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Economic Contribution of the Naval Bases in Sydney

31 January 2011

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Contents

Glossary of Terms

Computable General Equilibrium (CGE) model - A CGE model combines economic data with economic theory to generate a model of an economy. This model can then be used to estimate how an economy may adjust to external shocks such as a policy change.

Consumption – Total expenditure on goods and services that are privately consumed by households.

Direct impacