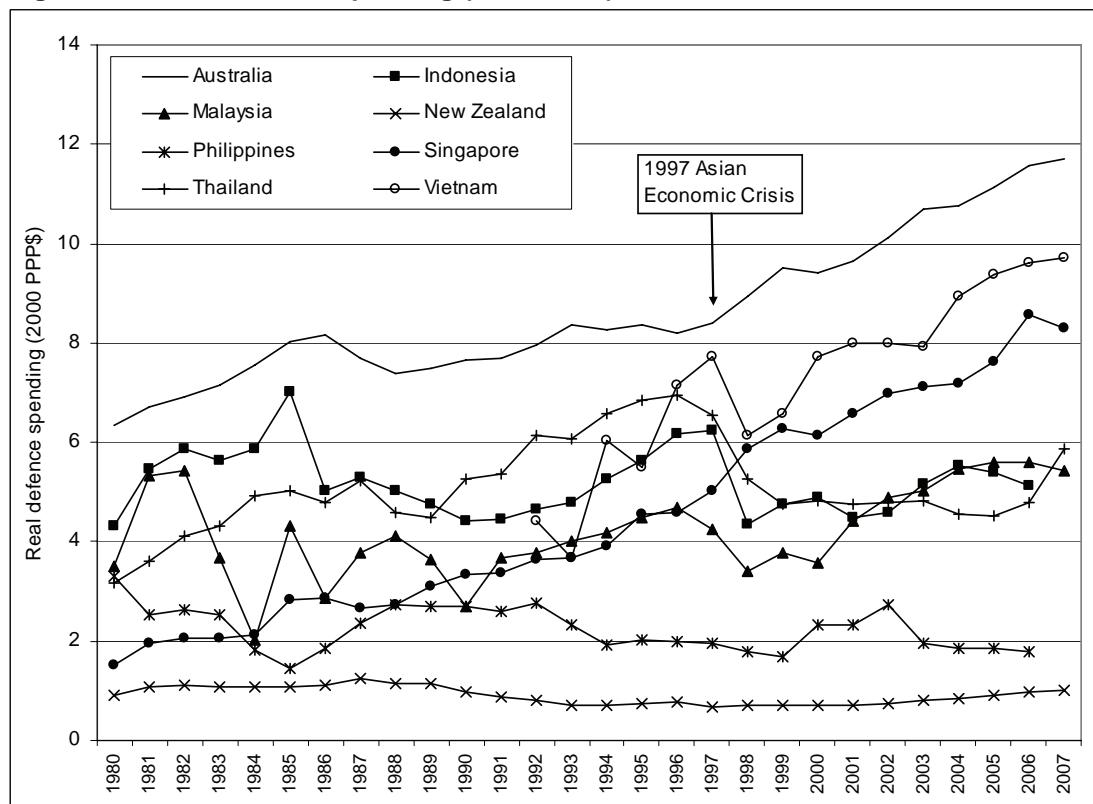


Figure 5.13: Real defence spending (2000 PPP\$), Maritime Southeast Asia



Comparative defence spending—Greater Asia

A somewhat more interesting picture emerges of defence spending in Greater Asia and the United States. The strongest and clearest trend has been the steady and substantial decline in the defence burden carried by countries since 1980, see Figure 5.14. The only countries to exhibit a significant rise in defence burden in the nearer-term (albeit limited compared with historical levels) are China from the late 1990s and the United States from 2001 onwards.

In terms of absolute spending levels (see Figure 5.15 and 5.16) several points are worth making. China's defence spending has grown appreciably by any measure and is now approaching Japan's in US\$ terms having surpassed it in PPP terms late last decade. The United States remains far ahead of any other country but having reduced its spending through the late 1980s and 1990s is now ramping up at a rate only a little slower than China. India's defence spending continues to rise as does South Korea's. Taiwan has given up.

Unlike Maritime Southeast Asia, it is clear that the military balance of power is slowly but surely shifting among Greater Asia and the United States—to the extent that defence spending translates into military capability. China has comfortably overtaken Taiwan, South Korea and India, and is rapidly catching up with Japan. Critically, the Chinese spending figures presented here are taken from official sources (the 2008 Chinese Defence White Paper) and are deemed by many observers to underestimate the true picture. The latest US Pentagon report to congress on Chinese Military Power argues that defence spending by the People's Republic is appreciably larger than disclosed.

Figure 5.14: Defence burden, Greater Asia

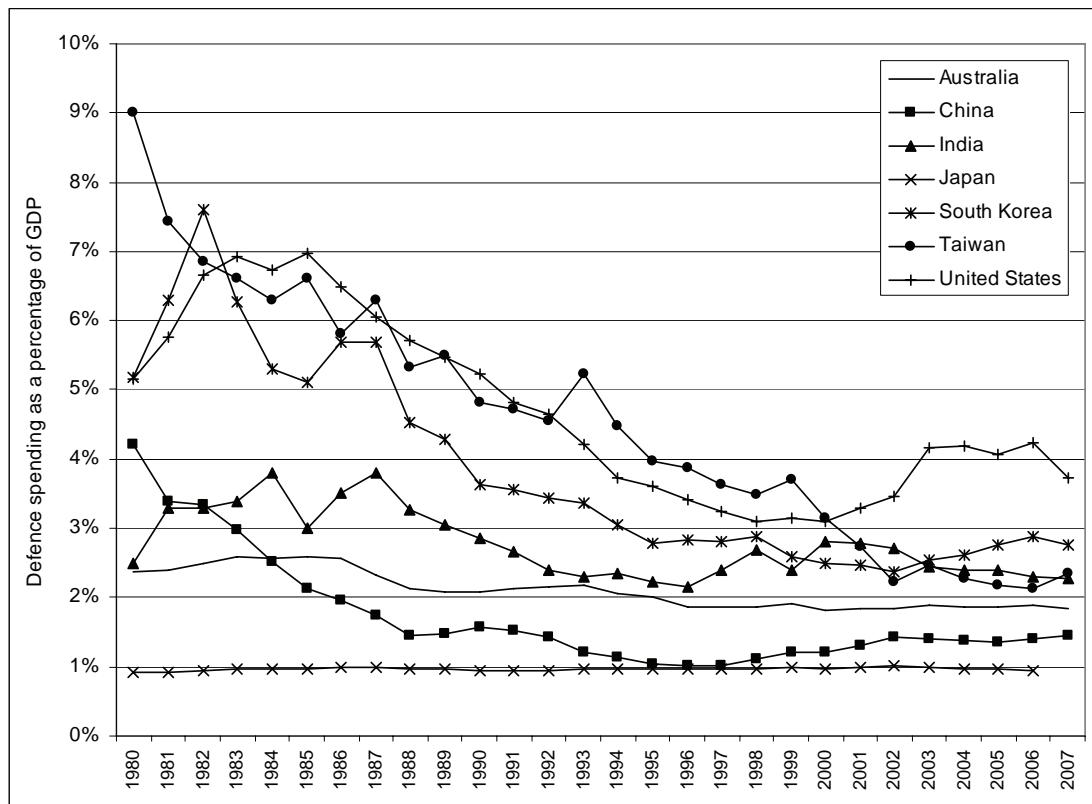


Figure 5.15: Real defence spending (2000 US\$), Greater Asia

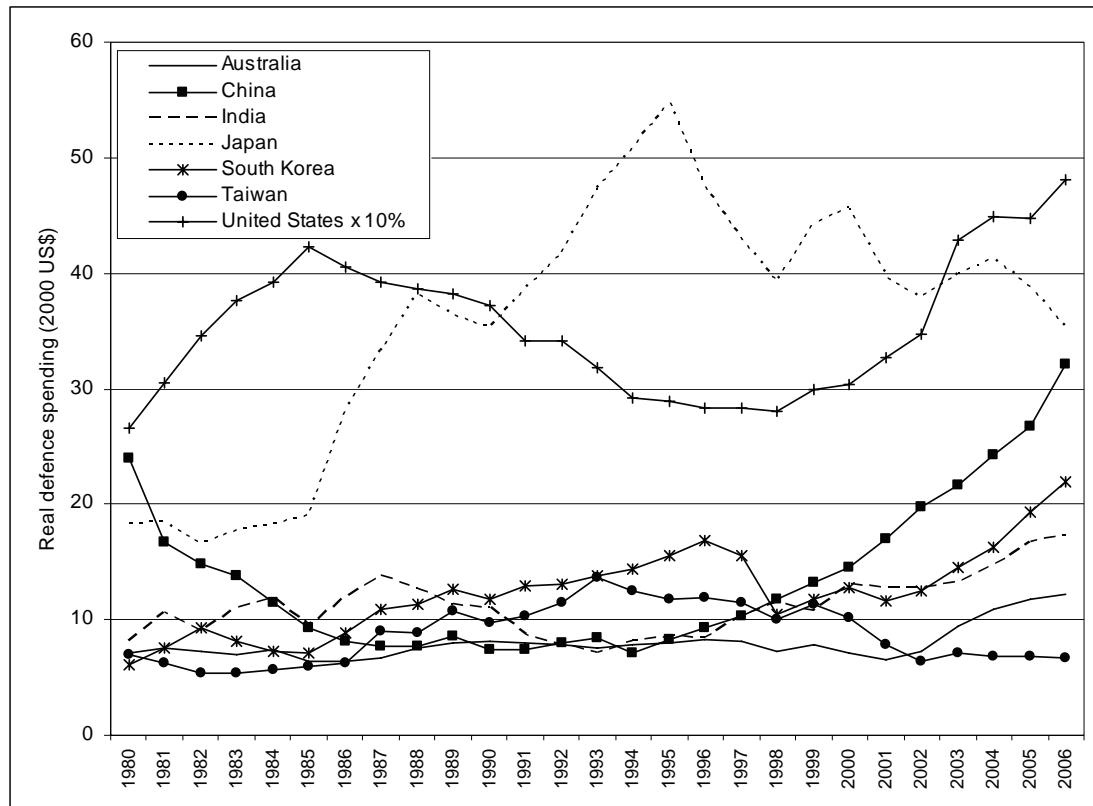
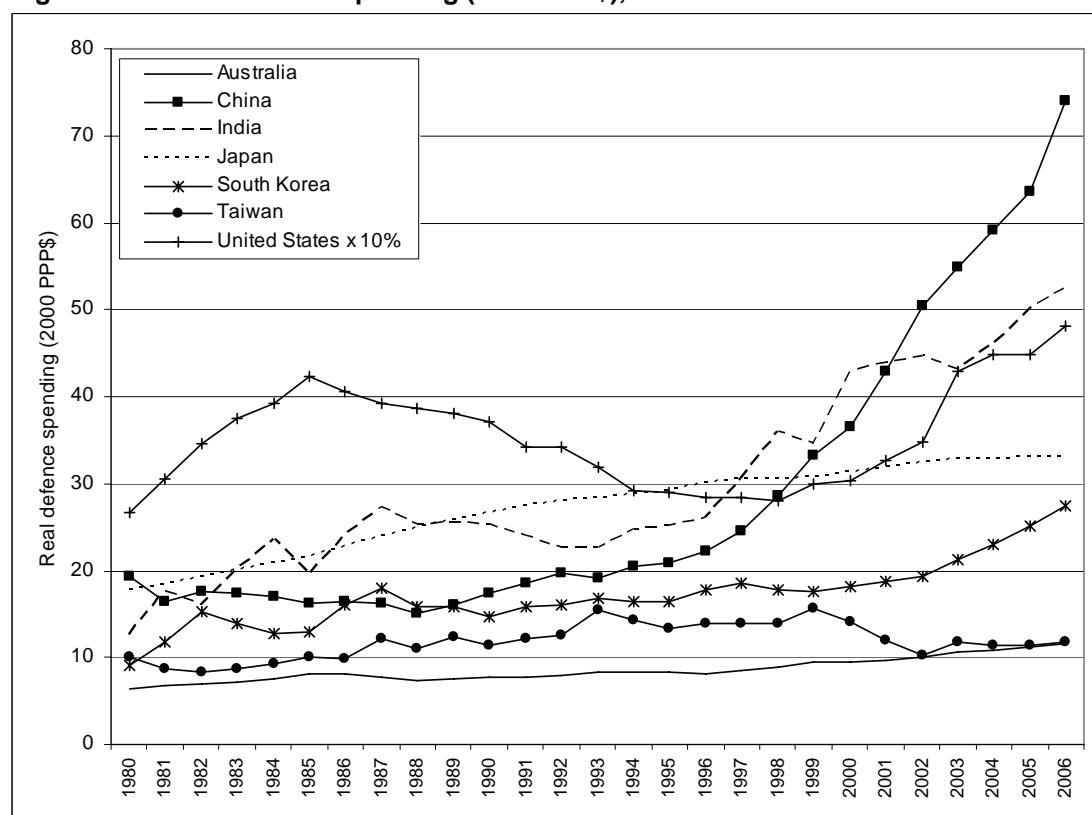


Figure 5.16: Real defence spending (2000 PPP\$), Greater Asia



References and sources

Economic data including GDP, deflators and CPI indices comes taken from the International Monetary Fund's *World Economic Outlook Database 2009* available at <http://www.imf.org/external/pubs/ft/weo/2009/01/weodata/index.aspx>

Most of the defence spending data is taken from successive editions of the International Institute of Strategic Studies' *Military Balance* from 1980 to 2009. Additional data has been drawn from the Department of Defence's *Defence Economic Trends* produced by the Defence Intelligence Organisation between 2000 and 2007. *Defence Economic Trends* is available at <http://www.defence.gov.au/dio/product.html>

Additional national defence spending data has been taken from:

United States National Defense Budget Authorities and Outlays, June 2007, from the Center for Strategic and Budgetary Analysis available at www.csbaonline.org

China's National Defense in 2008, the Defense White Paper for the People's Republic of China, available at <http://china.org.cn/e-white/index.htm>

Historical Statistics of Japan; The Statistical Bureau of the Ministry of Internal Affairs and Communications, Japan, available at <http://www.stat.go.jp/english/data/chouki/index.htm>

See also the *Annual Report to Congress: Military Power of the People's Republic of China, 2009*, US Department of Defense, available at http://www.defenselink.mil/pubs/pdfs/China_Military_Power_Report_2009.pdf

SECTION 6 – THE COST OF WAR

Introduction

The 2003-04 ASPI Budget Brief included a full analysis of the cost of all deployments since 1999-00. Since then, rather than repeat that extensive discussion, we've maintained a shorter format. This section includes an explanation of how Defence is funded for deployments, updated tables of historical deployment costs, a summary of the cost of the Iraq, Afghanistan and other recent operations, and an assessment of the impact on peacetime rates-of-effort of recent operations.

What do we mean by the cost of a war?

As a rule, Defence is supplemented for the *net additional* cost of any major military operation. This makes good sense because, in principle at least, it ensures that Defence does not have to compromise peacetime training to fund operations, and avoids them having to maintain a contingency reserve to cover unanticipated costs. This practice was suspended in 2008-09 because of a surplus of funding but has been reinstated for 2009-10.

Figure 6.1 shows how the net additional cost of an operation is calculated. In the past, Defence only disclosed the aggregate net additional operating cost, the total value of new capital investment and the amount recovered from 3rd parties. However, although offsets remain undisclosed, Defence sometimes provides itemised lists of the individual costs incurred in an operation.

Figure 6.1 Calculating the ‘Net Additional Cost of War’

$$\boxed{\text{Net Additional Cost of War}} = \boxed{\text{Net Additional Operating Cost}} + \boxed{\text{Net Additional Capital Investment}}$$

Where:

$$\boxed{\text{Net Additional Operating Cost}} = \boxed{\text{Additional costs above normal peacetime expenditure}} - \boxed{\text{Offsetting savings due to cancelled peacetime activities}} - \boxed{\text{Costs recovered from 3rd parties}}$$

The net additional operating costs include the additional cost of personnel allowances, shipping and travel, repair and maintenance, health and inoculations, ammunition, contracted support, fuel, inventory, consumables etc. Offsetting savings include the money saved from foregone activities like the cancelled Exercise Crocodile 99 and the Avalon Air Show in 1999-00 due to the deployment of Australian Forces to East Timor. Those costs recovered from 3rd parties include the partial recouping of costs from the UN when participating in a UN peacekeeping operation.

The net additional capital investment usually represents the accelerated filling of capability gaps specific to the operation. Recent examples include the purchase of additional electronic warfare self-protection (EWSP) equipment for the AP-3C

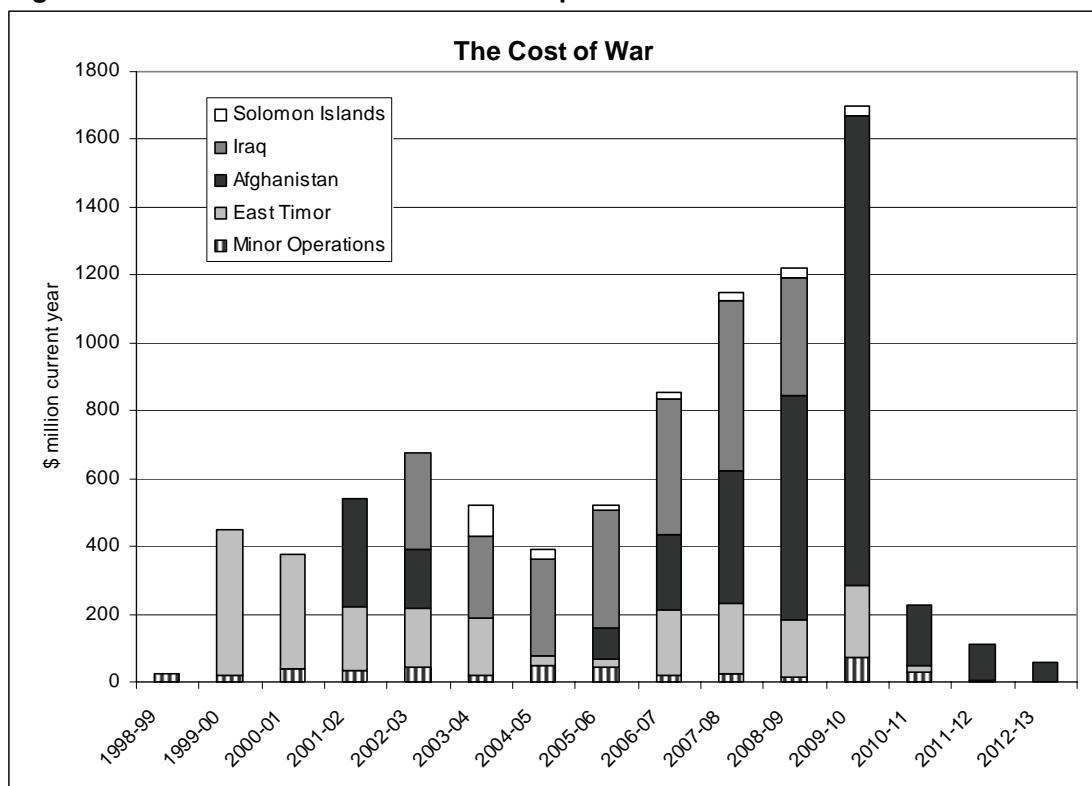
maritime patrol aircraft for Iraq, and the rapid acquisition of the Javelin anti-armour missile for Afghanistan. Capital costs sometimes also include modifications to platforms and additional inventory purchases.

Finally, it's worth being specific about what is not included. The net additional cost of an operation does not include pay and allowances that would normally be incurred, nor does it include the cost of operating platforms within the planned peacetime rate of effort. Nor does it cover the costs incurred outside of Defence by the AFP, DFAT or others involved in operations. Thus, aside from additional items like new equipment, ammunition, transport and contracted services, the net additional cost is the *marginal cost* of increased ADF activity due to an operation.

What's the big picture?

Figure 6.2 shows the net additional supplementation received by Defence for deployments from 1998-99 to 2009-10. Note that Defence had been directed to absorb costs of \$46 million in 2007-08 and \$1,036 million in 2008-09.

Figure 6.2: The net additional cost of ADF operations



Source: Defence Annual Reports and Budget Papers

Minor operations include Bougainville which cost \$109 million between 1998 and 2003 (of which \$43.3 million was absorbed by Defence); Border Protection, which will incur costs of \$151 million between 2001 and 2010; and the 2006 Commonwealth Games (\$13 million).

Figure 6.2 excludes the 'force generation' costs nominally associated with expanding the ADF by 3,555 troops for East Timor in late 1999. This was roughly \$450 million per annum permanently included into the Defence funding base at the time of the

2000 White Paper. In the figure, ‘Afghanistan’ includes the Multinational Interception Force (MNIF) which became part of the Iraq operation in March 2003.

As shown in Figure 6.2, the cost of operations has grown for the sixth year in a row despite the draw-down in Iraq.

New money for operations in the 2009-10 Budget

The PBS explains the additional supplementation that has been provided to cover the net additional cost of operational deployments [PBS pages 26 to 28]. Note that the duration of the spending should not be taken as implying anything final about the likely length of deployment; additional money is often provided post-deployment for repatriation and reconstitution of equipment.

Iraq

The withdrawal of Australian embedded personnel in Iraq will see a net hand back of \$49.5 million. In 2009-10, \$59.9 million will be spent maintaining the Baghdad security detachment pending the transfer of the role to a private security company. The total cost of operations in and around Iraq now stands at \$2.5 billion.

Afghanistan

The government has funded the ADF deployment to Afghanistan until June 2010 at a cost of \$1.4 billion for 2009-10. The total cost of operations in Afghanistan now stands at \$3.6 billion.

Timor-Leste

The government has extended the ADF deployment to Timor-Leste until June 2010 and has provided \$214 million in 2009-10 for that purpose. The total cost of operations in East Timor now stands at \$4 billion including ‘force generation’ supplementation.

Solomon Islands

The government has extended the ADF deployment to Solomon Islands until June 2010 and provided \$29.6 million over one year for that purpose (including previous funding). The total cost of operations in Solomon Islands now stands at \$229 million.

Impact of operations on peacetime rates of effort

The impact of deployments on planned peacetime rates of effort is often counter-intuitive because rates-of-effort sometimes fall due to disruption caused. For example, despite getting \$14 million for increased AP-3C operating costs due to the Iraq deployment during 2002-03, the fleet fell short of its planned rate of effort by 15% in that year. Table 6.1 lists the rate of effort for key platforms employed in recent operations. Unfortunately, figures are not available for Navy vessels, although anecdotal evidence is that they regularly deliver substantial numbers of steaming days in support of operations, well above peacetime rates-of-effort. In 2007-08 the rate of effort for deployed platforms once again tended to fall below the budgeted level. Note that Defence has not requested supplementation for additional flying hours in recent operations.

Table 6.1: Impact of Deployments on flying hour rates

Platform	Budgeted Peacetime Rate of Effort	Actual	% Difference
1999-00 (period including East Timor INTERFET operation)			
Black Hawk	9,260	8,179	-11.67%
Kiowa	8,985	8,379	-6.74%
C-130	16,762	13,144	-21.58%
Caribou	5,080	4,356	-14.25%
2001-02 (period including War on Terror & Border Protection operations)			
C-130	14,000	13,102	-6.4%
F/A-18	13,000	11,287	-13.2%
P-3C	8,660	9,624	+11.1%
2002-03 (period including Iraq war)			
C-130	14,000	13,622	-2.7%
F/A-18	12,500	14,077	+12.6%
AP-3C	9,600	8,172	-14.9%
Chinook	1,270	1,364	7.4%
2003-04 (period including Iraq, East Timor and Solomon Islands)			
C-130	15,000	13,992	-6.7%
F/A-18	12,500	12,820	2.6%
AP-3C	9,100	7,702	-15.4%
Chinook	1,270	876	-31.0%
Black Hawk	8,600	6,864	-20.2%
Kiowa	12,970	11,425	-11.9%
2004-05 (period including Iraq and Solomon Islands)			
C-130	16,000	13,502	-16.0%
AP-3C	8,2000	8,431	3.0%
DHC-4	5,080	3,038	-40.0%
2005-06 (period including Afghanistan, Iraq, East Timor and Solomon Islands)			
Chinook	1,270	1,091	-4.1%
Black Hawk	8,600	6,918	-19.5%
AP-3C	8,200	7,418	-5%
C-130	15,000	13,149	-12.3%
2006-07 (period including Afghanistan, Iraq, East Timor and Solomon Islands)			
Chinook	1,270	1,168	-8.0%
Black Hawk	7,500	6,157	-17.9%
AP-3C	8,200	7,094	-13.5%
C-130	10,000	10,182	1.8%
2007-08 (period including Afghanistan, East Timor and Solomon Islands)			
Chinook	1,270	1,143	-10%
Black Hawk	7,500	6,348	-15%
AP-3C	8,200	7,533	-8%
C-130	9,200	10,235	+11%

Sources: Defence Annual Reports and Portfolio Budget Statements for 1999-00 to 2007-08.

What do we get for our money?

Table 6.2 lists the net additional cost of recent ADF operations, along with a brief description of what the operation entailed. It's important to note that many smaller operations, even the extensive support given to the Sydney Olympic Games, occur without any supplementation. We've done the best we can to separate out the capital component of the funding but in many cases the data is not available. In some cases the figure given for capital represents the minimum amount that has gone towards capital equipment. The indicative number of personnel deployed on operations over the past 26 years is plotted in Figure 6.3. The 450 to 500 people that have been assigned to border protection since 2001 are not included.

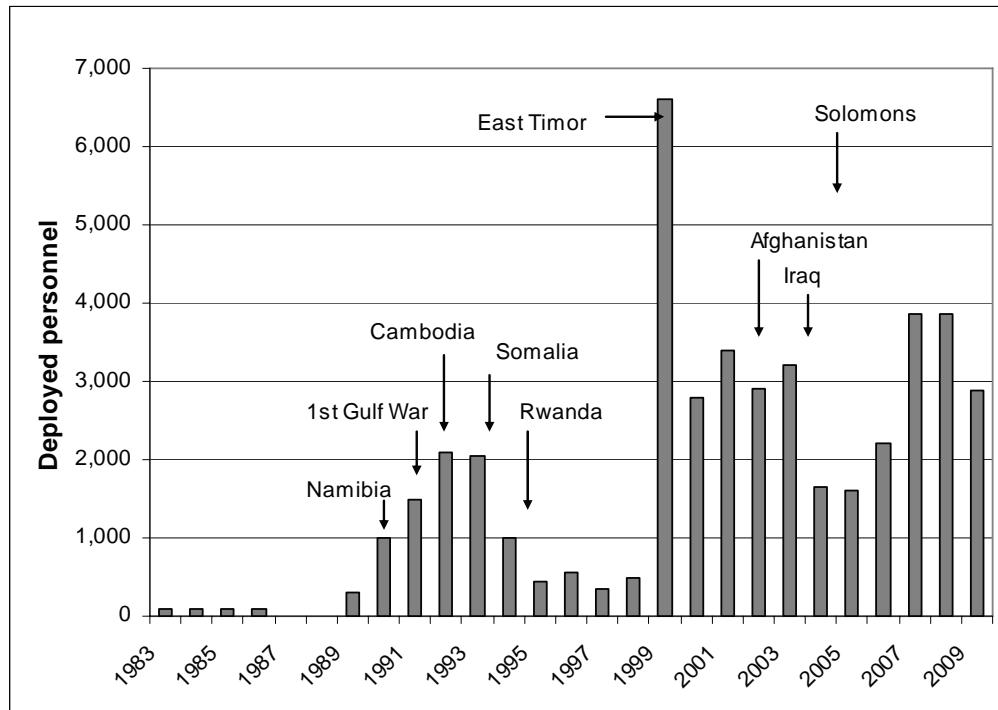
Table 6.2 Supplementation received for the cost of recent ADF operations (\$ million)

Operation	Net Additional Operating Cost	Net Additional Capital Investment	Duration (months)	Description
East Timor 1999-00	429.7	70.4	9	A peak of 6,000 personnel reduced to 1,600 in June 2000. Included 12 Black Hawk plus a troop of Kiowa helicopters, plus extensive airlift (Caribou and C-130) and sealift support.
East Timor 2000-01	335.9	123.5	12	1,610 personnel in theatre. Included 4 Black Hawk and a troop of Kiowa helicopters, Caribou detachment plus airlift and sealift support.
East Timor 2001-02	187.5	0	12	1,470 personnel. Included Battalion Group, troop of Kiowa helicopters plus airlift/sealift support. (Black Hawk & Caribou use unknown.)
East Timor 2002-03	172.4	0	12	1,250 personnel. Included Battalion Group, troop of Kiowa, and detachment of Black Hawk helicopters plus airlift/sealift.
East Timor 2003-04	169.1	0	12	Similar to above but drawing down. By 30 June 2004 there were only around 440 personnel and a Black Hawk detachment remaining.
East Timor 2004-05	27.4		12	Australian contribution to extended UN peacekeeping in East Timor. Around 100 personnel with no helicopters.
East Timor 2005-06	23.9		2	Australian response to request from Timor Leste government for assistance following outbreak of unrest in April 2005.
East Timor 2006-07	191.4		12	Troop numbers vary with need and have ranged between 3,000 in mid-2005 to around 1,100 in mid-2007. Black Hawk (8) and Kiowa (4) helicopters have been involved in the operation.
East Timor 2007-08	205.6		12	
East Timor 2008-09	169.1		12	
East Timor 2009-10	213.8		12	650 personnel, including a joint task force HQ, an infantry battle group (2 companies), aviation task group (with Black Hawks) and a Battery from 16 Air Defence Regiment.
Afghanistan & MNIF 2001-02	180	140	9	1,100 personnel. Included 2 Frigates, 1 LPA Amphibious Vessel, 4 F/A-18 Fighters, 2 B707 Air-to-Air Refuelling Aircraft, 2 AP3C Maritime Patrol Aircraft, C-130 Transport Aircraft, 150 Special Forces plus command elements.
Afghanistan & MNIF 2002-03	169	30	MNIF 9 Afghan 3	1,100 personnel. Included 2 Frigates, 1 LPA Amphibious Vessel, 2 P3C Maritime Patrol Aircraft. C-130 Transport Aircraft, 150 Special Forces plus command elements.
Afghanistan 2003-04	-5	0	-	Remediation and repatriation costs
Afghanistan 2005-06	91	?	9	190 strong SF Task Group for 12 months from September 2005 plus and 2 CH-47D Chinook helicopters with 110 personnel.
Afghanistan 2006-07	223.3	?	12	240 strong Reconstruction Task Force (and 2 CH-47D Chinook helicopters with 110 personnel until April 2007), growing to around 970 by mid-2007 with the addition of Special Force Task Group.
Afghanistan 2007-08	394.9	?	12	1,000 personnel including Reconstruction Task force plus Special Forces Task Group and two Chinook helicopters and support personnel from February 2008.
Afghanistan 2008-09	661.0	?	12	1,080 personnel including Reconstruction Task force plus Special Forces Task Group and two Chinook helicopters.
Afghanistan 2009-10	1,381.1	?	12	1,090 personnel including Mentoring and Reconstruction Task force plus Special Forces Task Group, two Chinook helicopters, Air Control and Reporting Centre, force level logistics. Supported by a frigate in Gulf, and RAAF C-130 and AP-3C detachments (an extra 800 personnel). An extra 450 troops will deploy in 2009-10.
Iraq 2002-03	285.3	?	7	2,000 personnel. Included 2 Frigates, 1 LPA Amphibious Vessel, 14 F-18 fighters, 3 C-130 Transport Aircraft, 2 P3C Maritime Patrol Aircraft, 2 Chinook helicopters, 500 Special Forces, Clearance Diver Team plus command elements.
Iraq 2003-04	240.6	?	12	830 personnel including 279 in Iraq. Deployment included C-130 Airlift detachment, Air Traffic Controllers, AP-3C Maritime Patrol Aircraft, Frigate, Army Training Team, Medical Team various HQ elements and a security

				detachment for the Australian mission in Iraq.
Iraq 2004-05	284.9	17.3	12	Pre-April 05: 920 personnel roughly as per 2003-04. Post-April 05: 1,370 personnel including a 450 strong Task Group to Al Muthanna province along with 40 Light Armoured Vehicles (ASLAV).
Iraq 2005-06	351.4	62.8	12	1,370 personnel including a 470 strong Task Group to Al Muthanna province along with 40 Light Armoured Vehicles (ASLAV).
Iraq 2006-07	398.5	?	12	1,400 personnel including a 515 strong Task Group to Al Muthanna province along with 40 Light Armoured Vehicles (ASLAV).
Iraq 2007-08	501.5		12	1,575 – as above but with additional training personnel.
Iraq 2008-09	348.9		12	As above but with withdrawal of Al Muthanna Task Group from December 2008. 110 strong security detachment, 155 strong C-130 detachment and 170 strong AP-3C detachment to remain.
Iraq 2009-10	59.9	-	12	Baghdad security detachment – 110 personnel 45 embedded personnel being withdrawn.
Solomon Islands 2003-04	90.4	?	12	Initially 1,400 ADF personnel and an unspecified number of civilians. The size of the operation was reduced as stability returned to the country.
Solomon Islands 2004-05	27.6	?	12	Around 30 ADF personnel who assist with AFP patrols and augment headquarters staff. A larger security detachment of around 200 was deployed temporarily.
Solomon Islands 2005-06	17.3		12	Around 30 ADF personnel who assist with AFP patrols and augment headquarters staff. Additional ~ 200 troops were sent in early 2006.
Solomon Islands 2006-07	23.7		12	Around 140 ADF personnel who assist with AFP patrols and augment headquarters staff.
Solomon Islands 2007-08	27.1		12	Around 140 ADF personnel who assist with AFP patrols and augment headquarters staff.
Solomon Islands 2008-09	29.6		12	Around 140 ADF personnel who assist with AFP patrols and augment headquarters staff.

Note: The capital cost of the Iraq operation in the first two years was around \$146.7 million – split unknown. Most supplementation provided in recent years has been in the form of operating costs.

Figure 6.3: Indicative deployed personnel numbers, circa May each year.



SECTION 7 – THE IMPACT OF THE GLOBAL FINANCIAL CRISIS

This section explores the impact of the Global Financial Crisis (GFC) on Australia's defence and security. By necessity, much of the analysis is speculative. Nobody can yet be sure how the GFC will play out, let alone predict with certainty how economic and financial factors might affect geopolitical relations. In terms of the future, the best we can hope for is to be able to survey the possibilities. What follows is divided into four parts:

- a short history of the GFC
- the GFC and defence spending in Australia
- near-term international security consequences
- long-term geopolitics and the GFC.

Economic and financial projections from the April 2009 International Monetary Fund (IMF) *World Economic Outlook* are used extensively below. These need to be viewed with some care; economic projections are uncertain at the best of times and present circumstances make them especially so. Future revisions are more likely to be on the downside.

A short history of the Global Financial Crisis

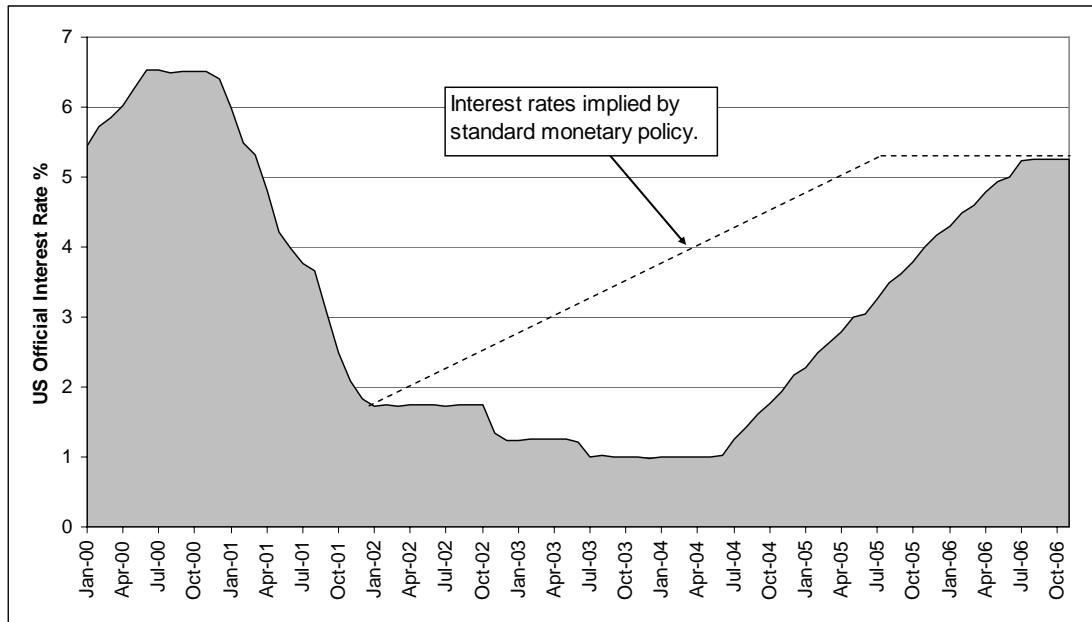
In early 2001 the United States began to slip into recession and official interest rates were cut from 6.5% to 1.75% in the twelve months that followed. Further cuts followed in 2002 and 2003, which saw the official rate bottom out at 1% from mid-2003 to mid-2004.

While the 2001 cuts broadly accorded with standard monetary policy, the cuts in 2002 and 2003 were more aggressive than suggested by prevailing inflation and economic growth, see Figure 7.1. All up, interest rates were held substantially below what routine monetary policy would have indicated for more than three years. In doing so, the Federal Reserve was trying to prevent the United States falling into a deflationary cycle like that which had gripped Japan over the preceding decade. They succeeded, but at a cost.

The long period of lower than normal interest rates had two consequences: first, it gave rise to a housing bubble in the United States, lasting from mid-2002 until the start of 2006. At its height, monthly housing starts were around 33% higher than before the boom. In normal circumstances a housing bubble is a regrettable thing. People rush to buy houses at inflated prices only to see the market crash, leaving some owing more than their house is worth. But these were not normal circumstances.

As a matter of government policy, lenders were encouraged to offer mortgages to low income people. More importantly, mortgage lending became lax because mortgages were increasingly sold by entities other than those bearing the ultimate risk. The wholesale packaging of mortgage debt into tradable financial products then saw doubtful loans spread into investment portfolios far beyond traditional mortgage lenders. In this way, the first tranche of toxic debt was created.

Figure 7.1: Three years of lax monetary policy in the United States



Source: Federal Reserve Board of the United States

The second consequence of a long period of abnormally low interest rates was the so-called ‘search for yield’. This is a euphemistic way of saying that investors became so frustrated with low returns that they increased their risk tolerance to maintain their yields—they started to gamble. Coupled with this elevated ‘risk appetite’ was a period of so-called ‘financial innovation’ that saw an explosion in the amount of money managed by hedge funds and the emergence of increasingly exotic (and opaque) financial instruments like credit default swaps. The ready availability of cheap money saw investors borrow heavily to take a stake in what appeared to be a perpetual motion machine of asset value growth. In this way, a second tranche of potentially toxic debt was created.

It is undeniable that lax regulation of banks and financial institutions allowed these problems to develop. Equally, however, it reflects a comprehensive and systemic failure within private financial institutions and the financial professions. As became clear in 2007 and 2008, many of those paid a hefty premium to manage funds and assets in the US system actually had no idea of the liabilities they held or the risks they faced. Unfortunately, these emerging factors were not restricted to the United States. Housing booms occurred in Europe as did the most egregious excesses in banking practice.

The rest is history. Through 2006 the US housing market collapsed and, by the start of 2007, foreclosures and delinquencies were rising. This led to the sub-prime crisis that saw the first tranche of toxic debt float to the surface. Things bumbled on for a while, with distressed financial institutions in the United States coming forward through 2008 to get assistance. Then, in September 2008 a critical event occurred.

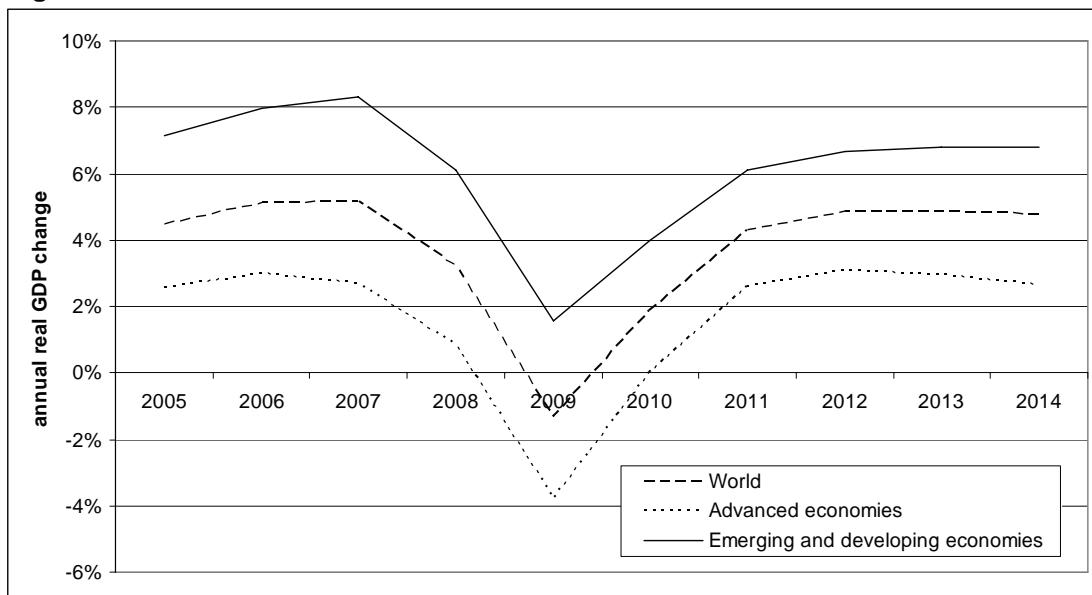
Concerned that endlessly bailing out financial institutions would create a moral hazard, US authorities decided to let US merchant bank Lehman Brothers fold. Faced with no assurance of government support, banks almost immediately became much more risk averse. As a consequence, liquidity evaporated, further eroding the already

fragile position of many financial institutions. There followed a series of massive bailouts of distressed banks and insurers—none of which addressed the underlying problem of toxic debt. The combination of scarce liquidity, falling asset prices and shattered confidence quickly spread to the real economy.

Governments around the world acted quickly on two fronts. Firstly, billions of dollars were pumped into economies to forestall a recession including in Australia. Secondly, governments guaranteed the money held by banks in their countries. The latter move has been catastrophic for some, with the people of Iceland now owing 850% of annual GDP and those of Ireland still trying to work out the bill.

Fast forward to May 2009 and the world is in the grip of a recession the likes of which has not been seen in the post-1945 period. Figure 7.2 shows the anticipated economic contraction globally and for advanced and developing economies separately. As can be seen, the impact is expected to be more severe in the latter.

Figure 7.2: The Great Recession



Source: International Monetary Fund, *World Economic Outlook*, April 2009.

The projected shape of the downturn does not vary much from one country to the next, so the relative impact of the recession can be captured by comparing the depth of contraction projected for 2009 with the growth from 2007. Table 7.1 shows the results for a selection of countries and regions of interest.

Table 7.1: Past and projected economic growth rates for key countries

	2007	2009		2007	2009
Australia	5.7%	-1.5%	China	13%	6.5%
United States	2.0%	-2.8%	India	9.3%	4.5%
G7 industrial countries	2.6%	-3.8%	Indonesia	6.3%	2.5%
United Kingdom	3.0%	-4.1%	ASEAN-5	6.3%	0%
Euro region	2.7%	-4.2%	Korea	5.1%	-4.0%
Russia	8.1%	-6.0%	Taiwan	5.7%	-7.5%
Japan	2.4%	-6.2%	Singapore	7.8%	-10%

Source: International Monetary Fund, *World Economic Outlook*, April 2009.

Note: Australian figures are from the IMF and are for calendar rather than financial years.

Several things stand out in Table 7.1. As we already saw, the impact on advanced economies is much more serious than on developing countries. It would be a mistake not to draw a sharp distinction between countries like China and India, which face slower than usual growth, and countries like Russia and Japan which are set to suffer an absolute economic contraction. Equally interesting is the wide variation in impact among advanced economies; Australia, for example, is facing a much less severe downturn than most other industrialised countries. Even the United States looks to be getting off relatively lightly compared with Europe and, especially, Japan.

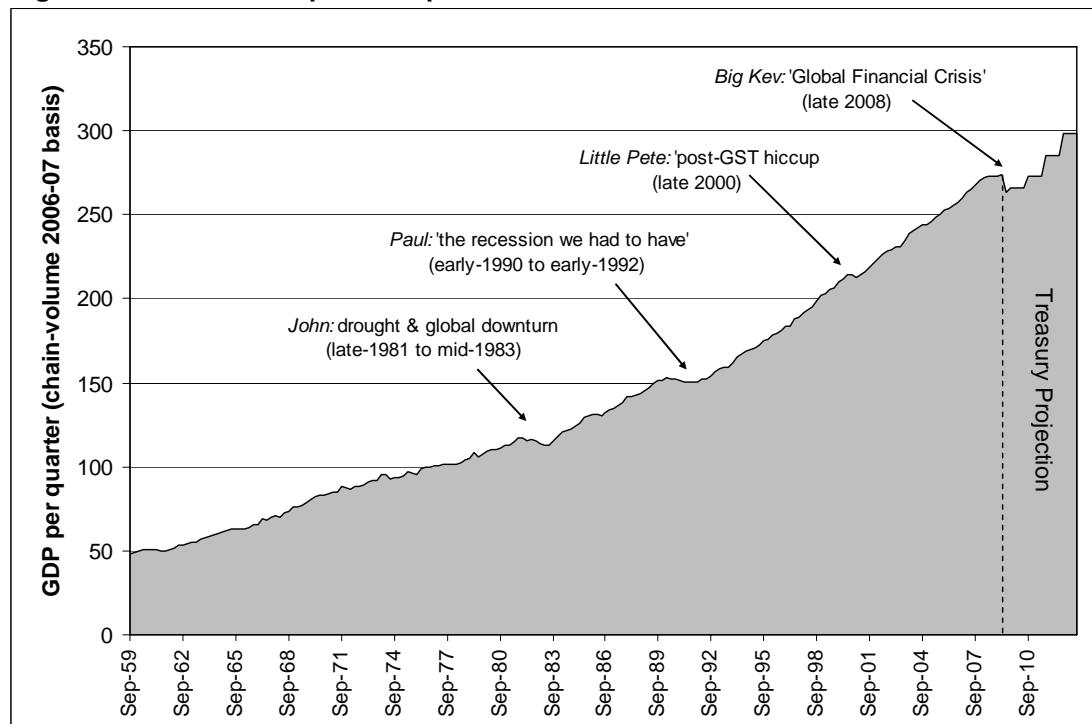
The impact of the GFC on Australian defence

The GFC can impact the defence budget in two ways; either directly through shifts in prices, or indirectly through changes to fiscal policy due to the recession.

Unfortunately, one of the earliest impacts of the crisis was a strong appreciation in the value of the US dollar as investors sought safety in the world's de-facto 'reserve currency'. As Figure 1.2.2 in Section 1 shows, the Australian dollar has depreciated by 26% between mid-2008 and the present. In consequence, the government has had to find an additional \$13.8 billion across the forthcoming decade to maintain the buying power of the defence budget.

To properly understand the likely consequences of the present recession for the defence budget (beyond those disclosed in this budget), it is worth going back to look at previous recessions. There have been three recessions worthy of the name over the past thirty years, and a fourth downturn that warrants a passing mention. These are displayed in Figure 7.3 and are labelled by the political leader most usually associated with them.

Figure 7.3: Recessions past and present

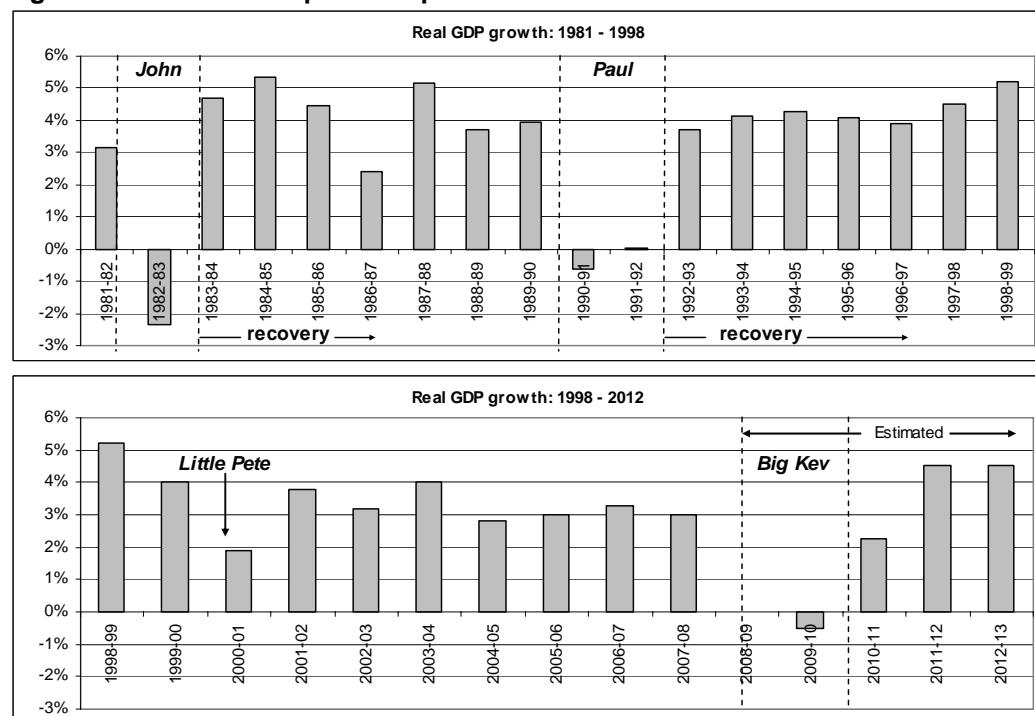


Sources: Reserve Bank of Australia and 2009-10 Treasury Budget Paper #1

The seemingly vast chunk about to be taken out of the Australian economy by the present recession in Figure 7.3 is not as drastic as it first appears. Although it represents a larger volume of lost production than either *Paul* or *John*, it is being taken away from a much larger economy. In percentage terms, the present recession is projected to be of a similar scale to its two predecessors. Compared with the trend in growth at the time, *John* saw the economy forego 7% of growth, *Paul* saw a loss of around 8% and *Big Kev* is projected to result in about the same.

As Figure 7.4 shows, the current recession is projected to be no more and no less serious than its predecessors in the early 1980s and 1990s, though the projected return to full growth seems to be somewhat slower—as it is for most other countries.

Figure 7.4: Recessions past and present

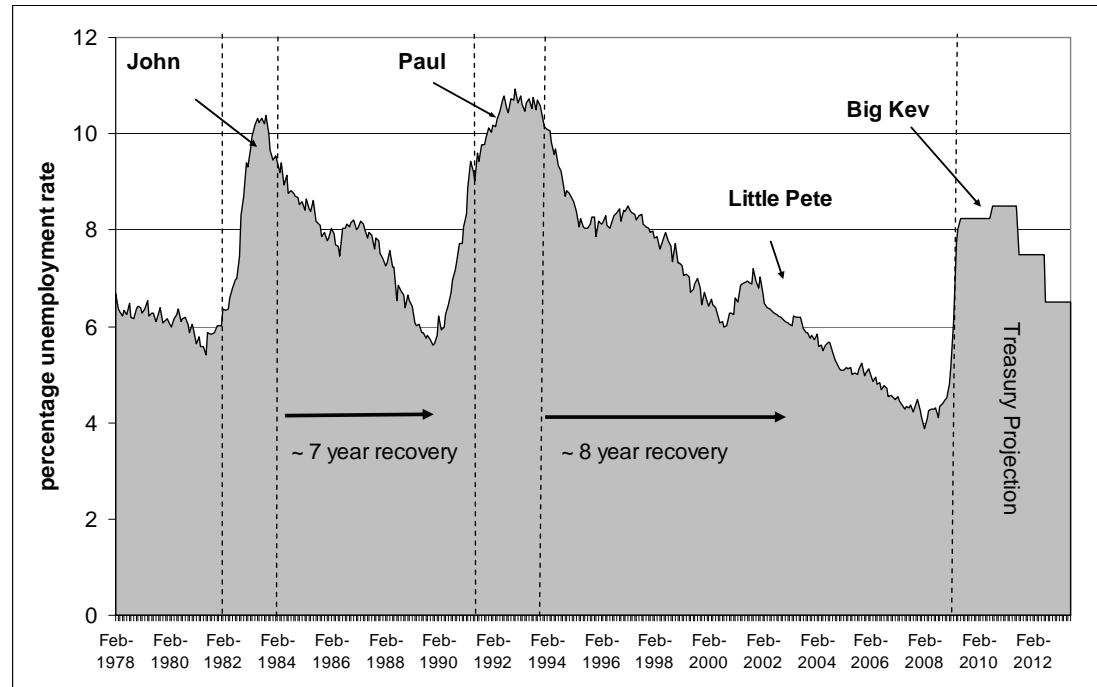


Sources: Reserve Bank of Australia and 2009-10 Treasury Budget Paper #1

As interesting as the GDP growth figures are, what really matters in a recession is the impact on employment. Figure 7.5 shows the impact of unemployment of the three recessions that have arisen since the late 1970s. So far, the outlook is for unemployment to be less severe than in the recessions of the early 1980s and 1990s. Even accounting for the fact that the level of unemployment was at an historic low prior to the present recession, the projected growth is more modest than in the two previous cases. The long period of higher than normal unemployment following the end of the technical recession reflects the extended period needed for the economy to rebuild to full capacity. On past experience, the recovery can easily extend three or four times longer than the recession itself.

As a general rule, governments tend to run fiscal deficits through recessions and well into recovery periods. This recession will not be an exception. On present projections, the government will remain in deficit for seven years and not return to surplus until 2015-16. This fully accords with the pattern exhibited in previous recessions, as shown in Figure 7.6.

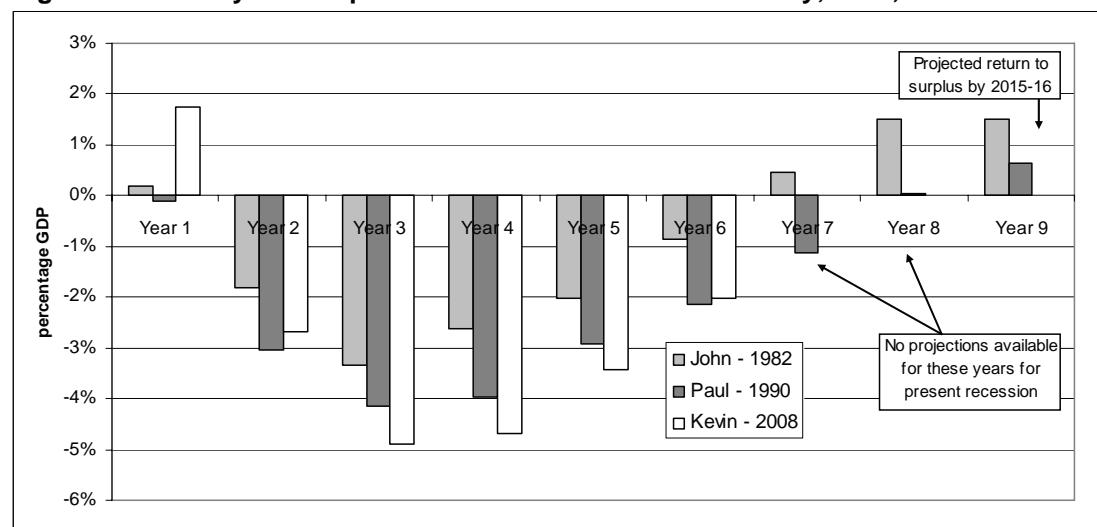
Figure 7.5: Unemployment 1978–2012



Sources: Reserve Bank of Australia and 2009-10 Treasury Budget Paper #1

Deficits endure after a recession for two reasons. Firstly because revenues remain depressed until the economy gets back to full capacity, and secondly because of increased numbers receiving unemployment benefits. In addition to the impact of these ‘automatic stabilisers’, governments usually adopt an expansionary fiscal policy during a recession to boost economic activity—either through increased spending or reduced taxation. Then, as the recovery rolls on, a progressively tighter fiscal position is adopted as government spending becomes less necessary to fuel growth. Finally, as the prospect of a surplus looms, the belt is tightened even further to deliver what has become by then a political Holy Grail: a fiscal surplus.

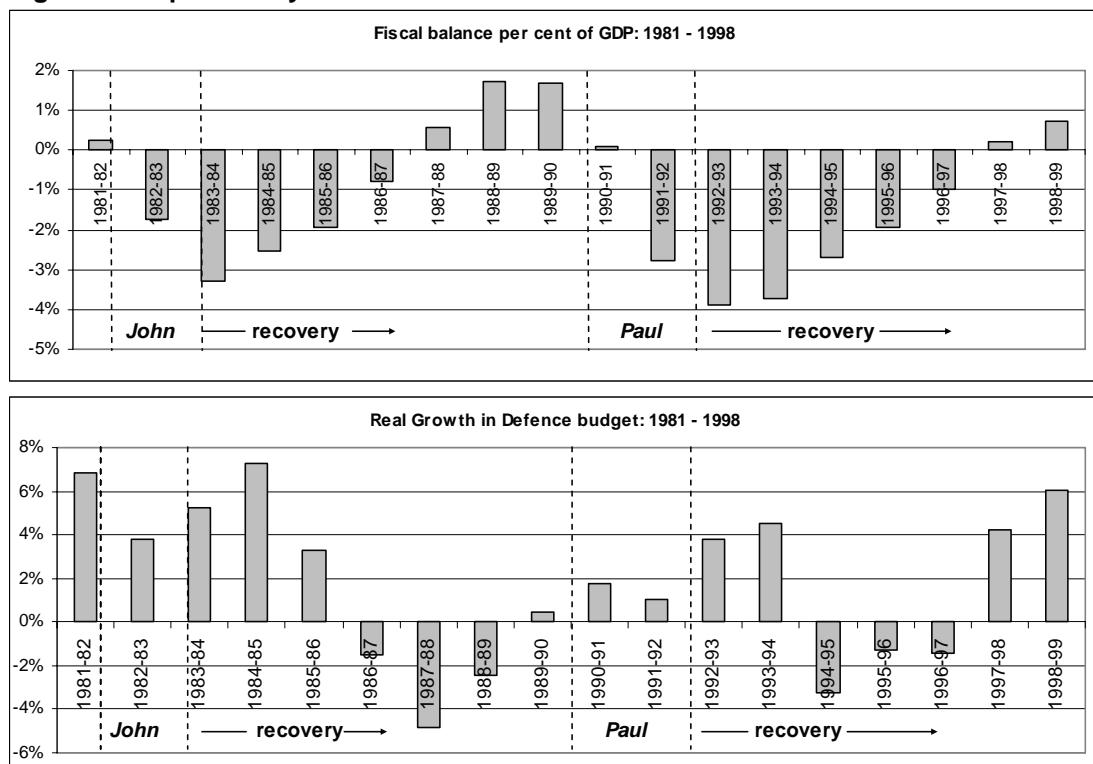
Figure 7.6: History does repeat itself – recessions and recovery; 1982, 1990 and 2008



Source: 2009-10 Budget Papers

The fiscal strategy of spending early and saving later applies as much to the defence budget as it does to other areas of government spending. While some defence spending goes overseas, the bulk of the budget is spent in Australia and therefore provides fiscal stimulus. Consistent with this, the last two recessions saw the defence budget grow during the recession and contract in the latter stages of the recovery, see Figure 7.7.

Figure 7.7: Spend early – save later



Source: Reserve Bank of Australia and DAR

Of course, without looking closely at specific decisions about defence spending around the time of the last two recessions (for which information is not readily available) it is impossible to know what other factors were at play. Unfortunately, time has prevented exploring pre-existing plans to isolate the impact of the recession.

No such impediment exists this time and there is little doubt what the government has done. Figure 7.8 shows the projected fiscal balance for the next seven years. For the last three years, we have extrapolated the trend based on historical precedents and the expectation of a return to surplus in 2015-16. Also plotted is the scale of deferred defence funding from this budget, expressed as a percentage of pre-deferral funding, and the resulting planned real growth in the Defence budget.

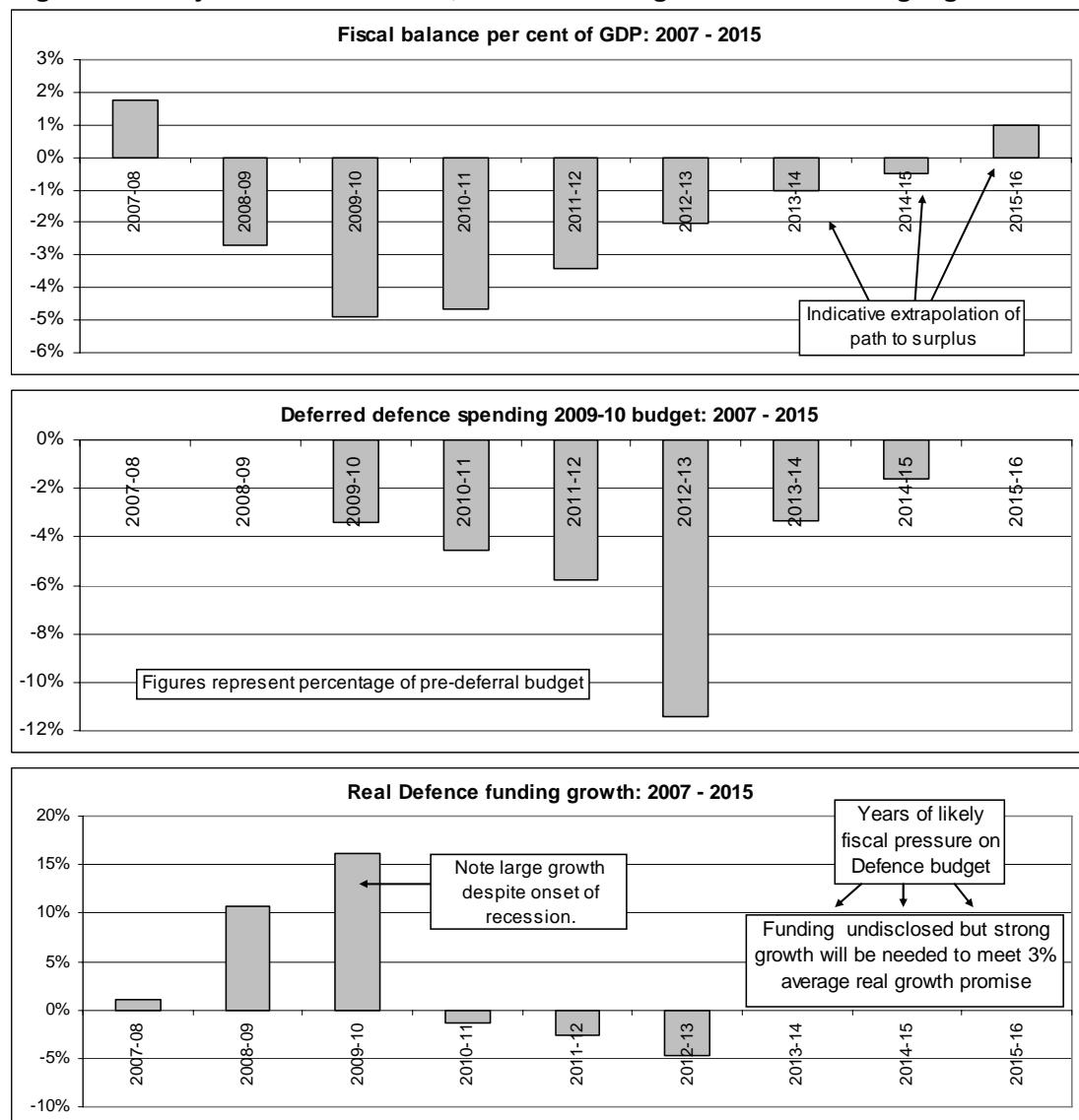
While we cannot be sure, here's what looks like has happened. For the forthcoming financial year, defence funding has only been eroded a little. This is likely the combined effect of wanting to maintain momentum in the modernisation of the force (particularly with several large acquisition projects already committed) and the fact that defence spending provides direct stimulus to the economy.

Over the following three years, the deferrals in defence spending grow larger and peak in 2012-13, the point at which the deficit has been halved. As a result, defence

spending will contract in real terms for three years in a row. None of this is exceptional—Defence is simply doing its bit to help bring the fiscal balance back into surplus.

Where things get interesting is in the period 2013-14 to 2015-16. Over this period the deferrals shrink and defence funding begins to grow again. On past experience (Figure 7.7) this might turn out to be premature. If economic circumstances erode even a little, the government of the day could be faced with the choice of maintaining a planned defence funding, or incurring an additional year of politically costly deficit spending. Even if the green shoots of recovery grow more quickly than anticipated, it might not be good news for defence. If the choice is maintaining defence funding or bringing the budget into surplus a year earlier, it is not hard to predict which way the government will move. Thus, one way or another, the period 2013 to 2016 is likely to see increased pressure on all areas of government spending, defence included.

Figure 7.8: Projected fiscal balance, defence funding deferrals and budget growth



Source: Treasury Budget Paper #1, PBS, DAR, ASPI analysis

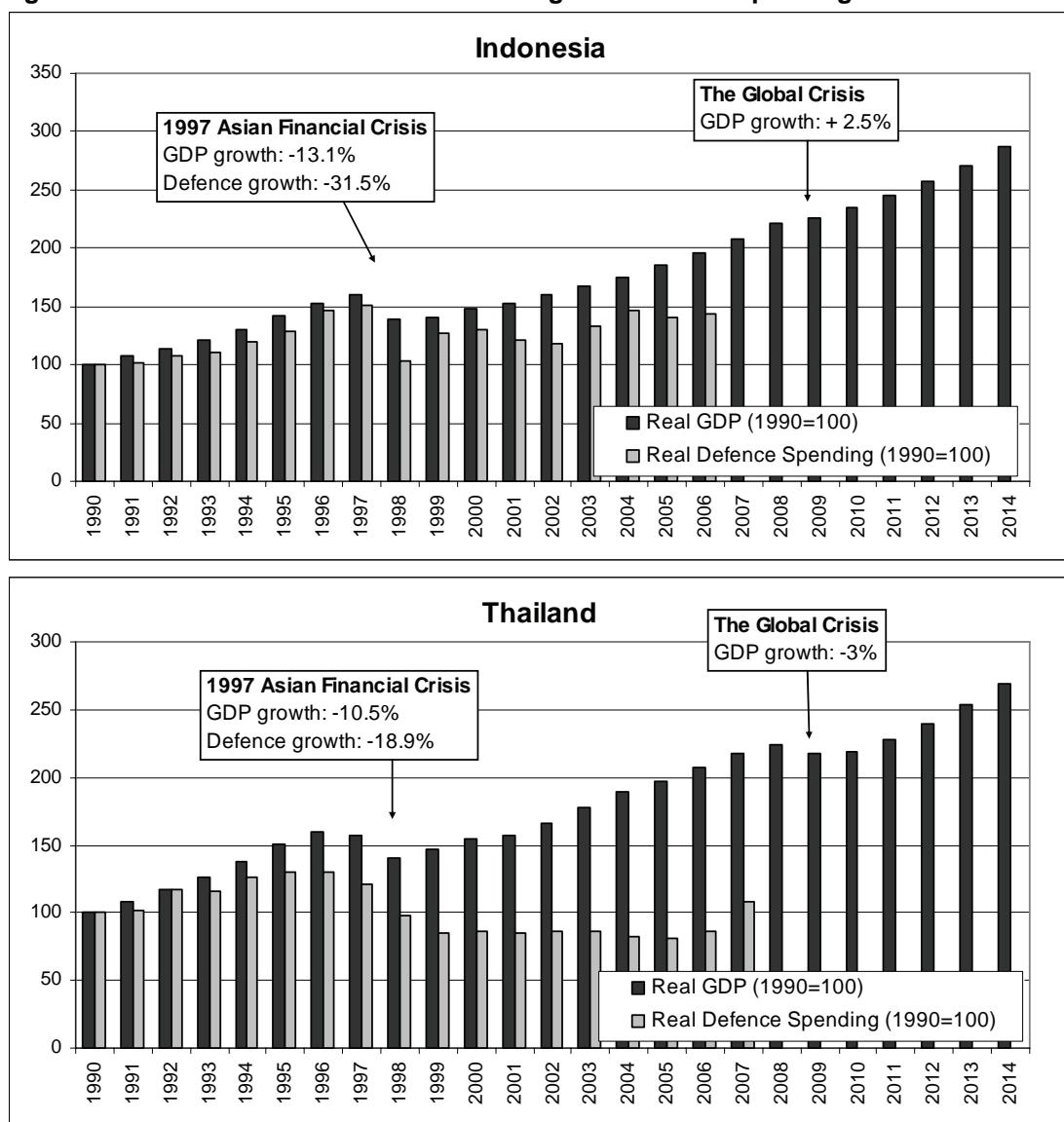
In addition to the deferral of spending, there appears to have also been a structural change in defence spending in response to the GFC. Comparing planned investment in

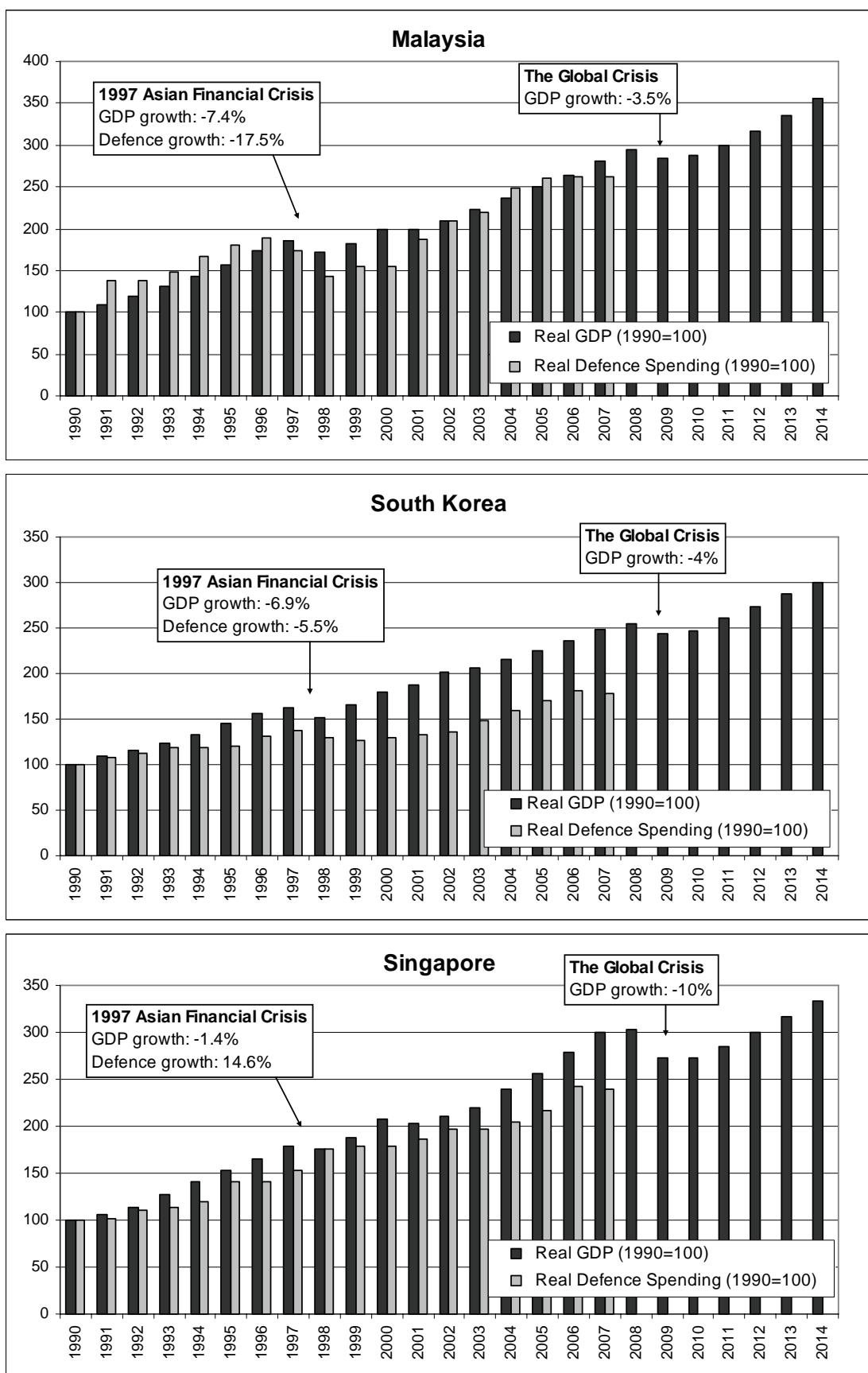
capital facilities projects for the period 2009-10 to 2011-12 prior to and after this budget reveals a 21% increase in spending from \$3.7 billion to \$4.5 billion. This is not surprising given the near-term priority placed on stimulating the economy by the government. Facilities investment, like any other infrastructure spending, has the merit of being able to soak up unused capacity at relatively short notice.

Near-term international security consequences—defence spending

Given what has happened with our own defence budget, it is possible that other countries will reduce or defer their defence spending as a result of the recession. The best guide we have of how our neighbours might behave is the 1997 Asian Financial Crisis. Figure 7.9 displays the relevant data for five countries that were hit by the 1997 crisis. It is noteworthy that the percentage reduction in defence spending in Indonesia, Thailand and Malaysia was much larger than the near-term reduction in GDP. More interesting still, in both Indonesia and Thailand defence spending has still not recovered to pre-1997 levels. Even in South Korea, it has taken a long time for defence spending to return to previous levels.

Figure 7.9: The Asian Financial Crisis and regional defence spending





Source: ASPI analysis of source data as listed at the end of Section 6 of this brief.

For most of our neighbours the GFC is not expected to have as severe impact as the 1997 crisis. Consequently, any reductions in defence spending are likely to be more moderate than in 1997. The clear exception to this is Singapore which was only lightly touched by the 1997 crisis but is slated to be hit hard by the present recession.

The extent to which a country decides to reduce, maintain or defer its defence spending as a result of the recession will depend on many factors—economic, strategic and cultural. A proper analysis of how these factors might come together for even one country is beyond the scope of this brief (except for Australia).

What can be done, however, is to collect the relevant fiscal and economic data for countries of interest and then attempt to judge the relative pressure each might be under as a result of the recession, assuming that all other things are equal.

Two factors arguably have the potential to erode a country's capacity and willingness to sustain defence spending;

- the depth of the recession it experiences
- its cumulative government debt.

Consistent with the disproportionate impact of the recession on advanced economies, the accumulation of public debt will be concentrated in developed countries over the next few years. The IMF projects that the gross public debt in advanced economies will grow from a pre-crisis level of around 78% of annual GDP to 109% in 2014. In comparison, public debt in emerging and developing economies will fall from 34% to 32% over the same period.

The latest projections from the IMF (and other sources) for the relevant economic factors appear in Table 7.2, along with recent defence spending trends. Where possible, debt has been expressed in terms of net government debt, otherwise public debt figures for 2008 from the latest *CIA Factbook* have been used.

Instances of high and growing debt (higher than 50% of GDP) and large negative growth (lower than -2% per annum) have been shaded in Table 7.2. Only six countries in our sample exhibit both characteristics; France, Germany, Japan, Singapore, the United Kingdom and the United States. With the possible exception of the United States, these countries will come under pressure to contain spending in the years ahead. The United States is a possible exception only because it owns the world's reserve currency and is thereby removed from fiscal reality, at least for the time being.

It is worth noting that the debt held by advanced economies will be more difficult to pay off than that in developing countries. Not just because advanced economies tend to owe a greater share of GDP, but also because developing economies grow two or three times faster than their advanced counterparts. Japan, in particular, faces an increasingly serious situation where its ageing population will impede growth at the same time as aged care and health costs rise in the years ahead. China, on the other hand, could erase its public debt within several years if it chose to do so.

While there is no algorithm for calculating how much a country will spend on defence given its fiscal and economic situation, it looks to be the case that the GFC will place more pressure on advanced economies to rein in defence spending than on developing

ones. Among the advanced countries, Australia is in a relatively strong position given its low debt and relatively shallow downturn.

Table 7.2: Pressures on government spending that might curtail defence spending

	Defence spending 2007		Percentage annual GDP growth		General government <u>net</u> debt as a share of annual GDP (IMF) or Public Debt as a share of annual GDP (CIA)		
	% Growth	% GDP	2007	2009	2004	2008/9	2014
Australia*	3%	1.9%	3.0%	-0.5%	-	-6%	13.8%
China	14%	1.4%	13.0%	6.5%	-	16%	-
France	-	2.4%	2.1%	-3.0%	53%	65%	80%
Germany	-	1.3%	2.5%	-5.6%	58%	71%	83%
India	7%	2.3%	9.3%	4.5%	-	**78%	-
Indonesia	2%	1.0%	6.3%	2.5%	-	30%	-
Japan	-1%	0.9%	2.4%	-6.2%	83%	104%	136%
Korea	-2%	2.7%	5.1%	-4.0%	-	33%	-
Malaysia	0.4%	2.2%	6.3%	-3.5%	-	43%	-
Netherlands	-	1.4%	3.5%	-4.8%	-	43%	-
New Zealand	4.3%	1.1%	3.2%	-2.0%	-	23%	-
Pakistan	-	3.2%	6.0%	2.5%	-	50%	-
Russia	-	1.5%	8.1%	-6.0%	-	7%	-
Singapore	-1.1%	4.4%	7.8%	-10.0%	-	114%	-
Taiwan	14.4%	2.2%	5.7%	-7.5%	-	31%	-
Thailand	-	1.4%	4.9%	-3.0%	-	42%	-
United Kingdom	-	2.3%	3.0%	-4.1%	34%	57%	83%
United States	8.1%	4.0%	2.0%	-2.8%	43%	62%	83%
Vietnam	0.7%	5.2%	8.5%	3.3%	-	39%	-

Source: International Monetary Fund *World Economic Outlook*, April 2009 and *CIA Factbook* 2009

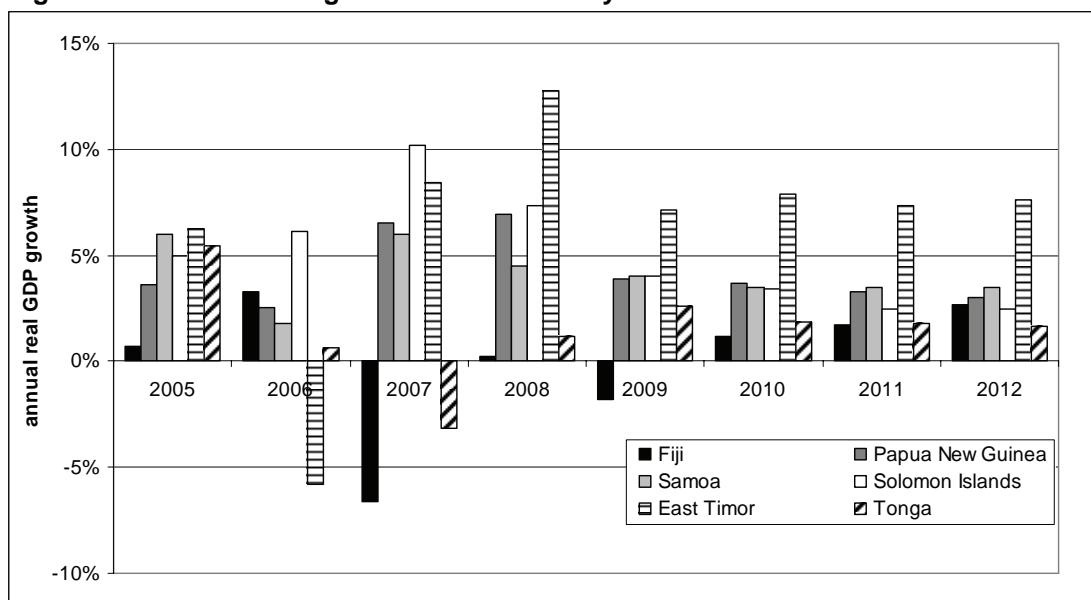
*Australian GDP figures are for 2007-08 and 2009-10, **includes state-government debt

Near-term international security consequences—instability

It is sometimes argued that emerging economies could suffer domestic unrest and political instability as a consequence of a severe recession. Indeed, the fall of the Suharto regime in Indonesia was precipitated, or at least hastened, by the 1997 Asian Financial Crisis. The complex dynamics of domestic politics makes it impossible to make a general statement about how the GFC will impact the domestic stability of countries of interest to Australia. Equally, the subject matter knowledge needed to assess the risks in any given country is beyond our expertise. Nonetheless, it is worth making the point that China and Indonesia—two countries of particular importance to Australia—appear set for relatively modest recessions. Elsewhere in Asia the situation is less optimistic, with the already politically volatile Thailand facing a 3% contraction and Taiwan a 7.5% downturn.

Among our neighbours in the Southwest Pacific the situation is somewhat more optimistic, as Figure 7.10 shows. While growth in some countries is projected to slow, only Fiji is facing an actual recession—admittedly not the country of choice given the already uncertain political situation. Paradoxically, the very thing that makes these countries poor—a lack of trade and economic integration—insulates them from the vagaries of the global economy.

Figure 7.10: Our near neighbours – not so badly affected



Source: International Monetary Fund *World Economic Outlook*, April 2009

Stepping back and looking at the GFC in an historical context, there is an important point to make. On present projections, the Great Recession, as it has come to be known, will in no way be comparable with the Great Depression that ravaged much of the world in the 1930s. Aside from lasting close to a decade, the Great Depression saw unemployment rise to around 30% in the United States and Australia. National output dropped by a similar amount in both countries. Thus, any suggestion that the present downturn has the potential to drive political changes like the rise of German fascism and the fall of the Weimar Republic in the 1930s is somewhat premature.

The long-term geopolitical impact of the GFC

When we look back at the GFC in ten years' time, what will we identify as its enduring geopolitical impacts? With a myriad of possible futures between now and then, this is a difficult question. Yet, on the basis of what we know now, there are a couple of points to be made.

To start with, it is now accepted that emerging economies like China, India and Brazil will have better access to international economic forums. In fact, the G-20 has emerged as the default for discussing the response to the GFC, thereby considerably expanding the franchise beyond the traditional G-8. At the same time, it has become accepted that the cross-Atlantic hegemony over the World Bank and IMF will be loosened to accommodate increased voting rights for China.

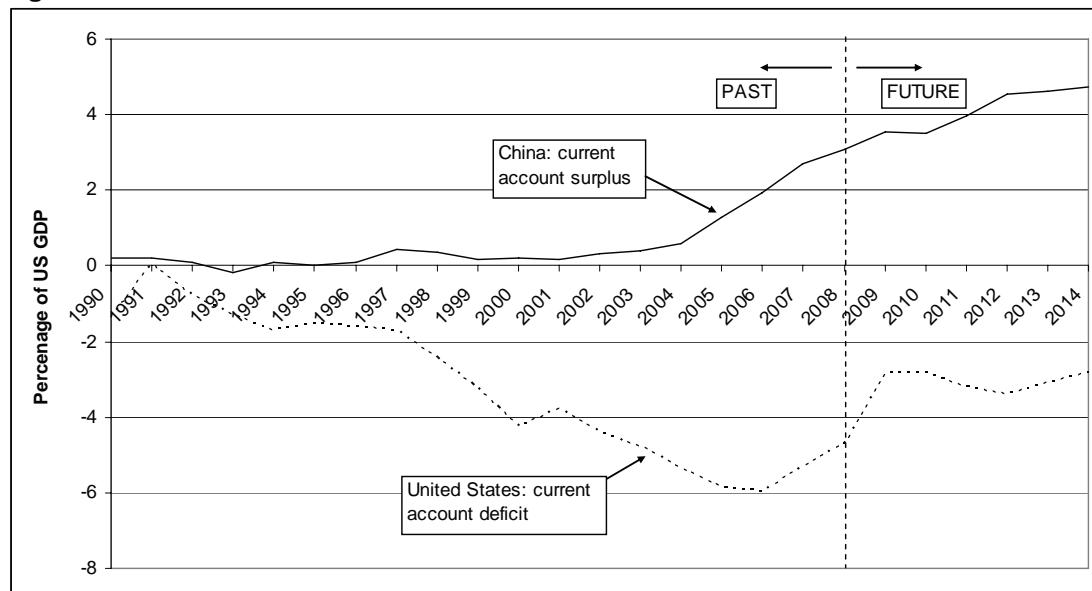
None of this is earth-shattering. International economic forums are useful venues for forging consensus and cooperation—but that's about it. They produce anodyne

communiqués rather than binding agreements. For better or worse, countries make economic decisions in their sovereign interest and with the response of their citizenry in mind. A move to a broader representation in economic forums is unlikely to be harmful and, in the case of emerging countries like China and India, is a natural step towards recognising their developing economic weight.

Similarly for the World Bank and IMF, with China contributing hard currency to boost the money available to ameliorate the impact of the GFC, it is difficult to see how it can be denied a greater say in its dispensation and in development lending more broadly. That said, the work of the World Bank and IMF is more technocratic than overtly political. Given that China has signed up to the conventional liberal economic model that has delivered prosperity to itself and others, there are unlikely to be too many cases of disagreement.

On a more concrete level, the GFC has accelerated the shift in relative economic weight from the established industrialised countries to the emerging powers. This is not simply because of a year or two of relatively slower growth. Rather, it is because some developed countries will be left with exceedingly high levels of debt by the crisis. In the United States, Japan and United Kingdom, the preceding boom and bust of the GFC will have increased their debt by 40 to 50 percentage points of national GDP. As a result, over a single decade, debt levels will have risen by amounts that previously took several decades to accumulate. This will greatly complicate the already appreciable problems that ageing will impose in the decades ahead, especially in Japan.

Figure 7.11: Current account balance – US and China



Source: International Monetary Fund *World Economic Outlook*, April 2009

Related to the question of debt are the international financial imbalances that accumulated rapidly in the years building up to the crisis. Specifically, for more than a decade, the United States (the economy as a whole not just its government) has been borrowing money—lots of money. As Figure 7.11 shows, the US current account deficit deteriorated from around 2% in the late 1990s to 6% in 2006. Borrowings

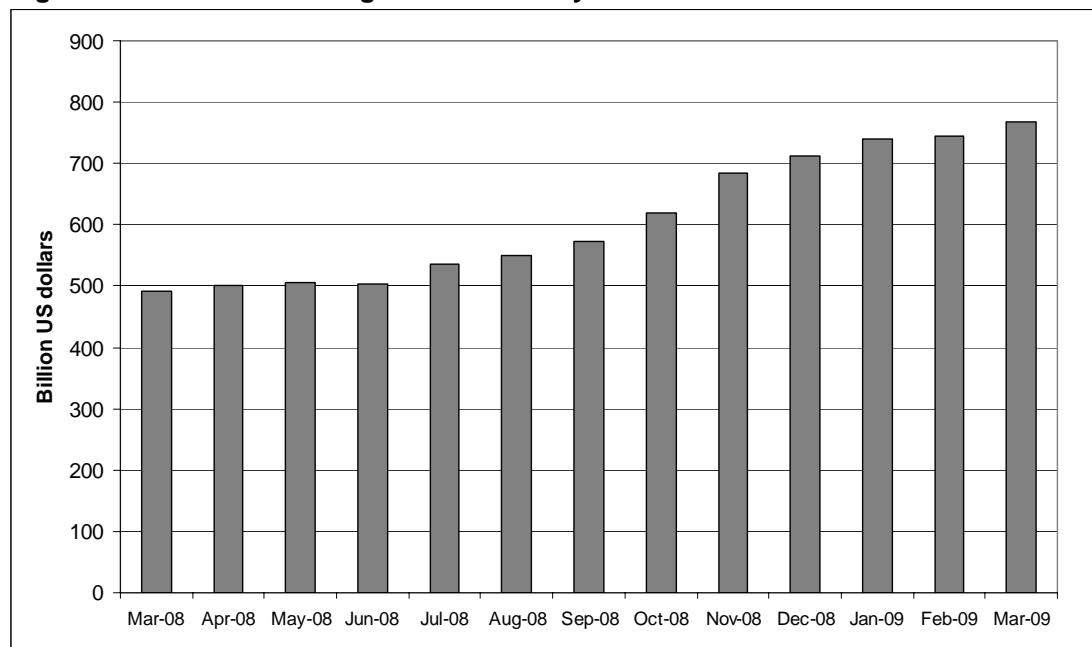
came from a variety of sources but recently have included a number of oil producing countries and, from 2004 onwards, China.

Explanations and perspectives of the ‘Great Imbalance’ varied greatly. Some argued that individuals and firms in the United States were borrowing money to build productive capacity and higher future productivity. Under this explanation, thousands of robust individual business cases underpinned the current account deficit and there was nothing to worry about. Others took a more pessimistic view and said that the United States was clearly living beyond its means and that the unsustainable arrangement would have to end—perhaps catastrophically through a collapse of the US dollar.

In different respects, we now know that both views were wrong. The optimists were wrong because much of the investment in the United States was less than well thought out. In fact, at least several hundred billion dollars worth is now labelled as toxic. The pessimists were wrong in the sense that the US dollar has not just weathered the storm of the GFC; it has been strengthened by it—at least so far. And while the US current account deficit is projected to moderate (Figure 7.11) in the years ahead, it is not going to go away anytime soon.

The US dollar rose in value early in the crisis as investors sought safety in it as the world’s reserve currency. China strongly backed the US dollar from the middle of 2008 onwards, as Figure 7.12 shows. In a sense, the Chinese and other creditors of the US are caught in a dollar trap—they can either support the US dollar, or see their assets depreciate with the value of the dollar.

Figure 7.12: Chinese holdings of US Treasury bonds



Source: US Treasury

Thus, rather than destabilise the unsustainable trans-Pacific financial imbalance, the GFC revealed just how closely interlinked the financial and economic fate of countries have become. If anything, the increased borrowing by developed countries during the crisis has strengthened that interdependence.

What happens next is unclear. The pessimists are right on one account—endless borrowing cannot be sustained forever. Eventually, some combination of reduced borrowing and adjusted exchange rates will have to emerge.

So what does any of this have to do with geopolitics? There are two areas where the persistence of the imbalance could be of consequence.

Firstly, with such a high level of interdependence, it is not hard to conceive of circumstances where tensions mount because one country takes action in its own economic interest to the detriment of another. Protectionism, exchange rate manipulation and deliberate inflation might all fall into this category.

Secondly, it has been argued that the present scale and pattern of US indebtedness makes them vulnerable in a crisis with a lending nation like China. All it would require is for the lender to judge that their geopolitical interests outweigh their own financial loss from undermining the US dollar.

It is difficult to judge how seriously to take these risks. If the GFC has shown us anything, it is that interdependence has, so far, given countries a strong incentive to cooperate for the common good.

Further reading:

Brad W. Setser, *Sovereign Wealth and Sovereign Power*, Council of Foreign Relations Special Report No 37, September 2008.

Steven Dunaway, *Global Imbalances and the Financial Crisis*, Council of Foreign Relations Special Report No 44, March 2009.

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This chapter was edited by Andrew Davies, the Director of ASPI's Operations and Capability Program.

Electronic warfare self-protection for ADF aircraft – an overview

Gregor Ferguson

On 31 March this year, *The Australian* published a front-page article by associate editor Cameron Stewart whose headline summarised the story neatly: ‘Military not ready for war as fighter jets, choppers and submarines unfit for frontline’.

The article listed a number of ADF platforms which cannot be sent into action ‘at short notice against any enemy with modern air defence systems or anti-ship missiles.’ It also listed others which, for a variety of reasons, were simply not prepared for combat against a modern, well-equipped and proficient enemy. The list included the RAAF’s Hornet fighters and F-111C strike aircraft; the Navy’s frigates and submarines (the latter suffering a severe manpower shortage); and the Army’s Black Hawk helicopters and M113 armoured personnel carriers.

The Minister for Defence, Joel Fitzgibbon, was quoted as saying: ‘If we do see a strategic and tactical justification for sending Black Hawks to Afghanistan tomorrow, we would be unable to do so as they lack the electronic warfare self-protection they require. We spend a lot of time thinking and talking about important capability as we look far out into the future, but we seem to spend much less time talking about the capability we need to do the things we do right now and on a regular basis.’

Stewart’s article blames the situation on a lingering tendency within Defence and the ADF to invest in the future force—that is, in new equipment and platforms—and not in maintaining the readiness of the equipment currently in service. The result is when contingencies arise at short notice the ADF has few available options.

While Stewart’s article was essentially accurate, it was a snapshot which failed to include the investment currently under way to overcome the ADF’s current shortfall in operational readiness. However, it must be said that much of the recent investment in Electronic Warfare (EW) and other force protection measures has been in the form of short-notice Rapid Acquisition Projects (RAPs) required to rectify the shortcomings and delays inherent in Defence’s own internal capability development approval and decision-making processes.

...much of the recent investment in Electronic Warfare (EW) and other force protection measures has been ... required to rectify the shortcomings and delays inherent in Defence’s own internal capability development approval and decision-making processes.

In particular, a two-year hiatus in a critical EW project due to funding difficulties emerging from the 2000 Defence White Paper delayed essential upgrades to ADF helicopters and transport aircraft necessary for them to operate in theatres such as Iraq and Afghanistan.

This is a festering issue which the 2009 Defence White Paper addresses explicitly in Paragraph 8.62: ‘While mission-specific capability enhancements will be applied where necessary, as a capability development principle the ADF will acquire fully developed capabilities which are fully deployable and effective within readiness warning times.’ Paragraph 8.64 continues: ‘The ADF must be able to protect itself

against the range of existing and evolving threats, particularly as the proliferation of threats is unlikely to abate. Continued investment in lower signatures and stealth for our capabilities and systems, force protection, countermeasures, protective security and systems redundancy will be required.’ And Paragraph 9.92 foreshadows a more systematic approach to the development and sustainment of platform and force-level EW.

Ready or not?

Readiness can be defined broadly as the ability to send people and equipment into action at short notice without requiring significant additional training, upgrading of equipment (or rapid acquisition of new equipment) or purchasing of buffer stocks of spares and ammunition to maintain a credible rate of effort. This is obviously a highly contextual thing: no defence force can predict every conceivable threat; nor can it be kept on a permanent war footing, except when confronted by an explicit and persistent threat, and then only at a very high cost.

Electronic Warfare is one of the critical components of readiness, especially for air and maritime platforms. While good equipment, training and tactics are essential for dealing with modern threats, so also is good EW, and especially EW Self-Protection (EWSP). All else being equal, the quality of a platform’s EW equipment is likely to be a key determinant of whether or not it can defeat an adversary or survive an engagement.

This is one of the factors behind Minister Fitzgibbon’s February 2009 announcement that twelve of the twenty-four Super Hornets the RAAF ordered in 2007 will be wired to accommodate the offensive and defensive EW equipment installed on the US Navy’s EA-18G *Growler* electronic attack aircraft. Without exception, every US military campaign has employed the *Growler*’s predecessors—the veteran EA-6B *Prowler* and the now-retired EF-111A *Raven*—to suppress enemy air defences, paving the way for friendly strike aircraft in high-threat environments.

The clear implication from Mr Fitzgibbon’s announcement is that the government wants the RAAF to be able to deploy air defence and strike aircraft—and also transport aircraft and helicopters—in much higher threat environments than is currently the case. Indeed there has been much recent investment in EWSP upgrades to many ADF aircraft for this very purpose.

...the government wants the RAAF to be able to deploy [its aircraft] in much higher threat environments than is currently the case.

So what does EWSP actually do? The engagement cycle for most air-to-air, surface-to-air and anti-ship weapons requires the use of some kind of sensor—typically radar, optical, infra red (IR) or Electro-Optical (EO)—to detect, locate and identify a target, and then a communications system to transfer target data to a gun or missile system which then engages the target. The cycle, also often referred to as the ‘kill chain’, must remain unbroken right up to the point of target impact. The thrust of EWSP is to break at least one link in that kill chain: by warning of the presence of a threat or simply providing situational awareness to guide evasive manoeuvres, by jamming radars and data links, by dazzling or blinding EO, IR and optical sensors and

tracking systems, or by using decoys.

However, radars and IR sensors and missile seeker heads, and the software in their processing systems, are becoming increasingly sophisticated and resistant to traditional jamming techniques and counter-measures. Modern low probability of intercept (LPI) radars are particularly hard to detect; modern weapons have greater performance and are relatively less vulnerable to an adversary's counter-measures. And stealthy or semi-stealthy aircraft and missiles are able to get closer to their targets before being detected or having to switch on easily-detectable fire control or target tracking radars, which means that reaction times are increasingly short.

EWSP confers survivability and, increasingly, situational awareness. The introduction of low-observable, or 'stealth', technology in aircraft such as the *Super Hornet* or F-35A *Joint Strike Fighter* adds to the effectiveness of EWSP systems. Stealth doesn't make an aircraft or ship invisible but it makes it more difficult for an enemy to build the kill chain, and it makes one's own counter-measures relatively more effective. A few percentage points of difference in a platform's IR or radar 'signature' can be as valuable as total invisibility under some circumstances.

Hardware and software

The main components of an EWSP system are (i) a sensor capable of detecting an incoming threat (or its surveillance, tracking or data link systems), calculating its bearing accurately and identifying its type, (ii) a counter-measures system of some kind, such as a jammer, decoys or a laser and (iii) an EW suite controller which can assess the incoming threat, alert an operator and then either recommend or initiate counter-measures.

There are variations: a Radar Warning Receiver (RWR) detects threat radars and their type and mode of operation and provides an indication of their direction. Electronic Support Measures (ESM) do the same thing with much greater accuracy—they provide target-quality directional data as well as performing an important intelligence-gathering function. Missile Approach Warners (MAW) can be radars, but these are more commonly IR or Ultra Violet (UV) sensors designed to detect the plume of a missile's rocket motor.

Effectors (commonly called jammers) can consist of radar (RF, or radio frequency) emitters, which transmit a blindingly powerful radar signal; IR and UV jammers, which do the same at their respective wavelengths; directed infra-red countermeasure (DIRCM) lasers mounted in turrets which disrupt the operation of the IR homing heads of so-called heat-seeking missiles; and decoys such as 'chaff' and flares to confuse radar and IR sensors, respectively, and seduce missiles away from their intended targets.

Undoubtedly Australia's most significant contribution to this area of technology has been the Nulka active missile decoy, a hovering rocket launched from a ship when an incoming radar-guided missile is detected; this moves gradually away from the ship transmitting back to the missile a signal which seduces it away from its intended target. Conceived originally by Defence Science & Technology Organisation (DSTO), Nulka is probably the most effective decoy of its kind in the world and now

equips Australian, US and Canadian warships and is considered an extremely effective anti-ship missile defence EWSP system.

Retrofitting a new EW system to an existing platform isn't easy. Because of the vagaries of electromagnetism, EW equipment is extremely sensitive to seemingly minor factors such as cable lengths between components, the location of antennas and decoy dispensers, and interference from other transmitters on the platform itself. Fitting and integrating an effective EW system is therefore complex, takes time and needs lots of verification testing.

Furthermore, the need to maintain and update 'libraries' of threats—the frequencies, wavelengths, waveforms and modes of operation of a potential enemy's radar signals, for example—and to maintain and update suite controller and EW processor software is a painstaking, never-ending task once the equipment is in service. Much EW equipment bought from overseas, particularly the US, comes with threat libraries and operating software pre-installed. In many cases this cannot be altered or upgraded in-country. Upgrades and enhancements must come from the original supplier (or its government), without full transparency and little understanding on the customer's part of how the equipment works and what its limitations are.

This is a critical issue for most defence forces: the ability to enhance, upgrade and re-program EW equipment, often at short notice to meet an unexpected threat, is a vital component of national self-reliance. This problem exists to a greater or lesser degree right across the ADF and, since the early-1990s, elements of the ADF and Defence Materiel Organisation (DMO) have devoted huge effort to creating a common 'family' of EW equipment aircraft and helicopters that is capable of being supported, upgraded and enhanced entirely in-country.

However, many of the new platforms the ADF has acquired recently come equipped as standard with an effective EW suite; in most cases, and for very good reasons, Defence doesn't tinker with it—the C-17A *Globemaster* transport aircraft, Eurocopter *Tiger* and MRH-90 helicopters and F/A-18F *Super Hornet* fighter are good examples.

In other cases, such as the ANZAC frigate and *Collins* Class submarine, Defence was forced to choose an EW suite for an all-new platform. And in many cases platforms were ordered without any EW equipment at all, or had become so old the original suite was useless. Typical examples are the *Black Hawk* and *Chinook* helicopters and the C-130H and –J *Hercules* transport aircraft, the original P-3C *Orion* and the *Seahawk* helicopter, which were delivered without EW equipment; and the F-111C fighter-bomber whose original EW equipment was utterly obsolete and required a major upgrade.

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A number of *Black Hawks* got their first EWSP upgrade in the early-1990s under Project Gemini to operate in Cambodia. Under Project Apollo, four C-130Hs were fitted with a US EWSP suite sourced off the shelf (OTS) to operate in Somalia, later upgraded in the late 1990s. RAN *Seahawks* got a minor upgrade in 1990-91 to operate in the Gulf and the F-111s got an improved RWR and a new radar jamming pod

during the late 1990s.

The diversity of ADF platforms, EW equipment and potential threats is bewildering; the task of keeping this fragmented inventory of equipment combat-ready is daunting, and falls on the DSTO and particularly a specialist ADF unit, the Adelaide-based Joint Electronic Warfare Operational Support Unit (JEWOSU), which in turn forms part of the RAAF's Aerospace Operational Support Group (AOSG). And the task has been complicated, and made more urgent, over the past two decades by the increase in the ADF's operational tempo and the emergence of new threats: more capable sensors, command and control systems and missiles; and by the proliferation of MANPADS—man-portable air defence systems such as the ubiquitous Russian SA-7 'Grail' shoulder-launched IR-guided surface-air missile in the hands of terrorist groups and insurgents.

An integrated approach to acquiring EWSP equipment would mean the ADF's inventory could be rationalised, the sustainment and development efforts of JEWOSU and DSTO focused to better effect, and the burden of this technical and configuration management 'overhead' reduced significantly.

Airborne EW

Project Echidna, AIR 5416, was established in 1998 to realise this vision. It included related self-protection measures such as acquiring ballistic protection for *Black Hawk* and *Sea King* helicopters, but the key thrust was to develop a common family of EWSP equipment for Army and Navy helicopters and the RAAF's F-111s and transport aircraft. It also included the fitting of the all-new Australian-developed RWR, the ALR-2002 to these platforms. However, it was one of three projects which were terminated or suspended due to budget difficulties in 2000 arising from the Defence White Paper deliberations (the others were the *Caribou* replacement project and the Air Combat Training System).

Project Echidna was kept alive by 'eye-dropper' funding and not re-approved until 2003, with a renewed (and more constrained) focus on acquiring a family of EWSP systems for the *Black Hawk*, *Chinook* and C-130H *Hercules* fleets. In 2005, a quick partial upgrade enabled the Chinooks to operate in Afghanistan; implementing the full upgrade will take longer because the helicopters simply aren't available to be upgraded and then tested properly.

Similarly, an interim *Black Hawk* EWSP upgrade is already under way: five of 12 aircraft have been fitted with a MAWS and CMDS; approval for the full upgrade, which includes a RWR, extra CMDS and an integrated EW suite controller and display, is contingent on a final decision to be made during 2009.

Partly as a result of these delays, and partly also as a result of risk-aversion within Capability Development Group and the DMO, various platform Systems Project Offices (SPO) have tended to acquire platforms already equipped with an effective and well-integrated EWSP suite, as Military Off The Shelf (MOTS) EW systems with relatively low integration risk. And partly for this reason, Defence chose in 2006 not to acquire the indigenous and still-developmental ALR-2002 RWR for its *Hornet* upgrade project, preferring instead the Raytheon ALR-67(V)3 which also equips the

Super Hornet; however, the Echidna program delays had a knock-on effect on the *Hornet* upgrade, delaying introduction of this enhanced EWSP capability.

The RAAF's Hornets will receive an EWSP upgrade under Phase 2.3 of the Hornet Upgrade program. Some 16 aircraft have already been fitted with the ALR-67(V)3 to meet operational demands; the full fleet upgrade will be implemented in 2009-10. This MOTS approach avoids the risk of schedule and cost slippage due to development and system integration difficulties, but perpetuates a diverse and fragmented EWSP inventory within the ADF and an increased sustainment burden.

Therefore the decision to integrate the European-made AAR-60 MAWS on the RAAF's AP-3Cs *Orions* instead of an off the shelf US product represents a victory for common sense. It's probably the best product of its type on the market, and is also being fitted to the *Black Hawk*, *Chinook*, *Tiger* and MRH-90 helicopters. The 2009 Defence White Paper announced the imminent retirement of the C-130Hs and the acquisition of two extra J-model *Hercules* along with 10 Light Tactical Airlifters to replace the RAAF's obsolescent *Caribous*. These new aircraft will also be equipped at delivery with effective EWSP suites.

Maritime EW

The RAN has five major classes of combatants: its *Collins* Class submarines; FFG and ANZAC frigates; *Huon*-class minehunters; and *Armidale* class patrol boats. Over the next five years it will also introduce the first of its new *Hobart* class air warfare destroyers and *Canberra* class amphibious landing ships (LHD).

While the *Huons* and *Armidales* are equipped with substantially the same PRISM lightweight ESM system, the current EW systems on the *Collins*, FFGs and ANZACs are all completely different from each other. The EW systems being considered for the AWDs and LHDs may be different again. The original system on the FFGs has been replaced as part of the FFG Upgrade project, Sea 1390, and is now said to be compliant with the contracted requirements, but only after lengthy integration delays which have contributed to the FFGs' recent absence from operations in the Gulf.

The ANZACs were always a compromise between affordability and capability, with a bias towards the former. Its ESM system is due for replacement next year as part of the ongoing ANZAC Anti-Ship Missile Defence (ASMD) Upgrade, Project Sea 1448. However, it's considered effective enough that these ships can deploy to the Gulf with confidence.

Given its crucial surveillance and intelligence-gathering role there is a strong argument for treating the *Collins* Class submarines as a special case, with a unique EW suite. Similarly, with so much already invested in acquiring and integrating their new C-Pearl ESM system, there is a case for treating the upgraded FFGs as a unique fleet, especially as their life of type is now less than 10 years.

But there exists a once in a generation opportunity to acquire a common maritime EW family for the ANZAC frigates, the AWDs and the LHDs, which will comprise the bulk of the surface combatant fleet from the middle of next decade. The AWD Alliance is already considering tenders for the AWD equipment; there is potential for

the system to be acquired also for the ANZACs and LHDs, so providing an effective, economical fleet-wide maritime EW and ESM capability. However, the first AWD won't enter service until 2014. The first LHD is due to enter service in 2013 and the first ANZAC with an upgraded ESM system won't rejoin the fleet until at least 2012. So a significant step change in Australia's maritime EW capabilities is at least three years away.

Future equipment

Two decades ago the ADF was expected to be able to fight a more or less conventional war against a regional adversary judged to be qualitatively inferior in both equipment and training. The benchmark for preparedness was regional capabilities, not stated intentions. This approach reflected the view that an ADF configured and prepared for a direct attack on Australia should be capable of contributing niche forces to coalition operations further afield.

In fact, Australia's ability to contribute meaningfully to US-led coalitions in Iraq (in 1990, 1997 and 2003) and Afghanistan (2001) was very low: except for a few specially modified examples, most ADF aircraft (helicopters in particular) lacked EWSP and were incapable of operating alongside US and other coalition forces in medium-high threat environments.

While conventional conflict within our broad region must be considered an unlikely prospect, four decades of economic prosperity and growth have seen the spread of modern combat aircraft, ships, submarines, armoured vehicles and guided weapons throughout the region. And the so-called 'democratisation of lethality' means small non-state groups are able to deploy lethal and effective weapons, ranging from improvised explosive devices (IEDs) to the ubiquitous SA-7. The ADF today could at any time face a short-notice requirement to confront a smart, well-armed terrorist or insurgent group able to inflict serious casualties on unprepared defence forces.

The minimum threshold for survivability and combat effectiveness is higher than hitherto. In 2008 the Chief of Air Force decreed that, in future, all RAAF frontline combat, transport and surveillance aircraft must be equipped, and their crews trained, to operate 'in harm's way'. Within two years there won't be single ADF air platform that isn't capable of operating in any theatre where Australian troops are currently deployed. And with an eye to emerging conventional and non-state threats, the DMO and DSTO are working on enhancements to RWRs and DIRCM systems as well as new measures such as IR suppressors for engine exhaust gasses.

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This is partly a function of emerging threats, partly a growing intolerance politically and within the broader community to operational risk, and partly a function of the resulting growth in the capabilities of Australia's principal allies. Interoperability with them in a balanced force now demands an increased level of ADF self-protection and survivability as well as outright combat capability.

The ADF's investment since the late-1990s in EW and EWSP upgrades for existing

ships, aircraft and helicopters is designed to hone its somewhat dulled edge. The planned purchase of F-35A Lightning II *Joint Strike Fighters*, probable conversion of some *Super Hornets* into *Growler* EA aircraft, and the stated intent to acquire modern and effective EW suites for its new AWDs and LHDs suggests the government also wants a heavier punch and longer reach.

This isn't necessarily a response to a heightened threat; it enables the ADF to provide the government with better and more flexible military options and greater control of operational risks when responding to contingencies in the future. The question is whether or not it maintains a credible level of investment to ensure the EW component of its restored combat edge remains sufficiently sharp in the years ahead.

To summarise, the ADF hasn't been blind to the need for effective EWSP right across the three services. But achieving the necessary capabilities has taken longer than it should have done. White Paper promises notwithstanding, it remains to be seen how well the ADF will integrate, maintain and sustain its platform and force-level EW systems once they are in service.

TABLE 1. – Current and planned EW Equipment on major ADF platforms

PLATFORM	EW EQUIPMENT	IN SERVICE DATE
F-111C	ALR-62V5/6 RWR EL/L-8222 RF jammer ALQ-213(V) EWMS ALE-47 CMDS	2000 2002 2002 2000
F/A-18A/B Hornet	ALR-67(V)3 RWR ALQ-126 RF jammer EL/L-8222 RF jammer BOL CMDS ALE-47 CMDS	2008-2010 1985 2010 2010 2003
F/A-18F Super Hornet	IDECM – Integrated Defensive Counter Measures System comprising: ALE-47 CMDS ALR-67(V)3 RWR ALE-55 towed decoy ALQ-214 RF jammer	2010 Note: The RAAF plans to shadow the US Navy's standard configuration, including regular upgrades
F-35A Lightning II	Fully integrated EW Suite, including Distributed Aperture System (DAS) and RWR	2014?
Boeing 737 Wedgetail	ALR-2001 ESM	2010?

	Vicon 78 CMDS LAIRCM	2010? 2010?
A330 MRTT	LAIRCM	2010 2010
AP-3C Orion	ALR-2001 ESM AAR-60 MAW ALE-47 CMDS	1995 2006 2006
C-130H Hercules	AAR-47(V)2 MAWS ALE-47 CMDS SPS-1000V5ARWR	2006 2006 2006
C-130J Hercules	ALR-56M RWR (pending DCP) AAR-47 MAW ALE-47 CMDS LAIRCM (pending DCP)	2011/12 2007 2007 2011/12
C-17A Globemaster III	AAR-54 MAW AAQ-24 DIRCM	2008 2008
S-70A Black Hawk	AAR-60 MAW Vicon 78 CMDS ALR-2002 RWR and SIIDAS EW Controller (pending go ahead decision)	2009 2009 2010
CH-47D Chinook	AAR-60 MAW ALE-47 CMDS ALR-2002 and SIIDAS EW Controller	2007 2007 TBD
Tiger ARH	AAR-60 MAW SAPHIR-M CMDS TWE RWR	2009 2009 2009
MRH90	AAR-60 MAW TBD CMDS TWE RWR	2009 2009 – not yet selected 2009
S-70B Seahawk	AES-210 ESM AAR-54 MW ALE-47 CMDS LWS-20 Laser Warner	2009 2009 2009 1990
Sea King	N/A	N/A
Collins Class submarine	Argo AR 740 RWR EDO ES-5600 ESM	
FFG Frigate	C-Pearl ESM Nulka AMD	2009 2005
ANZAC Class frigate	Sceptre A ESM	2001 – to be upgraded 2010

	PST-1720 Comms ESM Nulka AMD	1995 2005
Hobart Class AWD	ESM/EA – TBD Nulka AMD	2014 2014
Canberra Class LHD	ESM/EA – TBD Nulka AMD	2012 2012
Huon Class Minehunter	Prism ESM	1998
Armidale Class patrol boat	Prism ESM	2007

Acronyms:

AMD	Active Missile Decoy (Nulka)
AWD	Air Warfare Destroyer
CMDS	Counter-Measures Dispensing System
DAS	Distributed Aperture System (threat warning)
DIRCM	Directed IR Counter Measures (laser)
EA	Electronic Attack (including jamming)
ESM	Electronic Support Measures (situational awareness and intelligence-gathering)
EWMS	EW Management System ('Suite Controller')
IR	Infra Red
LAIRCM	Large Aircraft IR Counter Measures (includes AAQ-24 and AAR-54 DIRCM)
LHD	Landing platform Helicopter Dock (amphibious landing ship)
MAWS	Missile Approach Warner System
MRH	Multi-Role Helicopter
MRTT	Multi-Role Tanker Transport
RF	Radio Frequency (refers to radar or radio)
RWR	Radar Warning Receiver
TBD	To be determined
UV	Ultra Violet

Improving ASLAV survivability

Tom Muir

Under project, LAND 112, the Cavalry's ubiquitous and versatile Australian Light Armoured vehicle (ASLAV) was acquired in two main tranches. Delivery of the first 113 commenced in 1995 followed by a further 144, delivered through 2004.

The earlier ASLAVs were upgraded to the same build standard as the later vehicles. This included enhancements to offensive capabilities and crew protection, new electric turret drives, improved thermal sights, an integrated laser range finder, second generation drive line and new suspension components. In addition, the developmental stage of the Surveillance project is progressing with a prototype Multi-Spectral Surveillance Suite being tested in Australia from late 2008. An advanced gunnery simulator, the Crew Procedural Trainer, is in service with Army.

Since 2005 sixty-two ASLAVs have been deployed to the Middle East, and most of them have been fitted with the Kongsberg Protector Remote Weapon Stations (RWS) mounting the 12.7mm heavy machine gun, which allow weapons to be fired from within the safety of the vehicle. Australia bought 59 Protectors for A\$17.9 million. The vehicles also received improved protection, through being fitted with bar armour and internal spall liners to better withstand blast, small-arms hits and fragmentation.

This 'rapid acquisition' work had to be done very quickly and under difficult circumstances, with much of the installation being conducted in Iraq or Kuwait. This required significant project management and engineering effort and required civilian contractors to move to Kuwait.

And while this is testimony to the excellent cooperation between Defence and industry, with special mention of General Dynamics Land Systems-Australia (bar-armour), Seal Solutions (RWS) and Armatec (spall liners) on getting an urgent job done, it reflected the urgent need to improve the crew's protection in what was proving to be a far from benign working environment.

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Phase 4 midlife upgrade

Phase 4 of LAND 112, the survivability enhancement and midlife upgrade of the ASLAV fleet, received first pass approval in 2006. It may include enhancements such as mine protection, ballistic protection, integration of Army's Battlespace Management System, signature management and a defensive aid suite. The additional weight from some of these enhancements, such as armour for protection against IEDs and rocket-propelled grenade (RPG) attack, would need to be offset and the motive power increased to handle a heavier vehicle.

A Systems Design and Development (SDD) activity has been conducted to investigate options to enhance the survivability and situational awareness of the ASLAV. This is principally a prototyping activity aimed at reducing the risk involved in the production and introduction into service of the Phase 4 solution.

Design studies were undertaken to determine options for upgrading the vehicle's survivability. According to Defence these studies, and an analysis with the original equipment manufacturer General Dynamics Land Systems (GDLS), last year, have helped develop a robust set of requirements and the identification of other ballistic and mineblast protection options. These have been reviewed and Defence's expectation is that a viable solution will be proposed for final approval, which may include mine blast protection (through covers under the rear two axles), enhanced ballistic and fragmentation protection with applique aluminium armour and extended spall protection systems. The powerpack would be upgraded and remanufactured to zero km and a multi-spectral camouflage system offered for signature management.

The DAS option

There is a requirement for the ASLAV to be capable of operating successfully in an anti-armour threat environment. An obvious difficulty in enhancing the ASLAV's survivability through ballistic and mineblast protection is the weight penalty that is incurred. A solution may be to equip the vehicle with a defensive aids suite (DAS), an integrated collection of self-protection systems, capable of countering hostile target acquisition systems and incoming anti-armour munitions.

There is a requirement for the ASLAV to be capable of operating successfully in an anti-armour threat environment.

Defence sees a DAS solution as having the potential to assist the achievement of a survivability-mobility balance appropriate for a Light Armoured Vehicle such as the ASLAV. A DAS would enhance the vehicle's survivability while retaining current levels of land and amphibious mobility and incurring only a relatively small space and weight demand.

ASLAV survivability can be viewed as a series of layers including Avoid Detection, Avoid Being Targeted, Avoid Being Hit, Avoid Penetration, and Mitigate Effects. A DAS solution would operate in the spectrums of Avoid Being Targeted and Avoid Being Hit. The capability aspiration is for the ASLAV to be able to counter or defeat an incoming projectile threat prior to penetration or perforation of the vehicle's structure.

As the level of DAS required will not be known until all other ASLAV survivability options are considered, Defence sought information on a range of DAS capability options, from high end systems to low end solutions. At the high end of the DAS capability spectrum, the systems proposed should be capable of:

- providing situational awareness and timely warning to the ASLAV crew of surveillance, range finding, and target acquisition devices
- providing hostile fire indication of ballistic and rocket-propelled guided and unguided threat to the ASLAV
- countering the above threats through passive (e.g. electronic and deployed countermeasures) and active (e.g. shooting down the incoming projectile 'hard-kill') means.

Phase 4 also includes the DAS requirement as a separate process designed to coordinate with and support the broader ASLAV enhancement activity. Defence says the major reason for this approach is the high technical risk of purchasing a system that is immature and yet to be proven on a land vehicle. A further consideration was the anticipated high cost of acquiring a high-end DAS, should the requirement for such a system be defined.

A separate procurement process was devised that would enable DSTO and DMO experts to undertake research and collect market data. To this end, to demonstrate and evaluate DAS systems, Defence conducted a two-stage procurement process comprising the October 2008 release of a Request for Proposal which closed in December. Following evaluation a Request for Tender, restricted to selected respondents, was expected to be released in early April 2009, with a contract award for this demonstration and evaluation phase timed for July 2009. This schedule has slipped and by the end of April, no announcement had been made. It was also anticipated that the demonstration and evaluation of systems would be completed by March/April 2010 with the acquisition of production DAS to follow, if approved.

Defence hoped that respondents would offer multiple DAS solutions ranging in capability level, with any chosen solution capable of further upgrade, without subsequent physical and functional architecture redesign. Because the system should ultimately be capable of providing the full-spectrum level of protection for the ASLAV, the DAS should be built from open architecture standards and be modular and scalable in design.

Canadian DAS research

A 2007 Canadian study* on DAS technology is particularly illuminating and has seemingly influenced the Australian requirement. In their introduction, the authors noted that, over the last 10 years, changes to the global strategic environment gave rise to a requirement for lighter, more rapidly deployable forces. Current forces, mainly equipped with 50-70 tonne main battle tanks (MBTs), lacked the operational mobility required by the new environment, where military forces are required to deploy quickly over large distances in response to a crisis. Hence, armoured formations need to be equipped with lighter, more rapidly deployable vehicles.

Light Armoured Vehicles (LAV) in the 20-30 tonnes range have better strategic and operational mobility than MBTs, but lack the protection and firepower of the heavier vehicles. However, it was the opinion of the Defence Science and Technology community that the overall battlefield effectiveness of LAVs could be increased by implementing technologies to improve crew situational awareness and equipping them with a DAS. This study appears to be particularly relevant to LAND 112/4 due to its broad focus on the survivability of wheeled combat and light armoured vehicles.

At its most basic the DAS uses obscurants, counter-manoeuvre, counter-fire, dazzling and jamming to defeat most threats with acceptable levels of success. The most

* *A Preliminary Study of Defensive Aids Suite Technology for the Armour Combat Vehicle Programme*, by J.L.Rapanotti, A.Cantin and R.G.Dickinson, DRDC Valcartier TM 2003-274, February 2007.

significant challenge, however, is to detect and defeat a missile, rocket or projectile directed at the vehicle. The study authors suggest explosive reactive armour as a possible option but even this is seen as limited by new missile designs based on multiple shape-charge warheads. And of course to defeat an incoming projectile, such as an RPG from less than 500m, defensive aids at the higher end of the spectrum, including those capable of considerable collateral damage, may be required. Such hard kill systems are now under development and are known to have been offered for the LAND 112 Phase 4 requirement.

The Canadian researchers were well aware of the need to counter short range RPGs through a close in defence system which would need to be highly reliable if it was to provide a good basic survivability. One solution they offered was the so-called Smart Armour Protection System (SAPoS), a concept of active protection of armoured vehicles against attacks of missiles, particularly those of the type that flies over the target and attacks it from the top. SAPoS uses electro-optic and radar sensors to detect and locate an incoming threat and uses an array of shaped charges mounted on the vehicle to defeat it. The shaped charges are selectively fired at the threat in clusters of three. The prominence of SAPoS was primarily because of the authors' assessment of the importance of the very short range RPG threat. No other system could react quickly enough for a weapon fired at less than 500 metres.

Comment

The protection of soldiers is an issue of mounting (and proper) concern and crew protection requirements—particularly those that arrive as afterthoughts—are costly features of major projects such as the artillery and vehicle replacement programs.

It appears, to this writer at least, that the Canadian research into the development of a DAS indicates the importance of situational awareness through the use of laser and radar warners as well as acoustic shot location devices. (The Thales Elix-IR system has been selected for the DSTO CTD-11 Vehicle Situational Awareness program and may be relevant to this requirement.)

The protection of soldiers is an issue of mounting (and proper) concern and crew protection requirements—particularly those that arrive as afterthoughts—are costly features of major projects such as the artillery and vehicle replacement programs.

However, the idea of equipping ASLAVs with high-end hard kill systems, such as those employing reactive armour or electro-reactive armour, to defeat short range RPGs—to some extent mitigated by the application of bar armour to these vehicles—and which would have virtually no impact on IEDs, the other threat these vehicles face in current operations, would be an extraordinary (and in our view unlikely) step to take.

A far better step would be to progress the acquisition of the 2009 Defence White Paper's Combat Vehicles, as forward echelon replacements for the ASLAVs.

Eight into eighteen won't go—maritime surveillance aircraft

Gregor Ferguson

The 2009 Defence White Paper's focus on 'controlling the air and sea approaches to our continent', as well as on the stability and security of Australia's immediate neighbourhood and the wider Asia-Pacific region, maintains a long-standing emphasis on the ADF's maritime surveillance and response capabilities.

These are currently embodied in the nineteen Adelaide-based AP-3C *Orions* of the RAAF's Surveillance and Response Group (SRG). Although unglamorous, they are among the few ADF force elements whose peace time role and activities closely resembles their wartime combat duties as they patrol Australia's maritime approaches, economic zones such as the Southern Ocean fisheries, oil and gas installations on the North West Shelf and other areas of interest to the ADF.

Their successors will enter service over the coming decade and will be augmented, according to the 2009 Defence White Paper, by a remote sensing satellite and enhanced surveillance and intelligence networking and management capabilities. These will provide a mechanism for increased Intelligence, Surveillance and Reconnaissance (ISR) cooperation with the United States.

ISR is core business for the ADF. The White Paper acknowledges this by foreshadowing a major enhancement of Australia's ISR capabilities, with a new network infrastructure to provide a better integrated 'Common Operating Picture' across the ADF's primary operational environment. The SRG's *Orions* and *Wedge tail* early warning aircraft (see later in this chapter), and the aircraft that replace the *Orions* will make a critical contribution to this picture.

The *Orions* will be replaced under Project AIR 7000 by a mix of manned and unmanned aircraft at an estimated cost (2006 Defence Capability Plan) of about \$6 billion. The White Paper confirms this will consist of eight manned aircraft—almost certainly the US Navy's P-8A *Poseidon*—and seven High-Altitude, Long Endurance (HALE) Uninhabited Air Vehicles (UAVs) similar to the US Navy's RQ-4N *Global Hawk* Broad Area Maritime Surveillance (BAM) system. Both aircraft types will be based at RAAF Edinburgh, near Adelaide, and will be operated by SRG's 92 Wing.

These aircraft will also be required to operate over coastal areas and land as well as the sea, using their radars, electro-optical and infra red (EO/IR) sensors and Electronic Surveillance (ES) systems to support land and amphibious operations. The RAAF's *Orions* have in fact been operating in this way over Iraq and the Gulf since 2003 and have built up a formidable level of expertise and domain knowledge.

The 2006 Defence Capability Plan (DCP) has the *Orion* replacements being acquired in two phases. But their order has been reversed, following an announcement in early-March 2009 that Defence would defer the purchase of the UAV. The original plan was to acquire what it termed a Multi-mission Unmanned Aerial System (MUAS) and associated command and control elements worth up to \$1.5 billion. This capability was scheduled to enter service between 2009 and 2011, but for a variety of reasons this date has slipped four years, bringing it into direct conflict with the acquisition of

the manned Maritime Patrol and Response Aircraft (MPRA)—the *Poseidon*—under Phase 2B in about 2016.

The original plan was for a smooth, stepped transition from the current force of *Orions* without allowing any sort of capability gap to emerge.

The original plan was for a smooth, stepped transition from the current force of *Orions* without allowing any sort of capability gap to emerge, first by introducing the MUAS and then by replacing the *Orion* with the *Poseidon*. In order to benefit from its close ally’s R&D and production investment, the RAAF planned to join the System Development and Demonstration (SDD) phase of the US Navy’s Broad Area Maritime Surveillance (BAMS) program and help develop the RQ-4N maritime variant of the *Global Hawk* UAV.

But on 2 March the Minister for Defence announced that the Commonwealth had decided to defer purchasing the MUAS and not to join the BAMS program because its schedule had slipped to the right, resulting in the earliest possible in-service date moving out to 2015. This brought it into direct conflict with the introduction of the *Poseidon*. Defence hasn’t decided yet when the MUAS should enter service.

Log jam

The scheduling conflict of these phases created two problems: first of all, introducing two new aircraft types simultaneously at the same base while trying to maintain a credible operational capability during the transition would be a recipe for chaos, especially under Defence’s current manpower constraints. Secondly, there was a real risk the current maritime patrol capability would suffer if both the manned and unmanned components of AIR 7000 encountered difficulties or delays. Attempting to introduce both new aircraft at once would be offering too many hostages to fortune. Defence’s response to this impending log jam has been to focus on acquiring the manned MPRA and defer acquisition of the MUAS until after the *Poseidon* enters service. This has created a couple of further problems for the ADF, however.

Attempting to introduce both new aircraft at once would be offering too many hostages to fortune.

There’s a risk that any delay in fielding the MUAS will create a significant capability gap: the decision to buy just eight *Poseidons* is predicated on their superior reliability and availability than the ageing *Orions*, and also on the surveillance capabilities of the MUAS which can carry out extended patrols of more than 30 hours duration. If the MUAS is delayed for any reason, the *Poseidons* won’t be able to perform all of the duties of the *Orions*. Despite the *Poseidon* being able to cover more territory per flight hour due to its higher speed, concurrency remains an issue. Eight into eighteen just doesn’t go, in this instance.

Furthermore, the decision to defer buying the BAMS *Global Hawk* (which is rather different in sensor payload and capabilities from the current US Air Force version) means the RAAF will almost certainly forego the opportunity to have the baseline BAMS aircraft configured to match its needs. Instead, if the RAAF chooses to buy

this UAV in the future (and that's by no means certain), it will have to pay for any modifications or additional capabilities required to meet its specific requirements.

This problem would be avoidable if the BAMS aircraft were to be available earlier, and is a consequence of Defence's desire to avoid the risk and expense of fielding unique 'orphan' capabilities. In this case Defence made a strategic decision to join the US Navy's BAMS and *Poseidon* programs in order to field highly capable, all-new systems which were developed and supported by a large parent operator. The slippage in the BAMS schedule isn't a significant issue for the US Navy in the way it is for Australia, whose maritime patrol and surveillance capabilities are embodied in a smaller, ageing fleet.

The RAAF collaborated closely with the US Navy in specifying operational requirements for BAMS UAV system. The US Navy in turn was extremely supportive—indeed, its tender specification for the BAMS contract included a chapter of additional and unique Australian requirements which the contenders were asked to address, though these weren't taken into account in the final tender evaluation. In 2008 the US Navy selected Northrop Grumman's RQ-4N *Global Hawk* as its BAMS platform in preference to solutions offered by Boeing and Lockheed Martin, and the RAAF planned to join the SDD phase of the program in order to acquire a common system.

This won't happen now, and the ADF is back in the marketplace for a HALE UAV. When Phase 1B gets under way again the BAMS *Global Hawk* will still be a contender, but the ADF will also be looking out for other suitable solutions—after all, ten years is a very long time in the UAV world.

As for the *Poseidon*, Defence has signed the Spiral 1 Cooperative Development MoU and is almost certain to propose adopting this variant of the aircraft when the business case for Phase 2B goes up to the National Security Committee of cabinet for 2nd Pass Approval in 2012/13. The *Poseidon*, like the *Wedgetail*, is based on Boeing's 737 airliner. It is designed to carry out surveillance (at sea and over land), detection and tracking of submarines and surface ships, and prosecution of hostile targets using anti-submarine torpedoes and anti-ship missiles. The manufacturer, Boeing Integrated Defense Systems, maintains the baseline P-8A will be more capable than the US Navy's P-3C *Orions*, which it will replace, as well as the RAAF's AP-3C *Orions*, including its coastal ('littoral') and land surveillance capabilities.

While this may be true, the configuration and baseline capability of the *Poseidon* have now been 'frozen' and will be nearly eight years old by the time the RAAF starts fielding the aircraft in 2016; therefore the ADF has chosen to help develop the enhanced Spiral 1 upgrade and field this instead. Spiral 1 will incorporate an upgraded acoustics processor for sonobuoys, improvements to the communications system, and an enhanced level of command and control functionality enabling it to operate as a Tactical Operations Centre.

If the decision to purchase the *Poseidon* is confirmed at the 2nd Pass milestone in 2012/13, the RAAF will bring it into service between 2016 and 2018 (which is the *Orion*'s planned withdrawal date), at a cost estimated in the 2006-16 Defence

Capability Plan of up to \$4.5 billion—although the May 2009 press release cited \$5 billion.

Contingency plans?

There have been suggestions that Defence could field some sort of interim UAV capability in order to forestall the possibility of a capability gap and to introduce the ADF to this technology prior to acquisition of the *Poseidon*. Defence has acknowledged it is putting in place contingency plans to provide UAV capabilities, but hasn't provided any further details. It's not clear when these will emerge, but they may be in the 2009 Defence Capability Plan which is due to be released in June 2009.

The difficulty with introducing any sort of effective UAV capability is providing cash and resources to operate it. There is no extra money available for this capability at present, so even an interim capability would require the RAAF to close down part of its *Orion* fleet to free up cash and personnel to operate it.

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The ADF could offer the USAF and US Navy access to *Global Hawk* (or other UAV) support facilities in Australia, in return for access to their surveillance data. But Australia and the US already share such surveillance data and a key outcome of the 2009 Australia-US Ministerial (AUSMIN) talks in Washington was an agreement on principles for even closer cooperation in future on ISR.

An alternative might be a limited life extension program for a portion of the *Orion* fleet to enable the RAAF to maintain a suitable rate of effort pending the introduction of the MUAS. Most of the issues affecting the *Orion*'s life of type relate to the increasing age of the airframe, engines and their various ancillary systems, rather than to the avionics and sensors themselves. Cost-effective repair schemes exist and Australian industry has world-class expertise in repairing and upgrading the *Orion*, if Defence believes this is the right course of action.

It's not clear yet how, and how far, the remote sensing satellite foreshadowed in the White Paper will overlap with the manned and unmanned aircraft: their various capabilities are all different, though overlapping and mutually supportive. The devils of schedule, scope and cost for these new capabilities lie in the detail; the White paper hasn't provided this level of insight.

The Growler—airborne electronic attack

Tom Muir

Concerned that the F-35 *Lightning II* Joint Strike Fighter would not be operational by the time the F-111 fleet was retired, the previous government signed a contract in May 2007 for the acquisition of 24 F/A-18F Block 2 *Super Hornets* as a 10-year bridging air-combat capability.

There was a school of thought that, with the introduction of these new strike/fighter aircraft and the upgrading of the so-called ‘classic’ F/A-18 fleet, delay in the introduction of the F-35s could not only be tolerated, but might actually be welcomed. That would be the case if this provided breathing space for those charged with managing the transition of a new aircraft type into service, and if economies in the later stages of production reduce the unit price of aircraft.

The *Super Hornet* had been offered by Boeing years back as an alternative to the expensive AIR 5376 Hornet Upgrade (HUG) program and, as a true multi-role aircraft, it offered the counter-air and ground attack capabilities the Air Force requires as well as the potential for F-35 lead-in experience. The package offered to the RAAF included such advanced capabilities as AESA radar, Link 16 connectivity with the Multifunctional Informational Distribution System (MIDS), guided missile launchers, night vision, mission planning and fibre-optic towed decoys.

The Block 2 *Super Hornet* has a maritime strike capability and can also transmit coordinates for the Joint Direct Attack Munition (JDAM) to an F/A-18 via Link-16. Recent disclosures about the range and capability of its APG-79 Active Electronically Scanned Array (AESA) radar, along with what is understood to be a very low Radar Cross Section (RCS) across its frontal aspect, suggest that the *Super Hornet* Block 2 may be more capable and survivable than its critics contend.

These attributes, and the aircraft’s ability to fire *Harpoon* Block 2 anti-ship missiles, may have been decisive in steering the RAAF and government towards a *Super Hornet* buy. And the two-seat cockpit was selected over the single seat F/A-18E to enable a two-man crew to fully exploit the type’s offensive and defensive capabilities. RAAF pilots and rear-seat air combat officers (ACOs) begin training in the USA this year, with Nos. 1 and 6 Squadrons planned to become fully operational with the F/A-18F in 2010. Our understanding is that crews selected for training with the *Super Hornets* have been drawn in part from F-111 two-man crews, from classic F/A-18 pilots, and from recent fast jet inductees.

Growler capabilities

The recently announced \$35 million investment to convert half of the *Super Hornets* to the F+ configuration, that is to install cabling and wiring on the production line as a hedge against their later conversion to EA-18G *Growler* electronic attack aircraft, will provide significant savings should the conversion go ahead. Completion of the project will require an additional investment of around \$300 million. That final decision will not be required until around 2012, and if implemented, will provide new roles for ACOs and new operational concepts for RAAF offensive air operations.

If acquired, the RAAF's *Growlers* will have an extraordinary range of jamming and suppression capabilities as well as complementary weapons systems. (Although dedicated to the electronic attack mission, the aircraft can be changed from an EA back to an 'F' and vice versa, with relative ease.)

If acquired, the RAAF's *Growlers* will have an extraordinary range of jamming and suppression capabilities as well as complementary weapons systems.

The EA-18G incorporates a version of the airborne electronic attack (AEA) suite developed for the Improved Capability (ICAP) III EA-6B (*Prowler*) upgrade. This includes the AN/ALQ-218 wideband receivers on the wingtips, and up to five ALQ-99 high and low-band tactical jamming pods.

This system is designed to identify, degrade and destroy enemy radar-guided air defence and communication systems. Its sensitive receiver and sophisticated algorithms allow selective-reactive jamming and threat precision geolocation capabilities. Weapons typically include two AIM-120 self-defence missiles and two AGM-88 anti-radiation missiles. The EA-18G will also use the INCANS Interference Cancellation system that allows voice communication while jamming enemy communications.

Importantly the *Growler* will also be able to use its AESA radar for electronic attack, with a software upgrade to allow its array of transmit/receive (T/R) modules to be used as a powerful directional jammer. Under a sensor integration plan, the radar will be linked to the ALR-67 radar warning receiver (RWR) via the fighter's fibre-optic network switch. The radar's ground mapping capability will then be used to pinpoint emitters detected by the radar warner.

***Growler* cockpit**

The two-seat cockpit comprises the pilot crew station and the ACO's advanced crew station behind it. The latter is equipped with a touch-screen mission systems control and display, a full-colour tactical display, and two multipurpose screens. The displays have tactical aircraft moving map capability.

The aircraft is equipped with hands-on throttle and stick (HOTAS) control and full digital fly-by-wire controls. The rear station can be equipped with a stick to share flight control over long sectors. The aircraft is fitted with a helmet-mounted cueing system providing 'first look, first shot' high off-boresight weapons engagement capability. The system enables the pilot to accurately direct or cue the weapons against enemy aircraft while performing high-g manoeuvres including 'over-the-shoulder' target designation and prosecution.

In the *Growler*, identical, independent displays with HOTAS functionality give both front-seat pilot and back-seat ACO access to all aircraft and mission information. New display formats correlate inputs from on-board sensors and off-board Link-16 MIDS intelligence sources in a coherent picture. In developing the two-crew cockpit, contractor Northrop Grumman built an EA-18G Systems Integration Laboratory to develop *Growler* software and to make sure the airborne electronic attack systems were compatible with one another and a crew of two. This involved reducing the

workload normally split between the two electronic systems operators in the larger *Prowler*, to one operator in the *Growler*.

A *Growler* crew station design group used NASA workload ratings to make the workload more manageable. While the basic display systems between *Prowler* and *Growler* are very similar, less detail is provided to the *Growler* at the top level, nevertheless full detail remains available to the EA-18G operator who ‘drills’ down into the AEA system.

The *Growler* crew will also manage new capabilities never available in the *Prowler*. In contrast to the latter’s limited radar, for example, the AESA radar in the *Growler* tracks multiple air and ground targets. The US *Growler* community has begun learning to crew its new strike-fighter-jammer, and currently are finding that the optimum mix is *Hornet* experience in the front and a *Prowler* person in the back. If *Growlers* are built for the RAAF, our bets are on a full 12-EA-18G complement. In that case we can anticipate *Hornet/Super Hornet* pilots up front, working with ACOs trained for AEW and AEA operations in the back.

RAAF *Growler* missions

The EA-18G aircraft will be a missionised F/A-18F airframe providing capabilities to detect, identify, and locate hostile radio frequency emitters in order to direct jamming against radar and communications threats, and to fire suppression weapons such as High-speed Anti-Radiation Missiles (HARMs).

The *Prowler*, was designed to complement the US Navy’s defences in an intense electronic warfare environment and compete with the ever-increasing complexity of hostile radar-guided guns, missiles and aircraft. Its primary role has been to protect fleet surface units and strike aircraft by jamming enemy radar and communications, and to perform electronic surveillance. In strike missions the *Prowler* has mainly been used for Suppression of Enemy Air Defences (SEAD) achieved through the use of jamming equipment and anti-radiation missiles. Similarly, likely Australian operational tasking would include the neutralising of enemy air defence systems, particularly their early warning radars, in advance of strike missions against maritime or land targets. HARM missiles would also be employed to destroy radars used to guide hostile surface-to-air missile attacks.

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For Australian service the *Growler* would be seen as a force level electronic warfare support asset, which enhances all land, sea and air capabilities. It would also be a complementary capability for air strike and air superiority platforms like the JSF and the *Super Hornets*. According to Defence, the *Growler* and JSF will be fully interoperable by design, as the US Navy plans to operate each of its aircraft carriers with two squadrons of JSF, two squadrons of *Super Hornets* and a flight of five *Growlers*, out beyond 2030.

There is a general understanding that airborne electronic attack (AEA) comprises five primary disciplines, each taking the action progressively closer to the target:

- Stand-off jamming. Here aircraft loiter outside the range of enemy missiles while sending out powerful waves of high-bandwidth energy at an entire region of enemy territory.
- Escort jammers. The aircraft go in closer, flying alongside or near strike aircraft during their journey into hostile airspace. These fighter-type aircraft are equipped with pods that generate intense energy to saturate enemy radar receivers and blind them to the exact whereabouts of the strikers.
- Attack jammers. These are aircraft equipped with external pods or internal ECM systems to generate self-protection jamming as they near the target. New active electronically scanned array radars, or AESAs, have great power and huge potential to do some jamming and precisely identify and locate threat radars. Towed decoys also play a part in the self-protection ring.
- Stand-in AEA. This role comprises systems designed to defeat enemy radars at practically point-blank range. UAVs and drones are better suited to this mission which is considered too risky for manned aircraft.
- Cyber-attack. Network attacks are used to trick enemy radars into turning off or presenting false information to their operators.

While we are not privy to RAAF AEA operational concepts we would assume that escort jamming would be perceived as a major role for *Growlers* in the land attack/strike role but that maritime strike might well be performed by weaponised EA-16G aircraft on their own.

Other roles are likely to include stand-off jamming and combat support jamming for the triggering of IEDs and the massive dislocation of mobile phone and other land communications prior to land operations by friendly forces. No doubt consideration is now being given to the development of AEA operational concepts against the time that the ADF finally achieves an airborne offensive EW capability.

The Air Warfare Destroyer Project—so far, so good

Gregor Ferguson

Three new *Hobart*-class Air Warfare Destroyers (AWD) will replace the RAN's four recently upgraded *Adelaide*-class FFG frigates from 2014. At 6,250 tonnes they will be nearly twice the displacement of the older ships, and significantly more capable.

They will be equipped with the Lockheed Martin *Aegis* air warfare system, and the 2009 Defence White Paper confirmed they will be armed with a sea-launched, land attack cruise missile as well as the latest version of the US Navy's Standard Missile family, the SM-6, which will provide for long range air defence out to a range of 370km. They will also be fitted with *Harpoon* missiles for anti-surface warfare (ASuW) as well as the US Navy's Cooperative Engagement Capability (CEC) which enables a ship to use its *Aegis* SPY-1D(V) radar to track and designate targets for a missile fired by another ship.

This is an important enabler for the anti-ballistic missile capability which the government is still considering adding to the AWDs at some point in the future. While the SM-6 isn't designed to shoot down ballistic missiles, the ships' Mk41 launchers can also accommodate the SM-3 anti-ballistic missile missile should the government decide Australia needs this capability. And the government hasn't ruled out acquiring a fourth AWD if a future strategic assessment recommends this, though it hasn't put a timeframe on the decision.

The AWD program, or Project SEA 4000, has been the subject of intense scrutiny, not least because of strong inter-state rivalry over where in Australia the ships should be built, and then over which design the RAN should adopt. Acknowledging the relentless market forces which have rationalised so many defence manufacturing sectors, in 2005 Defence decided they would be built at Osborne in South Australia. government-owned ASC Pty Ltd, which built the *Collins* Class submarines, would build the new warships on an expanded Common User Facility established by the South Australian Government adjacent to the company's submarine construction yard.

This effectively gave ASC and the adjacent Techport Australia shipyard a monopoly on naval construction in this country once the BAE Systems yard at Williamstown in Melbourne delivers the last of the RAN's two 27,000 tonne amphibious landing ships.

Defence made an early decision the ships would employ the US Navy's *Aegis* air warfare system and this resulted in a short list of two competing platform designs, both of them *Aegis*-equipped. They were the Spanish Navy's F100 frigate, which was offered virtually off the shelf; and an Evolved DDG, based on the US Navy's existing (and much larger) DDG-51 destroyer.

The *Aegis* system was ordered from Lockheed Martin through the US Navy under a US government Foreign Military Sales (FMS) arrangement; at the time Australia's order was the last for the *Aegis* air warfare system, which meant an order for a fourth AWD was necessary by the end of 2008. But a recent US decision to acquire more DDG-51s has kept the *Aegis* production line open, meaning Australia has more time to consider the case for a fourth ship.

Following the process recommended in the 2003 Kinnaird Review, the government decided in 2007 the F100 offered the best balance of cost, capability and risk and was chosen as the basis for the AWD. The cost of building the three ships will be about \$8 billion.

Given the technical and commercial problems which dogged the construction of the *Collins* Class submarines, and in particular their original combat systems, Defence chose an alliance contracting model to handle the technical and commercial complexities of this project. It also decided the combat system would be delivered by a Combat System Systems Engineer (CSSE) responsible for selecting and integrating equipment such as fire control radars sonars, Electronic Warfare (EW) and communications equipment with the core *Aegis* system.

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The CSSE would be a member of the AWD Alliance, alongside ship constructor ASC Shipbuilder Pty Ltd and the Defence Materiel Organisation (DMO). Spanish firm Navantia, which designed the F100 and builds this class of ships for the Spanish Navy, is the AWD platform designer under a design services sub-contract from the DMO.

This somewhat convoluted construct was conceived to deal with the uncertainties inherent in the far more developmental Evolved DDG design, but was subsequently considered suitable also for the F100 when this was selected. The decision to appoint a CSSE was based on the guidance set out at that time in the DMO's extant Electronics Systems Sector Plan for Australian industry.

Taken in isolation this makes sense but it ignores the experience of other navies which have also adopted the *Aegis* air warfare system: in particular, it keeps the manufacturer of the *Aegis* system itself—the heart of the AWD's combat system—at arm's length in a contractual sense, working through the US Navy rather than directly with the Alliance principals. Previously, Lockheed Martin has always worked directly with the other project principals in whichever country the ship was being built. Lockheed Martin's contract under SEA 4000 is to provide three ship sets of the latest US Navy *Aegis* version, Baseline 7.1 Block 10, along with engineering services during installation.

This is the first *Aegis* ship program in which Lockheed Martin appears to have been so marginalised. The company now has just two engineers working in a 'partitioned' space at the AWD Systems Centre in Adelaide and there are reported to be no Lockheed Martin staff at all in Canberra working on the project.

This has potential consequences for the through-life support of the *Aegis* system because much of the support philosophy and infrastructure needs to be established early in the construction program, with linkages in place to facilitate Through Life Support (TLS). At present there is no TLS arrangement in place for the *Aegis* system once the ships enter service, though the Alliance has said that *Aegis* hardware and software TLS will be provided by the US Navy. The US Navy provides TLS for the

Aegis system for both its own ships and international customers. Requests for assistance beyond the capabilities of the US Navy go to Lockheed Martin or other equipment and sub-system providers, depending on the issue.

Meanwhile, as the AWD Alliance continues the process of selecting and signing contracts with key sub-system suppliers for the combat system, Lockheed Martin was able to announce in early-2009 that the first ship set of *Aegis* equipment had been delivered to the company's test site in New Jersey ahead of schedule and below budget.

All that said, the project is travelling well at present and meeting its key milestones. Defence considers it is well placed to be successful. The Preliminary Design Review (PDR) for the *Hobart* Class was held on schedule in Adelaide in December 2008 and went well. Design data is being delivered on schedule from equipment suppliers and sub-contractors to Navantia to enable detailed platform design to proceed on schedule, and the company delivered the first set of production drawings to Adelaide on time in early-2009.

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Many of the important combat system sub-elements have been selected on schedule, such as the satellite communications, sonar, navigation radar, Infra Red Search & Track, Very Short Range Air Defence (VSRAD) system and torpedo launch tube; others such as the EW system are in the tender stage, while one of the last elements to be selected will be the internal and external communications suite in order to avoid potential obsolescence due to a too-early choice of equipment and supplier. The combat systems sub-elements are expected to have a 10-year effective service life before being overtaken by obsolescence or old age.

One of the traps the project is keen to avoid is unnecessary software development and integration activity, so it won't countenance more than minimal changes to the *Aegis* system operating software. The non-*Aegis* combat system components will communicate with *Aegis* through a device called the Australian Technical Interface (ATI). This is a single point portal through which signals pass between the *Aegis* system itself and external equipment and sensors such as the sonar, IRST and navigation radar. Before being installed on the first ship, the ATI itself and the combat sub-systems will be taken to Lockheed Martin's *Aegis* facility in the US for system-level integration and testing before being delivered to ASC.

Norwegian firm Kongsberg has completed a study contract to define the architecture for this ATI. The company had already produced a similar unit for the Royal Norwegian Navy's *Nansen*-class *Aegis* destroyers and Korea's KDX-III *Aegis* destroyers; while no supplier for the ATI has been named as yet it's generally acknowledged that the low-risk path would be to award this contract to Kongsberg.

And risk, or avoidance of it, is one of the drivers of this project. The platform and *Aegis* air warfare system will undergo the bare minimum of change consistent with the aims of the AWD project. The key to 'Australianising' the F100 design is getting the Communications, Sonar and Electronic Support Measures (ESM—the main EW

system) right. This is where the majority of risk lies and where the majority of integration effort will go. The AWD Alliance's aim is to select, where possible, proven off the shelf equipment, though the Ultra sonar suite selected late last year hasn't been integrated in its AWD configuration before. Tenders for the ESM system close in May 2009 and the AWD Alliance has deliberately solicited from manufacturers of proven naval ESM systems.

Outside these critical components, the AWD Alliance estimates that Australian Industry Involvement (AII) in the combat system element of the project alone could be worth up to \$850 million in services and materials.

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Meanwhile, on 9 May the Minister for Defence, Mr Joel Fitzgibbon, announced that two shipyards, FORGACS in Newcastle and AIMTEK in Cairns (trading under the long-established NQEA brand name), were preferred tenders for the estimated \$450 million contract to build sixty-six hull and superstructure modules (or 'blocks' as Navantia calls them) for the three ships currently on order. Contracts will be signed later this year. ASC Shipbuilder will construct only the twenty-seven core modules containing equipment such as the *Aegis* radar antennas and their wave guides. NQEA will manufacture thirty-six blocks over five years and fit them out with mission and platform equipment before delivery to Osborne. FORGACS will build and fit out thirty blocks.

The announcement was due early in 2009 and the delay suggests that tender evaluations proved harder than expected. While this has put module construction slightly behind the planned program, it hasn't affected the project schedule as yet—the first steel doesn't need to be cut until September 2009, with the first modules arriving at Osborne in early 2010. Indeed, detail design of the final module for the first ship won't be completed until 2011 and it will take about sixteen months to integrate the modules for each ship, including installation of the *Aegis* system. The final block for the third ship will be delivered in late-2014. Concurrently, the infrastructure to 'integrate' these modules into a finished warship is under construction at Osborne and on schedule for completion in time to receive and fit-out the first modules.

No launch dates have been announced, but on the current schedule HMAS *Hobart* will undergo provisional acceptance in December 2014, followed by her sister ships *Brisbane* and *Sydney* in March 2016 and June 2017, respectively.

Alliance structure

The AWD Alliance is designed to get the key players focussing on 'best for project' outcomes rather than separate bottom lines. The two industry partners, Raytheon and ASC, are jointly and individually responsible for delivery of the project under a pre-negotiated gain share/pain share arrangement designed to provide an incentive for them to perform.

If one of them encounters significant difficulties, enlightened and shared self-interest should ensure that the other helps to the best of their ability. If equipment or services come in below the so-called Target Cost Estimate, (TCE) the industry members share the profit; if they exceed the TCE, they share the cost of half of the over-run.

The umbrella under which TCEs for specific elements are set is the Alliance-Based Target Incentive Agreement (ABTIA), an unwieldy expression for what resembles a fixed-price contract. It's not, in fact, and even the expression 'Alliance' is a slight misnomer: the body in question is alliance-like, but it has features not seen in other alliances. The partners are not all equal and the customer, while also a member of the Alliance, has step-in rights if the project encounters severe difficulties.

The benefit of this contracting approach is that all the platform and combat system integration knowledge relating to the AWD will reside locally; with an anticipated 10-year obsolescence cycle for many of the main combat system components, and the certainty of capability upgrades down the track. This is vital to Australia's self-reliance. It should be noted also that the RAN plans to maintain its *Aegis* configuration as close as possible to the evolving US Navy configuration, so backward compatibility issues need to be managed also as changes are introduced.

However, this all differs considerably from the contracting models employed by the other customers for *Aegis* warships—the US, Spain, Norway, Korea and Japan. That difference, the alliance contracting model and the apparent marginalisation of Lockheed Martin, caused considerable disquiet among some industry observers early in the project; it was widely noted that no previous *Aegis* customer had sought to appoint a CSEE and that they had all dealt direct with Lockheed Martin. Initial concerns were undoubtedly exacerbated by commercial tension between Lockheed Martin and Raytheon in the US. They are fierce rivals, with much future *Aegis* development and manufacturing business in the United States at stake, and their competitiveness was threatening to infect the AWD program in Australia. The DMO nipped this problem smartly in the bud in 2008; all parties have been reminded of their obligations to deliver a successful outcome and the relationships appear to have settled down.

The Alliance philosophy is for the partners to jointly pursue 'best for project' outcomes, with collective responsibility for making and implementing key decisions. This ruthless focus on the project's 'bottom line' has the potential to shape Australia's naval industry in important ways by sidelining established players such as Thales Australia, whose long-established sonar business lost out to newcomer ULTRA Electronics, and BAE Systems Australia, whose Williamstown yard near Melbourne was considered a strong contender for the hull and superstructure block construction contract. These decisions have forced the unsuccessful companies to re-examine their business and investment plans with potentially significant long-term consequences.

One question still troubles many observers: why does it cost \$8 billion to build three ships based on an existing design and using a proven, off the shelf air warfare system? Much of the cost lies in establishing the design, project management, systems integration, ship assembly and TLS capabilities in this country but even so, compared with the reported cost of buying completed DDG-51s direct from a US shipyard, the AWDs look expensive. Furthermore, the level of local industry involvement is far

lower than achieved in the *Collins* Class submarine or ANZAC Ship projects, so it's hard to attribute this to a premium associated with local industry participation.

To the extent that Australia is paying any sort of premium for building the AWDs in this country, it is probably justifiable if that investment can be amortised subsequently across a follow-on order for new warships. The Future Frigates announced in the White Paper that will replace the ANZAC Ships and will also be built at Osborne is one such opportunity. This could be the trigger for a rolling ship construction program designed to flatten out the peaks and troughs of warship orders which have traditionally blighted Australia's naval industry.

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Conclusion

At this stage, Project SEA 4000 is travelling well. The Critical Design Review will take place in Adelaide in December 2009. This will be a critical check of the maturity of the ship design and of project performance overall.

However, the project hasn't hit the most challenging parts yet. The platform elements represent a lesser risk than the combat system, but there's no room for complacency. The combat system, and specifically the integration process, represents the biggest risk. Although the core *Aegis* system is progressing well, the project is some way from delivering the required functionality of a complete combat system—the most difficult and risky part of the project hasn't begun yet.

Wedge~~tail~~: about to soar?

Gregor Ferguson

The RAAF's much-delayed Boeing 737 *Wedge~~tail~~* Airborne Early Warning & Control (AEW&C) aircraft has finally flown under operational conditions. In April a *Wedge~~tail~~* aircraft deployed to RAAF Base Tindal, NT, to take part in the ADF's biennial air defence Exercise Arnhem Thunder 2009, which began on 15 April.

The ADF's requirement for an AEW&C system is easily understood: as an island continent, Australia needs to be able to dominate the airspace above its maritime approaches in order to defend itself against both air and maritime threats. The *Wedge~~tail~~* system is designed to help achieve this, but also acts as a flying command post and communications node in many other scenarios. From a cruising altitude of 30,000ft it is designed to detect targets more than 400km away in all directions, track air and sea targets simultaneously, track high-performance aircraft while continuously searching for other targets and also detect certain types of hard to see targets such as cruise missiles.

The RAAF ordered six *Wedge~~tail~~* aircraft (and extensive ground-based support infrastructure) under the \$4 billion Project AIR 5077. Development of the *Wedge~~tail~~* got under way in December 2000, with deliveries originally scheduled for late 2006. The first two aircraft were modified by prime contractor Boeing Integrated Defence Systems (IDS) in Seattle, and the maiden flight was in May 2004. Since then, however, the project has run into significant technical difficulties and is currently running about 38 months behind schedule. While overall system performance has been unsatisfactory, one of the biggest concerns is the performance of its MESA radar, manufactured by Northrop Grumman, a 10 metre long spine sitting along the upper surface of the aircraft's rear fuselage.

The first difficulties emerged in 2006 with reports of problems integrating the MESA radar's side-facing antennas and the fore-and-aft-facing 'Top Hat' antenna mounted above them. There were also difficulties integrating the aircraft's Tactical Data Links (TADIL) as well as its EW suite. The initial schedule slippage was about two years. A further ten month slippage was announced in mid-2008, by which time the DMO was extremely concerned that the *Wedge~~tail~~* system was simply not delivering the radar performance the RAAF sought and was therefore not prepared to accept it for customer testing.

Boeing's most optimistic estimate now is that the first two aircraft will be delivered in November 2009 to enable operational training to begin, though these will lack the full Electronic Warfare (EW) functionality. The remainder will follow in March 2010 and DMO expects to achieve Initial Operational Capability (IOC) with full functionality, all of the ground support, training and logistics support in place and an initial cadre of trained crews by late-2011. Full Operational Capability is due the following year.

The *Wedge~~tail~~* deployed to Tindal, which was the first of four B737s converted at RAAF Base Amberley by Boeing Australia Ltd in 2008, was an active participant in EX Arnhem Thunder. It was flown and operated by a RAAF 2 Squadron crew from the Williamtown-based Surveillance and Response Group's 42 Wing. The exercise represented an opportunity for an Operational Utility Demonstration of the

capabilities of the aircraft under realistic environmental and operational conditions. Before it got under way, Boeing and Northrop Grumman expressed confidence that the exercise would vindicate their faith in the product.

... a summit meeting in Canberra in mid-year [will] determine the future course of the *Wedgetail* Project... The big question at present is whether or not it can actually perform... and in particular, whether or not the radar is working properly.

The exercise demonstration was one of three concurrent activities leading up to a summit meeting in Canberra in mid-year which will determine the future course of the *Wedgetail* Project. The big question at present is whether or not it can actually perform its prescribed tasks and, in particular, whether or not the radar is working properly.

To resolve the issue, in December 2008 the Commonwealth and Boeing signed a Deed of Agreement to undertake a complex Test & Evaluation (T&E) program running through early 2009. Three separate and concurrent streams of activity would converge in mid-year at the Canberra summit between the Commonwealth, Boeing and Northrop Grumman to determine the exact state of the system and the path forward, if any.

The first activity was EX Arnhem Thunder and the Operational Utility Demonstration. The second activity is Acceptance Test & Evaluation (AT&E), a formal program of trials assessing the entire system against the Commonwealth's specifications. Although due for completion in June, its sheer complexity might see it run beyond this deadline. However, Defence is comfortable that much of the system is actually working quite well.

The third activity is an examination of the radar's performance by the Massachusetts Institute of Technology (MIT) Lincoln Laboratory in Lexington, Massachusetts. This is a US federally funded laboratory with strong research credentials in air and missile defence radar technology. The laboratory was engaged by the DMO to undertake an Independent Validation and Verification (IV&V) of the MESA radar's performance based on flight test data provided by the Commonwealth. Its role is to assess the radar performance against the specification—in effect, to see if the radar is actually working as advertised.

This has proved unexpectedly difficult to determine. The Commonwealth, Boeing and Northrop Grumman can't agree on whether or not the system is working properly because of unexpected difficulties testing the radar itself and the system as a whole, both on the ground and in the air. In any system as complex as the *Wedgetail* its separate sub-systems are first tested in the laboratory. Then the full, integrated system is tested in the laboratory before the full system is tested aboard the aircraft on the ground. Finally, the entire system is tested in the air. But the *Wedgetail* radar is so powerful it can't be tested at full power on the ground, so the rest of the system can't be integrated with it and tested properly before flight. More of the testing and systems integration process than expected has had to be carried out in the air using technologically immature sub-systems and software, so it has taken much longer than expected for the system as a whole to mature and stabilise.

Therefore, test results and trials data have been ambiguous. It hasn't always been clear whether anomalies or apparent performance shortfalls have been due to sensor or overall system issues, so the Commonwealth and Boeing haven't been able to agree on how well the radar itself and the overall system are working. While Boeing and Northrop Grumman are confident in their product, the Commonwealth maintains that the radar and its essential software haven't shown the maturity, or the integrated system the stability, necessary to enable the collection of definitive test data.

The Lincoln Laboratory report, due by mid-year, is intended to provide authoritative advice on how well the radar is actually performing, any shortfalls in its performance, and what options are available to remediate these shortfalls. The report will be examined during the summit in Canberra which will in turn look at how the *Wedgetail* system as a whole is performing both technically and operationally, what problems exist, and whether the project has a viable way forward.

The worst case scenario—acknowledged by Defence to be a ‘low probability’ outcome—is that the project could be cancelled. Realistically, Defence could only entertain this possibility if the performance is so irredeemably poor that it would be more cost-effective to acquire some sort of alternative, such as the US Navy’s Northrop Grumman E-2C *Hawkeye* AEW aircraft. The best case is that all parties agree the radar and mission system are stable and performing well, and that Boeing delivers the first two aircraft on the schedule it has set itself in November 2009.

The worst case scenario... is that the project could be cancelled. The best case is that all parties agree the radar and mission system are stable and performing well...

Defence is seeking a viable path forward—technically, operationally and commercially. Boeing and Northrop Grumman have already sold *Wedgetail* to Turkey and South Korea with further sales likely if the system performs to expectation, so they have every motivation to get the system working properly and resolve any commercial issues in an amicable way.

Wedgetail was always recognised as a high-risk program, notwithstanding the important risk-mitigation work done prior to the tender in 1998 (largely anticipating the recommendations of the 2003 Kinnaird Review). The RAAF is the first customer for Northrop Grumman’s innovative MESA radar as well as for the first military variant of the Boeing 737 airframe. While the mission system is based on other Airborne Warning And Control System (AWACS) developed by Boeing, about 40% of its software, or 1.6 million lines of software code, are all new.

Defence believes most of the problems are ultimately software-related and that *Wedgetail* hasn't hit the limits of what is scientifically possible, but the nature of an ambitious developmental program is such that delivery of exactly what is specified in the contract may not be possible. This was the case with the *Collins* Class submarine and that program was blighted by commercial disputes which significantly delayed resolution of the technical issues.

In April 2009 it was starting to look as if the *Wedgetail* capability specified in the prime contract may not be achievable in its entirety, and that Defence and Boeing will have to negotiate an outcome that reflects the intent, rather than the letter, of that contract. Boeing, for its part, has taken its responsibilities seriously and has invested some US\$1.3 billion of its own money in the program on top of the A\$2.9 billion prime contract. While neither party wants to compromise its bargaining position, the body language of the key players suggests that a sensible compromise is achievable, if it is recognised as the best outcome that all parties can hope for. The outcome all parties are hoping for is a common understanding that *Wedgetail* is demonstrating high levels of technical and operational performance and future growth potential, significantly beyond any likely alternative; and that its radar and mission system are sufficiently mature and stable to support introduction to service and initial operational training.

If there is a significant difference between the performance *Wedgetail* is currently delivering and what's specified in the contract, the summit should also characterise and quantify this so that the parties can negotiate a realistic end point. In this case, the difficulty will lie in agreeing a balance between performance and cost. If the cost of pursuing certain aspects of system performance is prohibitively high, the parties must be able to resolve this in a businesslike fashion. While essential capabilities must be delivered, it may be possible to delay or dispense with others which require more time and money to achieve. Schedule is also a factor here for both Boeing and Defence, so protracted negotiations wouldn't serve either party.

There appears genuine willingness on both sides to achieve this resolution. In Boeing's most optimistic schedule, the summit will establish that *Wedgetail* can achieve operational capability by March 2010, clearing the way for deliveries of the first two aircraft to Williamtown in November 2009 to enable the start of training. In this scenario, development work will continue, leading to delivery of the remaining four in March 2010, when the entire fleet will then be mission-capable. Defence is keen to help Boeing achieve this schedule, but believes it is probably over-optimistic. Nevertheless, if Boeing does meet its schedule (and the company is confident that it can), Defence believes it can declare Initial Operational Capability (IOC) by the end of 2011.

Concurrently, the *Wedgetail* Operational Flight Trainer (OFT—the cockpit simulator) has been accepted into service at Williamtown. The Operational Mission Simulator (OMS), AEW&C Support Facility (ASF) and Mission Support Segment (MSS), also located at Williamtown, are on schedule for handover in November 2009 to support the start of training.

The difficulties with the EW system, for which BAE Systems Australia is Boeing's principal sub-contractor, are partly technical and partly programmatic. Re-designing the AP-3C *Orion*'s proven and effective ALR-2001 Electronic Support Measures (ESM) system so that it could be integrated on the B737 airframe was extremely challenging. However, there are few significant technical issues outstanding and it should be complete in 2010.

With hindsight a six-year development and production schedule under a fixed price contract was probably unrealistic for Project *Wedgetail*...

By way of historical comparison, Boeing was awarded its initial contract to develop the US Air Force's AWACS system in July 1970; the Westinghouse (now Northrop Grumman) APY-1 radar was selected as the primary sensor after a competitive fly-off in 1972 against Hughes (now Raytheon), and Full-Scale Engineering Development of the complete AWACS began in 1973. The first of 32 aircraft procured under this 'fly before buy' program was delivered in March 1977. Importantly, however, development of the competing radars had begun as far back as 1967. Also, before selecting the radar transmitter the USAF mandated the use of Northrop Grumman's electronically scanned antenna, the revolving dish mounted above the E-3's fuselage, which had already undergone considerable development.

The ten years between the start of radar development and delivery of the first AWACS roughly mirrors the current schedule of the *Wedgetail* program. With hindsight a six-year development and production schedule under a fixed price contract was probably unrealistic for Project *Wedgetail* and reality is simply re-calibrating the stakeholders' expectations.

Giving the Hornet a HUG

Gregor Ferguson

Australia's track record of extending the lives of ageing aircraft remains intact. When the last of the RAAF's F/A-18A/B *Hornets* retires in around 2018 (possibly later) they will have been in service since 1985 and yet may still be the most capable 'classic' *Hornets* in service anywhere in the world.

There's also a possibility the *Hornet* may serve a couple of years beyond this date, depending on the delivery schedule for the F-35A *Lightning II* Joint Strike Fighter which is supposed to replace it. But the *Hornet* is unlikely to achieve the iconic status of the F-111, which is due to retire in 2010 after thirty-seven years' service. (And both will fall well short of the US Air Force's Boeing B-52s, some of which are scheduled to have been in service for eighty years before retirement around 2040.)

When the last of the RAAF's F/A-18A/B Hornets retires... [they] may still be the most capable 'classic' Hornets in service anywhere in the world.

When it entered service the *Hornet* fighter combined with the F-111 strike aircraft made the RAAF the pre-eminent air power in the Southwest Pacific region. However, after decades of regional stability and economic growth, many regional air forces started introducing modern combat aircraft and missiles during the 1990s. Barely ten years after entering frontline service, the *Hornet*'s shortcomings were being exposed by more modern aircraft such as the Royal Malaysian Air Force's Mig-29 *Fulcrums*.

Although the *Hornets*, like the F-111s and other key ADF assets, were intended principally for the defence of Australia, successive crises outside our immediate region highlighted how unprepared the ADF was to deploy further afield. While our immediate region is relatively benign, the ADF has been required regularly to contribute to coalition operations in the Middle East and Africa during the 1990s and early 21st century. All too often the threat environment has been assessed as too hostile for the *Hornet* and F-111, which have lacked the electronic warfare self-protection equipment required to confront emerging air defence systems. This lack of preparedness meant the government had few viable military options available to it and little control of operational risks if it chose to deploy ADF units.

In particular, the *Hornet* lacked the secure 'connectivity' to be an effective member of a US-led coalition: it couldn't share targeting data with US and other coalition aircraft and command centres and therefore couldn't participate safely in an increasingly networked and automated 'kill chain'. It also lacked the modern air-air and strike weapons required in this construct. The accuracy and discrimination of 'smart' weapons, in particular, are essential for delivering precise effects with the minimum risk of collateral damage, as required under the laws of armed conflict in the counter-insurgency like campaigns in which the ADF has been involved.

To help rectify this, the past decade has seen considerable investment by the ADF in the restoration of the *Hornet*'s relative capability edge through a series of upgrades of just about everything except its airframe and engine. This program is dubbed Project AIR 5376 – *Hornet* Upgrade (or HUG). In parallel, the ADF has also been investing in new air-air and air-surface strike weapons, airborne early warning, new aerial

refuelling tankers and improved command and control. This program, worth over \$10 billion in all (the *Hornet* HUG alone is worth \$3.4 billion), will deliver an air combat force that's capable for the first time in nearly two decades of operating semi-independently and surviving contemporary air defence threats.

The F/A-18A/B *Hornet* is a supersonic, twin engined multi-role fighter designed originally for the US Navy to carry out air-air as well as strike and ground attack operations. The RAAF ordered 75 *Hornets* with only very minor deviations from the standard US Navy configuration. Much of the thrust of the HUG has been to incorporate improvements which the US Navy had introduced with its modernised F/A-18C/D model, although Australia's circumstances have also demanded some unique HUG modifications to restore and extend its combat edge.

The scope and structure of the seven-phase HUG reflects the conventional wisdom that a modern combat aircraft derives its advantage from features such as advanced weapons and sensors, Electronic Warfare (EW) and 'connectivity' between individual aircraft and their command and control centres. The only airframe modifications are designed to fend off encroaching metal fatigue and extend the lives of the aircraft.

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Phases 1 and 2.1 of the HUG saw the service's 71 remaining *Hornets* modified to carry new and significantly more effective ASRAAM short-range air-air missiles, AMRAAM medium-range air-missiles, and a new radar, navigation system and mission computers. Aircraft which had undergone this upgrade were deployed to the Middle East as part of the US-led coalition against Iraq in 2003. They still lacked a number of survivability features which are now considered essential, but after a careful threat analysis, the *Hornets* were deployed (into a relatively benign environment) under the protective umbrella of the US Air Force and Navy.

Phase 2.2 saw the *Hornets* equipped with new data links, colour cockpit displays, an upgraded countermeasures dispenser and the US-made Joint Helmet Mounted Cueing System (JHMCS). This enables the pilot to select and designate targets for air-air missiles just by turning his head. The datalink upgrade enables the *Hornets* to exchange radar and target data with each other and with other coalition assets such as early warning aircraft and ground control centres in real time. Although it doesn't sound spectacular, this has been one of the HUG's most significant combat capability enhancements, as well as the most technically demanding.

Phase 2.3 will see the *Hornets* equipped with a new suite of Electronic Warfare Self-Protection (EWSP) equipment to dramatically improve its survivability against a range of modern threats; in fact, some 16 aircraft have already undergone a partial upgrade to meet operational needs and the entire fleet will get the full upgrade, including EWSP equipment previously only fitted to the *Super Hornet* and F-111, commencing mid-2009. And under Phase 2.4 the RAAF will fit 42 *Hornets* with the Rafael/Northrop Grumman Litening laser and infra red targeting pod to enable

precision strike operations by day and night. All of these changes will be mirrored faithfully in upgraded flight simulators.

All these modifications are designed to ensure the *Hornets* are capable of fighting and surviving in a much more hostile environment even than Iraq in 2003, let alone 1991. Boeing Integrated Defense Systems in the US was made prime contractor for the HUG with much of the HUG production work and all of the deep maintenance to be carried out at Williamtown by the Hornet Industry Coalition (HIC), comprising Boeing Australia, BAE Systems Australia and Canadian firm L-3 Communications MAS, which has unrivalled knowledge of *Hornet* airframe maintenance and repair.

The airframe upgrades under Phase 3 of the HUG were designed to ensure that the *Hornet* could remain in service through the transition to the JSF, with a planned retirement date of 2018. Under Phase 3.1, some forty-five aircraft have undergone minor airframe repairs and modifications to rectify minor fatigue issues and general wear and tear pending a more ambitious structural upgrade under Phase 3.2.

... doubt arose during the 1990s about the exact life of the *Hornet* under Australian and Canadian conditions.

Although the *Hornet* was designed for the rigours of taking off and landing aboard aircraft carriers, most other operators use the aircraft quite differently from the US Navy and Marines and doubt arose during the 1990s about the exact life of the *Hornet* under Australian and Canadian conditions. A joint Australia-Canada International Follow-on Structural Test Program (IFOSTP), begun in 1989, discovered in 2001 that the *Hornets*' centre fuselage section, or centre barrel, to which the wings and main undercarriage are attached, were starting to crack earlier than predicted by the US Navy and Boeing.

In 2003 then Defence Minister Senator Robert Hill announced Phase 3.1 of the HUG, and foreshadowed a centre barrel replacement for fifteen *Hornets* under Phase 3.2. At this time the planned withdrawal date for the *Hornet* was 2012-15; when this was extended to 2015-18 to cover introduction of the F35A, Phase 3.2 was re-scope for 49 centre barrel replacements.

L-3 Communications MAS was already replacing centre barrels on Canadian *Hornets* at its Mirabel facility in Canada and won the contract to design a similar repair scheme for the RAAF. Basically, the airframe is stripped to its components, the old centre barrel is scrapped and a new one manufactured by Northrop Grumman is inserted. The airframe is then re-assembled and test flown. The first two Australian airframes were sent to Mirabel in 2006 and 2007, respectively, to prototype the upgrade. Both are now back in service.

The plan was that these prototypes, followed by eight Low-Rate Initial Production (LRIP) aircraft, would be modified at Mirabel and the remainder by the HIC at Williamtown. The eight LRIP aircraft are currently undergoing the modification but it was announced in 2008 that no further *Hornets* will have their centre barrels replaced. This was a consequence of new and better data becoming available.

While planning for Phase 3.2 was getting under way in 2007, the DMO set DSTO the challenge of extending the safe service life for the *Hornets* by a further two years. The reason was that *Hornet* availability would dip alarmingly when aircraft were being cycled through the various concurrent HUG phases, threatening RAAF combat capability. The DMO wanted schedule flexibility to avoid this problem and a bit more airframe life would provide this.

DSTO fortuitously obtained eight scrap *Hornet* centre barrels from the US and Canada, along with two scrap centre barrels from the RAAF prototype *Hornets* and performed an accelerated fatigue test to see how long it took for the cracks to propagate and for the centre barrels to fail. Testing eight centre barrels provided for the first time ever a strong statistical base for fatigue life prediction: and they found these components could be kept going far longer than anybody though—the *Hornets* got an extra two years of safe life, sufficient to see the fleet through to 2018 and slightly beyond.

Unfortunately, this news didn't arrive in time to prevent Phase 3.2 going ahead. The total estimated cost of Phase 3.2 was about \$850 million, much of this being non-recurring design, tooling and set-up costs; the decision not to re-barrel 39 aircraft saved the Commonwealth some \$400 million.

With less than ten years' service life remaining, the *Hornets* are now being maintained by industry at Williamtown. However, the HIC was disbanded in late-2007 because the DMO felt it could get better value for money by competing the separate components of the HUG and deep maintenance. The DMO opened up the deep maintenance contract to competition in 2008. Boeing squared off against BAE Systems Australia, teamed with L-3, and lost. The contract was signed in April 2009 and Phase 3.1 of the HUG is being implemented by the winning team as part of the aircraft's regular cycle of deep maintenance. Boeing Australia's hands-on role on the HUG is now confined to implementation of Phase 2.3.

The HUG has restored the *Hornet*'s combat edge; its combat value has also been extended by the acquisition of the ASRAAM and AMRAAM missiles, along with the Joint Air-Surface Stand-Off Missile (JASSM), a stealthy, 200nm range cruise missile which is already being flight tested aboard the *Hornet* in Australia. While much of the HUG has simply brought the *Hornets* up to the operational standard of the US Navy's aircraft, Australia is the first and so far only *Hornet* operator to order and integrate the ASRAAM and JASSM missiles and such greatly enhanced EWSP capabilities. The new missiles in particular take the *Hornet*'s air-air combat and strike prowess to new levels, which will be surpassed in due course by the *Super Hornet* and JSF.

If the RAAF upgrades some of its *Super Hornets* to EA-18 *Growler* electronic attack variants (see separate report earlier) these will be able to escort Australian and coalition fighters and strike aircraft, suppressing enemy air defences by jamming airborne and ground based radars to clear a safe path.

[The] air combat force [is] being readied for an unpredictable and far more threatening environment than when the *Hornets* were originally ordered.

This level of capability will be unprecedented in the RAAF and unique within the region. While it is to some degree the inevitable result of introducing a new generation of combat aircraft, the deliberate choice of the JSF to replace the *Hornet* rather than lower-risk alternatives such as the *Super Hornet*, *Typhoon*, *Rafale* or *Gripen*, and its crucial ‘enablers’ such as the *Wedgetail* AEW&C system speaks of an air combat force that’s being readied for an unpredictable and far more threatening environment than when the *Hornets* were originally ordered. It also speaks of a force able to offer the government the option of independent action, or leadership of a coalition, without the comfort of a US air umbrella.

The full effect of the HUG will come into service during 2009-10, at which point the *Hornets* will be augmented by the new *Super Hornets* followed some four or five years later by the JSF. The RAAF plans to implement the same ongoing upgrades to its *Super Hornets* as the US Navy, while the JSF will be the subject of regular block upgrades and enhancements. If Defence sticks to its plans to upgrade incrementally the combat capabilities of these new aircraft the *Hornet* HUG should be the last major combat aircraft upgrade of its kind undertaken in Australia for at least a generation.

Australia's new lightweight torpedo—lessons learned

Gregor Ferguson

Beware of hidden costs: that would be the most important lesson Defence can take from Joint Project JP 2070—lightweight torpedo. But another equally important lesson has been to assign responsibility for integrating platforms and new weapons to the organisation best equipped for the task.

... the torpedo is still only integrated with the RAN's... frigates, only a single verification firing of the weapon has taken place, and it hasn't been integrated with any of the airborne platforms it was intended for.

JP 2070 was established to replace the RAN and RAAF's obsolescent US-built Mk46 Mod5 lightweight anti-submarine torpedo with an all-new weapon, the EuroTorp MU90 *Impact*. This was selected in 1999, and the 'Djimindi' Alliance contract between Defence and the industry stakeholders was signed in 2000. However, the first batch of torpedoes didn't arrive in Australia until 2008 and, as of April 2009, the torpedo is still only integrated with the RAN's frigates, only a single verification firing of the weapon has taken place, and it hasn't been integrated with any of the airborne platforms it was intended for.

This project, whose three phases are worth over \$616 million, has taught all parties some important lessons. Acquiring a new weapon, especially one that is still under development as the MU90 was when ordered by the ADF, carries an inherent burden of risk. That risk was compounded by the need to integrate the MU90 with no less than five separate air and surface platforms: the RAN's FFG and ANZAC Class frigates and *Seahawk* and *Super Seasprite* helicopters, and the RAAF's AP-3C *Orion* patrol aircraft.

So why did Australia select the MU90? Essentially, because of its superior homing ability, range and shallow-water capability, including its ability to be dropped from a helicopter or aircraft into water less than 25m deep. And all three contenders for the lightweight torpedo contract (the others were the US Navy's Mk54 and the Royal Navy's *Stingray*) would have faced the same integration challenges. In fact, France and Italy between them plan to integrate the MU90 on no less than ten separate air and surface platforms.

The sole Australian firing to date of an MU90 has reportedly vindicated Defence's choice of the weapon. This took place in June 2008, when HMAS *Toowoomba*, an ANZAC frigate, launched a torpedo successfully off the west coast of Australia. The torpedo performed 'as advertised' (details are classified), and a second firing from one of the upgraded FFGs was planned for May 2009 off the east coast. However, with no ships available for the trial, this has been put back to November. Defence doesn't believe there is any residual risk attached to the integration onto the FFG, but needs to formally verify the integration outcome as well as the weapon's performance.

Meanwhile, any decision on whether and when to integrate the MU90 with the *Seahawk* and *Orion* is still awaiting the 2009 Defence Capability Plan and its guidance on the life of type of these aircraft and the level of investment that it's worth

making in them. But the 2009 White Paper explicitly emphasised the need for an enhanced Anti-Submarine Warfare (ASW) capability and the intention to acquire at least 24 new ASW helicopters as a matter of urgency. It is not clear what this means in terms of the ASW weapon they will carry.

Project background

The Djimindi Alliance was set up to handle the complexities of multiple, concurrent integration programs. It consists of the Commonwealth of Australia, Sydney-based Thales Underwater Systems Pty Ltd and EuroTorp, itself a joint venture between French firms Thales and DCNS and Italian torpedo manufacturer Whitehead Alenia Sistemi Subacquei (WASS).

The Alliance has proved a helpful mechanism for resolving technical and commercial issues during the development of the project. In particular, the Commonwealth's membership helped situate (and equally importantly maintain) the project within the comfort zones of both Defence and its counterparts in Paris and Rome. At government level the relationship between these nations has been strong and supportive and was instrumental in securing access to French and Italian technical and trials data when this was required.

However, the gain-share, blame-share philosophy underpinning the Alliance structure didn't cope well with the technical and resulting commercial challenges the project encountered during the middle of the decade. In 2005 the DMO renegotiated the agreement and also established a separate and more traditional DMO-only Project Office outside the formal Djimindi Alliance structure to handle some of the program management aspects of the project.

... the gain-share, blame-share philosophy underpinning the Alliance structure didn't cope well with the technical and resulting commercial challenges the project encountered

Aside from a serious technical issue with the MU90 which the contractor took some time to deal with, Defence also unknowingly set some traps for itself, and duly fell into them. The first was to make the project responsible for both acquiring the weapon and integrating it with the various platforms. The second was to under-estimate significantly the cost and complexity of platform integration.

The Alliance needed access to the platforms to undertake planning, design, integration and testing and this access needed to be negotiated with the DMO's respective platform Systems Project Offices (SPOs). While there was plenty of cooperation between them, all of the platform SPOs were at different times heavily pre-occupied with their own development or upgrade programs, so harmonising schedules and priorities was difficult. The Alliance carried the responsibility for achieving goals when it frequently lacked the authority to impose schedules and priorities on the DMO and other Defence players.

That said, production difficulties with the MU90 itself delayed platform integration on the FFGs and ANZACs by some 18 months. Qualification testing of the MU90 in Europe was conducted using pre-production weapons; in the early-2000s after some

anomalous and unsuccessful test firings of early production examples the French and Italian governments ordered a Technical & Industrial Action Plan (TIAP)—a series of firings of production-standard torpedoes to validate the weapon’s performance in its final configuration. These took place in 2005–06, after the DMO had signed the contract for platform integration and the initial batch of weapons under Phase 2, and about the time it signed the Phase 3 contract for deliveries of war stocks.

These difficulties were a trigger for renegotiation of the Alliance agreement as well as contract payment milestones. Defence also told EuroTorp to delay deliveries until the TIAP was complete and the weapon’s performance validated. The first Phase 2 weapons didn’t arrive in Australia until 2008.

It was always planned that the frigates would receive the new torpedo first and the knock-on effect of the TIAP delay meant that key decision-making milestones in the *Orion* and *Seahawk* integration programs were delayed, and then became sucked into the orbit of the looming Defence White Paper and put on hold.

The second trap has been a bugbear of Australian defence contracting for years. Integrating a modern, high-technology guided weapon with any sort of platform can be extraordinarily complex and estimating the cost and schedule for it is difficult. Budget estimates for integration of the MU90 with its platforms were drawn up during the mid-1990s, and based on manifestly inadequate estimating and modelling, as well as over-ambitious requirements. While ship integration proved relatively trouble-free, the project simply didn’t have enough money in its budget for the level of integration the RAAF wanted with the *Orion*.

Integrating a modern, high-technology guided weapon with any sort of platform can be extraordinarily complex and estimating the cost and schedule for it is difficult... the greater the level of integration sought, the longer and more expensive the process will be.

Applying lessons

The DMO recently formed a new Explosive Ordnance Division (EOD) to help address and apply lessons from JP2070 and other projects. One of these is that platform Systems Project Offices (SPOs) should be made responsible for integrating new weapons, and given the budget to do so. EOD will remain responsible for procurement and in-service support, unless there’s a compelling case to do otherwise.

A second lesson is that Defence must take into greater account the very significant costs and schedule implications of integrating, maintaining and upgrading complex guided weapons: the greater the level of integration sought, the longer and more expensive the process will be. Underestimating these in the past has damaged DMO projects significantly, as well as ADF operating budgets and operational capabilities. As platforms and weapons grow more complex these sorts of errors are unaffordable and unjustifiable.

This was the case with the *Orion*. The RAAF wanted the most complex and expensive option: full integration of the MU90 with the *Orion*’s mission system, which would see the weapon draw all of the necessary data for a successful engagement direct from

the ship or aircraft, including platform navigation data such as location, heading, altitude and attitude; target data such as location, course, depth and speed; and search and safety parameters. Manual inputs, beyond essential safety and launch commands, are kept to a minimum.

For the FFGs and ANZAC frigates, the RAN has opted for what it terms ‘partial plus’ integration. Information such as target location, TADIL (Link 11) and platform navigation data are passed directly to the weapon, but some target and search parameters are entered manually through a Pre-Setter panel aboard the ship.

Air platform integration issues

From the start, Defence planned to develop an all-new Common Torpedo Control Unit (TCU) to enable full integration of the MU90 with the *Orion*, *Seahawk* and *Super Seasprite*. No such TCU previously existed and development efforts were focussed on a variant of the Airborne Pre-Setter (APS) which WASS had developed to provide rather lower levels of integration between the MU90 and the Italian Navy’s AB212, EH101 Merlin and, eventually, NH90 NFH helicopters.

There were some significant flaws with this plan. Different aircraft have different amounts of space for both the ‘black box’ and the data entry panel; they inflict different extremes of temperature and vibration. Reconciling CTCU engineering specifications and user requirements across three different ADF platforms and two different services become a nightmare. Furthermore, an all-new CTCU would need lengthy and very expensive validation, qualification and regression testing to meet the demands of flight and ordnance safety. Leading the development of the CTCU was the P3 Accord, a tripartite team comprising the DMO’s Maritime Patrol SPO, BAE Systems (formerly Tenix Defence) and Australian Aerospace which was set up to sustain the *Orion* throughout its life of type.

The estimated cost of full integration between the MU90 and the *Orion* came as a rude shock. Since JP2070 got under way, however, the French Navy and Industry have developed and fielded a new TCU to enable Partial Integration of the MU90 with its Dassault *Atlantique* ATL2 maritime patrol aircraft. Eurotorp and the P3 Accord estimate that adapting it for the ADF will cost about one third of developing an all-new CTCU; they have offered this in an unsolicited proposal to the DMO. At the time of writing all parties were awaiting the White Paper before making any decisions.

Planning the next stage

The urgent *Seahawk* replacement program foreshadowed in the 2009 White Paper suggests it might be more cost-effective to leave this aircraft with the Mk46 torpedo and integrate the MU90 with whatever helicopter replaces it. There are two contenders, the MH-60R (*Romeo*) *Seahawk* from the United States and the European NH90 NFH. The latter is already integrated with the MU90 while there is plenty of time to integrate the torpedo with the former—although the cost and schedule again remains unknown until a detailed appraisal is made.

The *Orion*'s planned withdrawal date is 2018—distant enough (probably) to justify integration with the MU90, except for the fact that it will be replaced by the US Navy's new P-8A *Poseidon* maritime patrol and response aircraft. In order to avoid unnecessary integration risks, Defence intends to stick as closely as possible to the standard US Navy configuration for this aircraft, so the *Poseidon* will likely be armed with the US Navy's Mk 54 torpedo when it enters RAAF service from 2016.

Should Defence integrate the MU90 and *Orion*, or should it acquire initial stocks of the Mk54 instead and integrate this with the *Orion*, knowing that the torpedo will remain in the inventory once the *Orion* is replaced? Or, if other potential operators of the *Poseidon* would prefer to integrate the MU90, might there be a strong case for Australia sharing the costs and risks of doing this? And how will the choice of helicopter affect the decision—the *Romeo* will carry the Mk54 in US service?

Maintaining a diversified inventory of complex weapons with duplicated shore-based maintenance, test and repair facilities is expensive. Defence would clearly prefer to have a single lightweight torpedo in service, if possible.

Maintaining a diversified inventory of complex weapons with duplicated shore-based maintenance, test and repair facilities is expensive. Defence would clearly prefer to have a single lightweight torpedo in service, if possible. It's very likely the MU90 will be the default choice of lightweight torpedo for the AWD and the AWD Alliance is already discussing platform integration issues directly with Eurotorp.

But there's also a case for considering the manned maritime patrol aircraft fleet as a special case with a unique torpedo inventory, and settle instead for having the MU90 on the RAN's new helicopters and all of its surface combatants, including the new Hobart-class Air Warfare Destroyer (AWD). Notwithstanding the 'overhead' associated with a diversified inventory of weapons, a cost-benefit analysis of acquisition, integration and through-life sustainment costs and associated risks may conclude this is the best solution.

As for the other elements of JP2070, Phase 2 will see the initial batch of weapons for the RAN manufactured in Europe and the establishment of an in-country MU90 Torpedo Final Assembly Facility as part of the RAN's existing Torpedo Maintenance Facility at HMAS Stirling in WA. This will also be used to assemble torpedoes acquired in Phase 3 and to support and upgrade the torpedo through its life of type. Deliveries of so-called 'war stocks' of torpedoes under Phase 3 is due to get under way in September 2010.

The industry benefits to Australia from this project are not insignificant: under a sub-contract from its French parent, Thales Underwater Systems (TUS) in Sydney will be EuroTorp's global sole source of MU90 homing head transducers and electronic boards, with production due to begin in 2009. The company is also undertaking final assembly of the torpedo's battery section for all global customers under a sub-contract from DCNS.

Also the Propulsion systems and Control and guidance sections of the MU90 are assembled and tested by SITEP Australia in Sydney. SITEP has awarded Adelaide-based Lovett Engineering and Production Parts of Melbourne significant

subcomponent manufacture contracts. Once Phase 3 deliveries are complete these companies may also become part of the EuroTorp global supply chain.

Tactical UAVs—should we rent instead of buying?

Tom Muir

Under Joint Project JP 129—Tactical Unmanned Aerial Vehicle (TUAV), the ADF intended to acquire a system to enhance the reconnaissance and surveillance capabilities of deployed forces for both land operations and selected maritime operations. Use of a pilotless aircraft would overcome the limitations of mobility, terrain and range of current reconnaissance and surveillance capabilities.

The system would fill capability gaps identified in the Army's Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR) architecture by providing:

- a Near Real Time (NRT) reconnaissance capability for a deployed Joint Task Force
- an integral, responsive and accurate target acquisition system capable of providing a NRT sensor-to-decider-to-response asset link
- a Battle Damage Assessment (BDA) capability.

The RFT (request for tender) was released in late July 2004, with bids due by November that year. Source selection was to be completed by July 2005 with contract award expected towards the end of that year. The system was to be operationally available by early 2008.

The ambitious system sought comprised two Tactical UAV mission systems, each consisting of four air vehicles (AVs), two ground control stations with ground data terminals providing LOS command and control links to the AV, and four remote viewing terminals. The aircraft was to have a radius of action of at least 150km and up to 24 hours endurance and it was anticipated that both fixed and rotary wing configurations would be considered, as well as a variety of launching and recovery methods. These included conventional wheeled take-off and landing, vertical take-off and landing, catapult launch and parachute recovery. The Tactical TUAV capability was to be operated by a new Surveillance and Target Acquisition Regiment located at Enoggera Barracks in Brisbane. This new regiment would comprise the existing 131 Surveillance and Target Acquisition Battery together with a Combat Support Services Battery.

In December 2006, Boeing Australia, teamed with Israeli Aircraft Industries, was awarded a \$145 million contract for the TUAV capability provided by the IAI *I-View* 250A system. *I-View* offered multiple EO/IR payload options with the option to fit a Synthetic Aperture (ground-looking) Radar; Tactical Common Data Link (TCDL) and EPLRS communications systems to ensure both joint and coalition interoperability, and a highly advanced ground control station fitted to standard Army vehicles.

Follow-on reports indicated that this combination of sensor flexibility, integration with Australia's C4ISR systems via Boeing, and risk reduction at landing where many UAVs are lost, were instrumental in *I-View* winning the contract.

... would [the JP 129 solution] have applicability in the sort of low level, but equally dangerous operations, that appear to be a growing feature of current and likely future ADF deployments? Probably not.

So it appeared that JP 129 would provide the sort of capability a Joint Force might need on fairly major (and presumably infrequent) operations, but would it have applicability in the sort of low level, but equally dangerous operations, that appear to be a growing feature of current and likely future ADF deployments? Probably not. And due to significant delays with the JP129 program, which included seemingly insurmountable technical difficulties, (which we suspect included intransigence over the transfer and integration of US technology into an Israeli system) a so-called interim TUAV capability was introduced by the fielding of two systems, the man-portable Elbit *Skylark* system and the Boeing-Insitu *ScanEagle*.

When the technical difficulties proved irreconcilable, in September last year the JP129 program was cancelled. In his announcement, Defence Minister Joel Fitzgibbon said that the DMO and Boeing Australia had agreed to terminate the contract on what were said to be mutually acceptable terms. He then went on to say that this ‘decisive action’ would enable Defence to focus on the earliest acquisition of an alternative TUAV to meet the JP129 requirement, noting that the Army would continue to use the *ScanEagle* currently inservice in the Middle East. A further contract for *ScanEagle* services was subsequently signed with Boeing.

This suggests that, despite ongoing access to a contracted service, which we understand was introduced as an interim capability due to delays with JP129, consideration is now being given to re-issue a tender for a TUAV capability not only to meet operational needs in the Middle East (currently handled by the contracted service) but also for longer term requirements.

If this is so, one has to ask why do we again need to study, evaluate and acquire a TUAV, introduce it into service and raise and train a corps of handlers, when the contracted service presumably meets current operational requirements? This is not to say that *ScanEagle* is in the same class as the proposed JP129 TUAV capability—it clearly isn’t—but if *Global Hawk* can be dismissed so readily in the face of an obvious maritime surveillance need, should we not reassess our TUAV needs, perhaps in light of operational experience being gained with *ScanEagle*?

... why do we again need to study, evaluate and acquire a tactical UAV, introduce it into service and raise and train a corps of handlers, when the contracted service presumably meets current operational requirements?

Since further *Skylark* 1 systems have been ordered from Elbit, and Boeing’s contract to provide *ScanEagle* services in Iraq and Afghanistan has been extended, and appears to be virtually ongoing, it would be correct to say that elements of the ADF have now acquired considerable experience in the use of small tactical UAVs at the fireteam/section level, and more capable systems at the battlegroup/brigade level—a situation we feel should continue for higher echelon UAV capabilities when they are needed.

And will this ‘learning by doing’ process help shape the capabilities needed for counter insurgency and similar low level operations, and show the benefits of turnkey UAV services? Or will it be ignored in favour of acquiring a high-end system that may well be outdated—and possibly inappropriate to future missions—by the time it is introduced into service? There may very well be a case for accepting a lower-level capability, at least for the near- to mid-term, rather than to continue to pour money into a multi-million dollar equipment program that may be largely irrelevant to the type of hostilities our land forces are likely to face.

And there is a question of future growth paths to be considered. Locking the ADF into a particular and costly long term UAV capability at a time of rapid development of unmanned aerial systems and advances in the minaturisation of their payloads could prove to be short-sighted. A better answer would be to continue to hire unmanned aerial surveillance services from contractors prepared to supply and maintain, and if necessary upgrade, systems suited to the task in hand. While the current contracted service appears to suit our requirements in Afghanistan, any expansion of our forces may require the lease of systems more suited to the higher echelon command level.

In-field experience

Australia’s experience in contracted TUAV operation began back in 2006 when Boeing Australia was awarded a contract to provide reconnaissance and surveillance services to the Australian Army using the *ScanEagle*. These services were first used in southern Iraq by Australian soldiers operating with the Overwatch Battle Group (West) in Operation Catalyst. Within six months, Boeing was awarded a six-month \$20 million contract to provide *ScanEagle*-based services for Australian troops in Afghanistan.

By 2008, Boeing reported that the *ScanEagle* system had provided 10,000 hours of eye-in-the-sky surveillance and reconnaissance services to Australian Army forces in the two theatres. Elbit Systems has also received successive orders for its miniature *Skylark* UAV systems dating back to 2005, with a contract last year for its third *Skylark* order worth several million dollars.

But this country is by no means unique in its UAV contracting arrangements. Operational tasking in Afghanistan has pressured a number of participating countries to upgrade their UAV fleets through purchase and rental. Dutch forces, working closely with Australians forces in Oruzgan Province, are no exception. The Dutch acquired both *Aladin* and *Raven* mini-UAVs, and have retired their old *Sperwer-A* UAVs (which have also been taken out of service by Canada and Denmark) in favour of renting more up-to-date systems.

Operational tasking in Afghanistan has pressured a number of participating countries to upgrade their UAV fleets through purchase and rental, and Dutch forces, working closely with Australians forces in Oruzgan Province, are no exception.

In looking for a replacement for *Sperwer*, the Dutch authorities initially identified a need for two ‘air-ground reconnaissance capabilities’, one at the tactical level for

commanders on the ground, and another at the ‘operational level’ for theatre command intelligence. At first, both types of UAV requirements were handled and evaluated separately, and were estimated to cost less than €25 million each. However, further investigation led to a decision late last year that both requirements could be fulfilled in a single platform, under a €25 – 50 million program, if the higher-echelon requirements were relaxed slightly. The challenge was to find a solution meeting most of the needs, with enough UAVs for coverage and within the budget.

After issuing an international solicitation through the European Defence Agency online marketplace, the Dutch concluded that *Aerostar* system, offered by Israeli firm Aeronautics Defense Systems, was the only option that could fit their requirements, which included operating and maintaining the UAVs on the Netherlands’ behalf. Deemed an urgent operational requirement (UOR), a rapid acquisition arrangement has resulted in a €39 million contract for an *Aerostar* UAV service for use in Oruzgan Province, Afghanistan. Support is understood to be provided by the Elbit/Thales UAV Tactical Systems (UTacS) joint venture.

The United Kingdom also employs contracted UAV services in Afghanistan. To meet an urgent requirement for persistent ISTAR at the theatre/operational level in Afghanistan, the *Reaper* (formerly *Predator-B*) UAV was introduced into service in late 2007. *Hermes 450*—a formation/higher tactical level UAV capability—was also procured as a UOR and entered service from July 2007. The capability is provided as a service by the Elbit/Thales (UTacS) joint venture. The air vehicle is launched by a contractor-provided external pilot and operated throughout the mission phase by Royal Artillery personnel, with control handed back to the contractor for the recovery and landing. Servicing and support are the contractor’s responsibility.

Hermes 450 operates at slower speeds and lower altitudes than *Reaper*. Up to 10 air vehicles and 6 GCS are being used, providing FMV ISTAR support in Iraq and Afghanistan with two concurrent missions possible in both theatres.

Somewhat akin to the ADF’s use of *Skylark*, for the lower tactical level *Desert Hawk 3* was also procured under UOR procedures in 2007. It is a hand-launched system that has an endurance of around 60 minutes. A total of 18 systems (144 air vehicles and 18 GCS) have been deployed in both Iraq and Afghanistan, providing FMV ISTAR support to Battlegroup operations and below. The capability is operated by Royal Artillery personnel embedded in Battlegroups. A further five systems are being procured.

To meet its immediate needs for surveillance and intelligence gathering in Afghanistan, Canada like Australia, leased *ScanEagle* UAVs from Boeing. The nine-month, C\$14 million turnkey service contract was signed in May 2008 and the UAVs have been in Afghanistan since June, according to the Department of National Defence (DND).

To fill the gap between the decommissioning of the *Sperwer-A* fleet and the anticipated purchase of new unmanned aerial systems, the DND raised Project Noctua, a UAV lease program which aimed for a contractor providing the systems, as well as maintenance crews, in Kandahar by February 2009. Under Noctua, MacDonald, Dettwiler & Associates were awarded a C\$95 million contract for the

two-year lease of an IAI *Heron* medium-altitude long-endurance UAV system to be delivered to Afghanistan by early 2009. The UAV lease will be completed by the end of 2010, with an option to extend for an additional year. The UAV began serving Canada in Afghanistan, under an arrangement that parallels Britain's interim lease of *Hermes* 450 UAVs from Thales UK and Elbit Systems.

The Noctua project did not stipulate that the winning company should provide a certain number of UAVs. Instead, the performance contract required enough air vehicles for a particular capability over a certain period of time. It also required the UAVs to be capable of being on station for 12 hours, gathering high-quality imagery as far away as 100 kilometers from Kandahar.

One of the leased *Herons* was involved in a tarmac mishap at Kandahar Airfield—an incident that has raised questions about accountability when private contractors are deployed on to the battlefield. The accident, believed to be a tarmac collision with a vehicle from another allied nation, was a minor setback, but reportedly left Canadian defence officials at a loss to define where public accountability ends and corporate confidentiality begins.

A senior Canadian defence official is reported as saying that the trend towards leasing and more private involvement, in providing services to the military, would 'likely accelerate' in the coming years. This is because the pace of technological change and the cumbersome procurement process mean sophisticated weapons systems are sometimes outdated before they are introduced into service.

Conclusion

It seems inevitable that UAV services, run by adaptable and experienced providers, like many other turnkey operations, will find growing demand by military customers on an 'as and when required' basis. Such services will be provided under performance contracts which specify flight endurance, rate of effort, data link bandwidth levels and so on. Such systems would have to be compatible with the customer's forward observer and other data management equipment. This being the case, is there any justification for pursuing a JP129 replacement system?

It seems inevitable that UAV services, run by adaptable and experienced [civilian] providers... will find growing demand by military customers on an 'as and when required' basis.

Thinking more broadly, the concept of contracted services for broad-area high-altitude surveillance should not be discounted too readily. Hiring such a capability could well be a most useful precursor to the subsequent introduction of a fully fledged, wrinkle-free capability into service.

SECTION 9 – AUSTRALIA’S FOREIGN AID

Australia’s foreign aid is administered by the Australian Agency for International Development (AusAID). The aim of Australia’s aid program is ‘to assist developing countries reduce poverty and achieve sustainable development, in line with Australia’s national interest’.

Australia’s strategic interests are an important subset of its national interests. In this Section, we examine the overall foreign aid program with a focus on how it furthers our strategic interests. Extensive details of aid initiatives in specific countries are available on the AusAID web-site www.ausaid.gov.au.

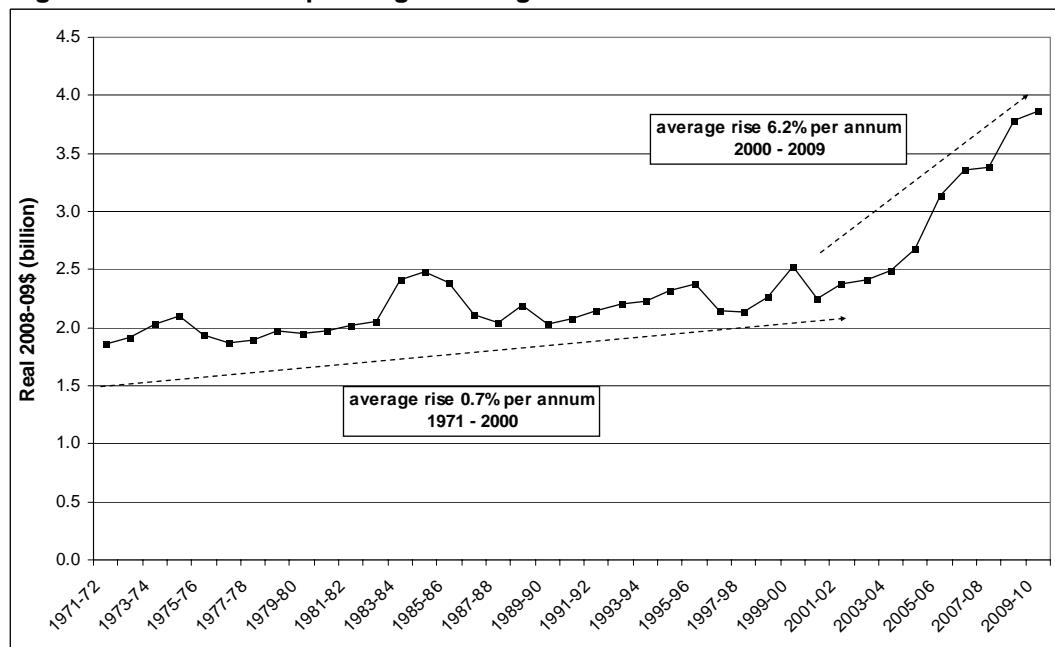
How much does Australia spend on foreign aid?

In 2009-10 Australian foreign aid will amount to \$3.8 billion corresponding to 0.34% of GDP. This represents a nominal boost of \$29 million on last year, and 2% annual growth in real terms (mainly because the deflator is negative). Not surprisingly, aid has been increased more slowly than previously planned because of the economic situation. Last year the plan was to achieve fully 0.35% of Gross National Income (GNI) in 2009-10.

Nonetheless, this year’s increase completes a decade of strong growth in the aid budget. Since 1999-00 foreign aid has increased in real terms by an average of 6.2% per annum—more than twice the underlying long-term growth in the Defence budget.

Things have not always been so favourable for Australian foreign aid. Prior to the present decade, aid spending grew relatively more slowly (0.7% per year in real terms) over the preceding 30 years. Figure 9.1 shows Australian foreign aid spending from 1971-72 to the present.

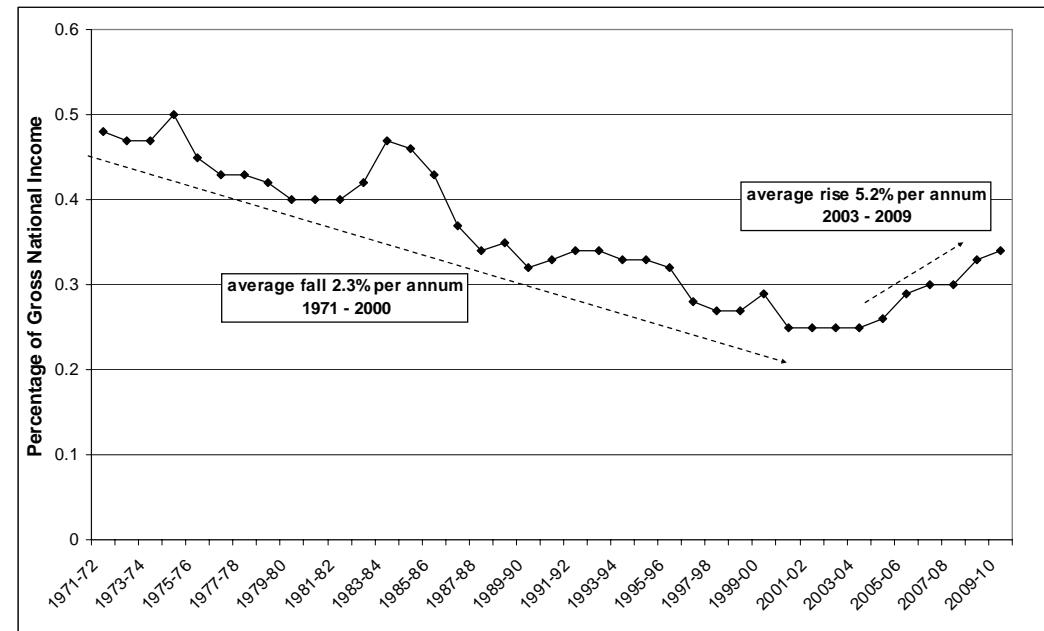
Figure 9.1: Australian spending on foreign aid 1971-72 to 2009-10



Source: 2009-10 Ministerial Statement on Australia’s International Development Assistance Program

In much the same way that defence spending is measured as a share of GDP, foreign aid spending is often measured as a share of GNI. Viewed in this manner, the falling priority accorded to aid from the 1970s to the 1990s is very clear as shown in Figure 9.2.

Figure 9.2: Australian foreign aid as a share of GNI 1971-72 to 2009-10



Source: 2009-10 Ministerial Statement on Australia's International Development Assistance Program

No doubt many factors contributed to a higher priority for foreign aid this century. From a strategic perspective, the eroding conditions in the fragile states on our periphery would be reason enough to do more.

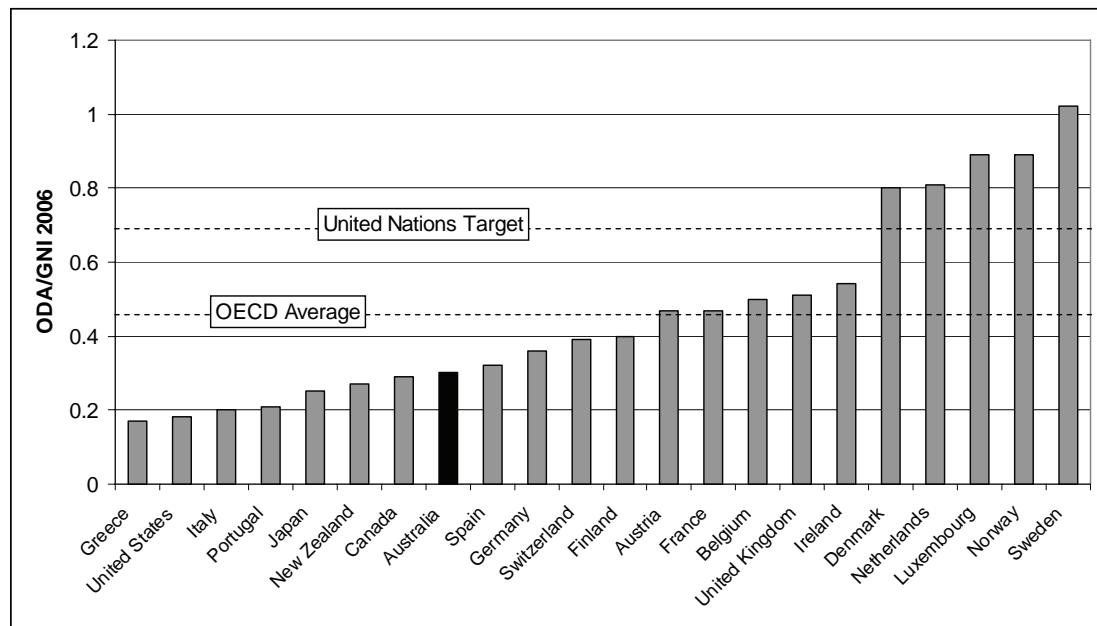
In international terms, Australian foreign aid spending is unimpressive. In 2006, the last year for which comparative data is available, Australia ranked 15th out of 22 OECD countries for aid as a share of GNI, see Figure 9.3. Not only do we fall below the average for industrialised nations, but our 0.34% of GNI is around half that of the agreed United Nations target of 0.7%. However, and consistent with its election commitment, the government plans for foreign aid to reach 0.5% of GNI by 2015-16. Specific targets for the next four years are set out in Table 9.1 along with our projection of what will be necessary for the government to fulfil its promise. Note the especially rapid growth required from 2012 to 2015 to reach the target.

Table 9.1: Overseas Development Assistance (ODA) to reach 0.5% of GNI by 2015-16

	Actual		Budgeted		Estimated			Projected		
	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
ODA/GNI	0.30%	0.30%	0.33%	0.34%	0.35%	0.37%	0.40%	0.43%	0.46%	0.50%
ODA (2008/09 \$b)	3.35	3.38	3.79	3.87	4.10	4.50	5.06	5.65	6.28	7.09
real increase	6.9%	0.7%	12.2%	2.0%	6.0%	9.9%	12.3%	11.7%	11.2%	12.9%

Source: 2009-10 Ministerial Statement on Australia's International Development Assistance Program. Note: projection assumes GNI grows at average 2% real.

Figure 9.3: Comparison of Official Development Assistance (ODA) from OECD nations

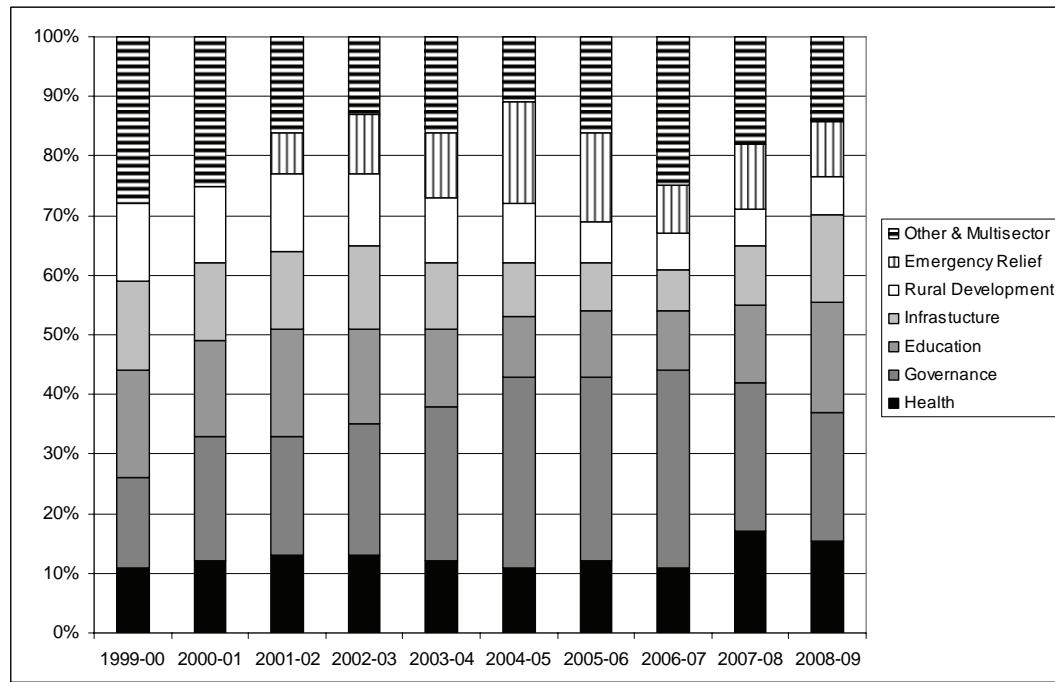


Source: 2008 OECD Factbook

On what is the money spent?

At the risk of greatly oversimplifying the complexity of Australia's foreign aid effort, Figure 9.4 sets out the gross categories of aid and how they have changed over the past decade. For our purposes, it is sufficient to note that governance is the largest single area of activity. This makes sense; good governance has a multiplier effect on development and is of strategic benefit to Australia in any case.

Figure 9.4: The composition of Australian foreign aid 1999-2009

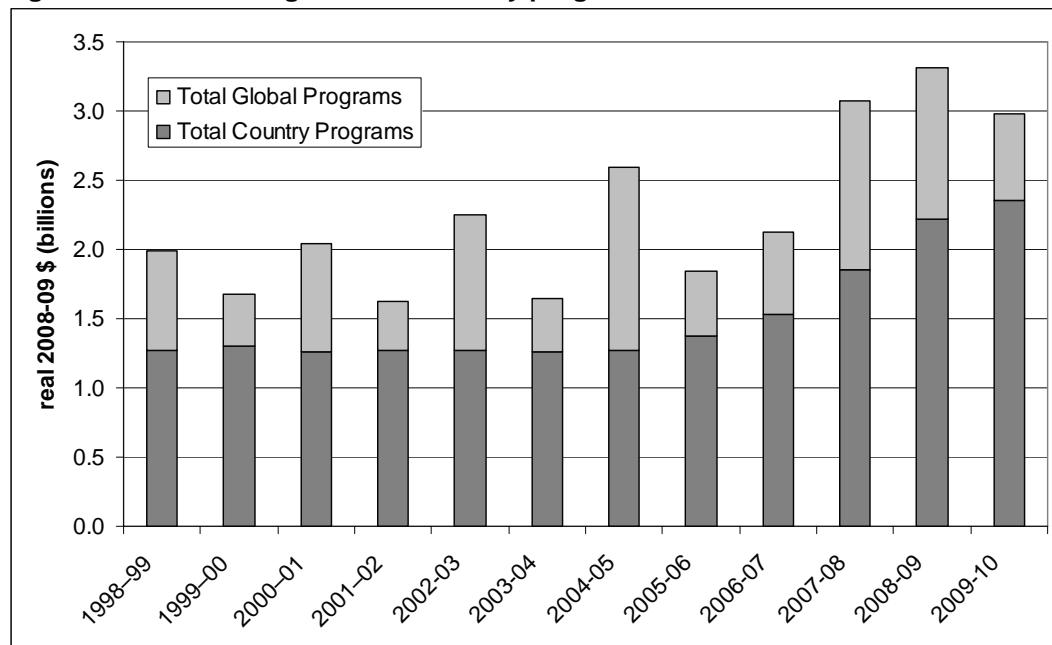


Source: AusAID annual reports and budget papers

Where does the money go?

The annual aid budget is composed of a country-specific program and a global program, see Figure 9.5. The latter includes payments to various development banks and UN and Commonwealth agencies including emergency aid through the World Food Program. Because of multi-year payments, the global program can vary greatly from one year to the next (accrual accounting smooths the payments in reporting).

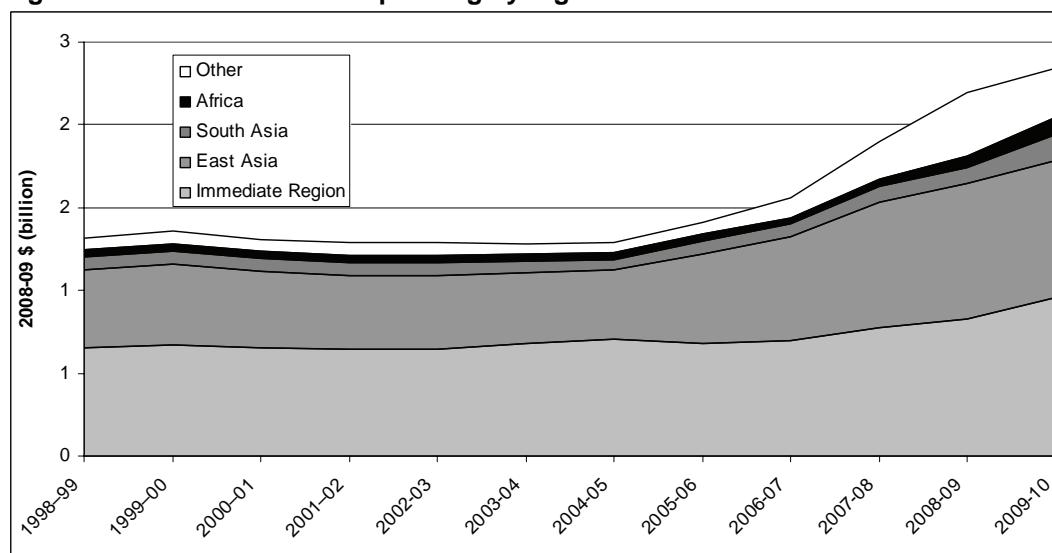
Figure 9.5: AusAID — global and country programs



Source: AusAID annual reports and budget papers

Australian country-specific aid is geographically focused on Asia, Pacific Island states, Iraq, the Palestinian territories and parts of Africa. Australia has no country programs in Europe, the Americas, or Western Africa. Figure 9.6 shows the size of country-specific aid by region since 1998.

Figure 9.6: Australian aid — spending by region 1998 - 2009



Source: AusAID annual reports and budget papers

All other things being equal, Australian aid tends to be greater for countries that are closer to Australia. The category of ‘immediate region’ includes the island states of the Pacific, PNG and East Timor. Though not shown, most of the aid to East Asia goes to Southeast Asia and to Indonesia in particular.

Although the broad distribution of aid over the past twelve years remained largely consistent, recent increases have broadened the spread of funding to more distant locations as shown in Figure 9.6. In part, this reflects substantial new aid to Iraq and Afghanistan. Over the past decade, aid to the immediate region has increased by 48%, that to East Asia by 76%, South Asia 94%, Africa 134% and other spending 395%.

Table 9.2 lists Australia’s country-specific aid by value for 2009-10. An additional \$179 million is provided through non-specific cross-country funding plus regional funding for the Pacific (\$220 million), East Asia (\$141 million), and South Asia (\$10 million). Nonetheless, the country-specific data provides some indication of Australia’s aid priorities.

Table 9.2: Australian aid — spending by country 2009-10

Country	Australian Aid 2009-10\$ (million)	Country	Australian Aid 2009-10\$ (million)
Indonesia	396.2	Samoa	22
PNG	377.4	Burma	16.5
Solomon Islands	109.3	Nauru	15.4
Philippines	109.3	Tonga	14.9
Africa	103.5	Kiribati	13.2
Vietnam	91.0	Sri Lanka	11.3
East Timor	64.2	Nepal	10.8
Afghanistan	53.6	India	5.3
Pakistan	51.3	Tuvalu	5.0
Cambodia	47.9	Mongolia	3.3
Bangladesh	46.4	Micronesia	2.7
Vanuatu	41.6	Maldives	2.6
Iraq	39.4	Cook Islands	1.7
Laos	28.1	Niue & Tokelau	1.7
China	25.0	Samoa	22

Source: 2009-10 Ministerial Statement on Australia’s International Development Assistance Program

How does aid further Australia’s national interests?

Aside from making us feel better about ourselves, foreign aid furthers our national interests in two ways. First, bilateral aid to countries establishes a *quid pro quo* that facilitates access to and influence with foreign governments. Second, aid can bolster the institutions, infrastructure and human capital necessary for economic development and political stability. The rational for the first category is self-evident; the second furthers our national interest by improving the stability of countries important to our security.

Much of Australian aid is entirely of the first sort. The \$25 million we give to China each year, for example, makes no significant impact on its 1.3 billion people or its economic development. Other aid, like that to Solomon Islands, is directly focused on achieving tangible improvements in governance, human security and economic development.

An informative picture emerges by taking the ratio of Australian aid to a recipient country's GDP. High ratios indicate a real effort to make a difference in a country; small ratios reflect largely diplomatic gestures that will hopefully be repaid through access and influence. Table 9.3 lists Australian aid recipients in descending order of the ratio of Australian aid to national GDP. Not surprisingly, Solomon Islands heads the list followed by other countries from the immediate region. Note, some smaller Pacific countries have been omitted because economic data was not available. For comparison, the latest GDP per-capita in US dollars has been included as a measure of the relative level of poverty in recipient countries. Clearly, Australian aid is only loosely directed on the basis of need.

Table 9.3: Australian aid as a share of GDP 2008-09

Country	Ratio of Australian aid to GDP	2008 per-capita (US\$)	2008-09 Australian Aid (A\$m)	Country	Ratio of Australian aid to GDP	2008 per-capita (US\$)	2008-09 Australian Aid (A\$m)
Solomon Is.	19.4%	2,049	105.5	Maldives	0.17%	5,011	2.6
Kiribati	14.1%	3,707	11.6	Bhutan	0.13%	5,240	2
East Timor	10.3%	2,560	58.3	Vietnam	0.07%	2,774	77
Vanuatu	5.7%	4,202	37.4	Indonesia	0.07%	3,990	413.6
Micronesia	5.5%	2,183	15.2	Mongolia	0.05%	3,537	3
PNG	4.8%	2,085	359.8	Philippines	0.05%	3,539	97.3
Nauru	4.8%	4,522	2.5	Burma	0.04%	1,036	6.9
Tonga	4.4%	5,375	13.2	Nepal	0.04%	1,143	5.7
Samoa	3.1%	5,735	19.6	Bangladesh	0.04%	1,408	34.5
Cook Islands	1.1%	16,884	2.7	Iraq	0.03%	3,198	39.4
Fiji	0.5%	4,443	21	Sri Lanka	0.02%	4,589	10.9
Cambodia	0.3%	1,955	37.2	Pakistan	0.01%	2,757	26.8
Laos	0.3%	2,216	17.3	China	0.0005%	5,943	25
Afghanistan	0.3%	783	41.6	India	0.0002%	2,787	2.2

Sources: 2008-09 Ministerial Statement on Australia's International Development Assistance Program, IMF World Outlook 2008, Department of Foreign Affairs and Trade (DFAT) Country Profiles

The level of aid-to-GDP at which aid becomes an entirely diplomatic gesture is impossible to define, though it is hard to argue that figures below 0.5% of GDP reflect a serious effort to have a significant impact—except perhaps in a limited area like governance.

Conversely, it is clear that Australia is trying to make a real difference in those countries where aid approaches or exceeds 5% of GDP. As Table 9.3 shows, this category is entirely within our immediate region of the South West Pacific and East Timor. Unfortunately, as Table 9.4 overleaf shows, our efforts at generating sustainable development have been less than spectacular in the last few decades. Recent events in several of the countries indicate that our attempts to achieve political and civil stability have been little better.

As Australia's aid program ramps up steeply over the next several years, the government will face a question. How much should they increase Australian aid to far-flung countries in Africa and elsewhere, and how much should they focus efforts on getting our own immediate region in order.

From a purely strategic perspective the answer is simple; fix the immediate region as soon as possible. Many countries on our periphery have poor economic prospects and rapidly growing populations. Unless we mount a larger effort (of which aid can only be a part) to build stability and nurture development in places like Solomon Islands, East Timor and Papua New Guinea, problems like those of recent years are likely to become more frequent and severe.

Table 9.4: Australian aid as a share of GDP 2008-09 and economic growth

Country	Ratio of Australian aid to GDP	2008 per-capita (US\$)	Australian Aid 2008-09 (\$m)	Average annual GDP growth		
				1980-90	1990-00	2000-10
Solomon Islands	19.3%	2,049	105.5	-2.1%	-0.2%	1.0%
Kiribati	14.1%	3,707	11.6	~	~	~
East Timor	10.3%	2,560	58.3	~	~	-0.6%
Vanuatu	5.7%	4,202	37.4	0.6%	0.2%	0.8%
Micronesia	5.5%	2,183	15.2	~	~	~
PNG	4.8%	2,085	359.8	-1.0%	1.4%	0.7%
Nauru	4.8%	4,522	2.5	~	~	~
Tonga	4.4%	5,375	13.2	8.5%	1.2%	1.5%
Samoa	3.1%	5,735	19.6	0.1%	2.6%	3.2%
Cook Islands	1.1%	16,884	2.7	~	~	~
Fiji	0.5%	4,443	21	1.4%	3.8%	1.1%

Sources: 2008-09 Ministerial Statement on Australia's International Development Assistance Program, IMF World Outlook 2008, DFAT Country Profiles

Australia's military cooperation program

Allied to Australia's international aid effort, is the ~\$85 million a year Defence Cooperation Program run by the Department of Defence. According to the 2008-09 PBS, the Defence Cooperation Program supports the government's strategic objectives by:

- contributing to regional security
- working with allies, regional partners and others to shape the global and regional environment in a way favourable to Australia and the ADF
- consolidating acceptance of Australia as an obvious and legitimate participant in deliberations on issues that affect regional security
- encouraging and assisting with the development of defence self-reliance of regional countries.

In practice, the Defence Cooperation Program provides assistance to regional security forces through military advisors, training initiatives, bilateral exercises, capacity building, and equipment and infrastructure projects. A long-standing part of the

Defence Cooperation Program is the Pacific Patrol Boat Program that provided 22 Patrol Boats along with training and technical support to 12 Pacific Island countries. These vessels allow the countries involved in the Program to independently police their maritime territories.

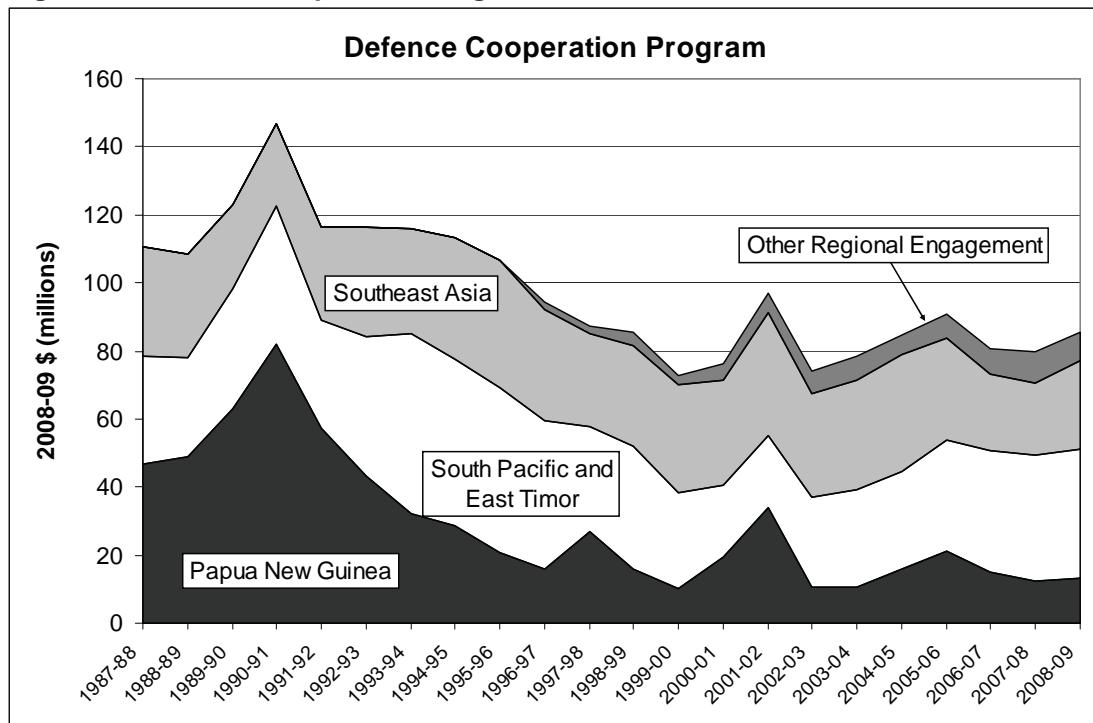
Figure 9.7 sets out the spending on the Defence Cooperation Program over the past twenty-odd years. For ease of display, individual country spending has been aggregated into convenient categories. Country specific data for the two most recent years available appears in Table 9.5. Unfortunately, the Defence Cooperation Program was not ready for inclusion in this year's PBS but will be tabled at Senate Estimates.

Table 9.5: Defence Cooperation Program—2007-08 to 2009-10

Country	2007-08 (\$m)	2008-09 (\$m)	Country	2007-08 (\$m)	2008-09 (\$m)
South Pacific			Southeast Asia		
Timor-Leste	8.500	8.197	Singapore	0.121	0.150
Vanuatu	1.400	1.366	Philippines	5.792	10.140
Solomon Islands	1.900	1.689	Thailand	3.068	2.922
Tonga	2.200	2.047	Malaysia	4.547	4.466
Western Samoa	0.500	0.462	Indonesia	5.009	5.105
Cook Islands	0.450	0.373	Vietnam	2.128	1.928
Fiji	0.504	0.192	Cambodia and Laos	0.764	1.187
Marshall Islands	0.850	0.775	Brunei	0.093	0.063
Micronesia	0.897	0.897	Sub-total	21.522	25.961
Tuvalu	1.400	1.186	Other regional activities	9.454	8.453
Kiribati	0.765	0.765	Total	73.948	85.518
Palau	0.808	0.858			
Multilateral Assistance	13.025	18.940			
Sub-total	33.199	37.747			
Papua New Guinea	9.773	13.357			

Source: Defence Budget Papers

Figure 9.7: Defence Cooperation Program—1987 to 2009



Source: Defence Budget Papers

ABOUT THE AUSTRALIAN STRATEGIC POLICY INSTITUTE

The Australian Strategic Policy Institute (ASPI) is an independent, non-partisan policy institute. It has been set up by the government to provide fresh ideas on Australia's defence and strategic policy choices. ASPI is charged with the task of informing the public on strategic and defence issues, generating new ideas for government, and fostering strategic expertise in Australia. It aims to help Australians understand the critical strategic choices which our country will face over the coming years, and will help government make better-informed decisions.

For more information, visit ASPI's web site at www.aspi.org.au.

ASPI's Research Program

Each year ASPI will publish a number of policy reports on key issues facing Australian strategic and defence decision makers. These reports will draw on work by external contributors.

Strategy: ASPI will publish up to 10 longer studies on issues of critical importance to Australia and our region.

Strategic Insights: A series of shorter studies on topical subjects that arise in public debate.

Special Reports: Generally written by ASPI experts, SPECIAL REPORTS are intended to deepen understanding on critical questions facing key strategic decision-makers and, where appropriate, provide policy recommendations. In some instances, material of a more technical nature may appear in this series, where it adds to the understanding of the issue at hand.

Specialist Publications: ASPI also produces valuable reference tools, such as The Cost of Defence and the Australian Defence Almanac.

Strategic Policy Forums: These are online roundtable discussions undertaken when a subject of critical importance requires debate. They bring together a range of experts to discuss the main policy alternatives, the results of which provide policy makers and the broader public with accurate and authoritative information about crucial strategic policy choices.

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ASPI's Programs

There are four ASPI programs. They will produce publications and hold events including lectures, conferences and seminars around Australia, as well as dialogues on strategic issues with key regional countries. The programs are as follows.

Strategy and International Program: This program covers ASPI's work on Australia's international security environment, the development of our higher strategic policy, our approach to new security challenges, and the management of our international defence relationships.

Operations and Capability Program: This program covers ASPI's work on the operational needs of the Australian Defence Force, the development of our defence capabilities, and the impact of new technology on our armed forces.

Budget and Management Program: This program covers the full range of questions concerning the delivery of capability, from financial issues and personnel management to acquisition and contracting out—issues that are central to the government's policy responsibilities.

Outreach Program: One of the most important roles for ASPI is to involve the broader community in the debate of defence and security issues. The thrust of the activities will be to provide access to the issues and facts through a range of activities and publications.

GLOSSARY

ADF	Australian Defence Force
AES	Additional Estimates Statements
AEW&C	Airborne Early Warning & Control
ANAO	Australian National Audit Office
APS	Australian Public Service
CDF	Chief of the Defence Force
CIOG	Chief Information Officer Group
CSP	Commercial Support Program
CUC	Capital Use Charge
DAR	Defence Annual Report
DCP	Defence Capability Plan
DFRB	Defence Force Retirement and Death Benefits
DHA	Defence Housing Authority
DMO	Defence Materiel Organisation
DRP	Defence Reform Program
DSG	Defence Support Group
DSTO	Defence Science and Technology Organisation
EWSP	Electronic Warfare Self Protection
FADT	Foreign Affairs Defence and Trade
FBT	Fringe Benefits Tax
FMA	<i>Financial Management and Accountability Act 1997</i>
GDP	Gross Domestic Product
GST	Goods and services tax
OPA	Official Public Account
PAES	Portfolio Additional Estimates Statements
PBS	Portfolio Budget Statement
SES	Senior Executive Service

Notes

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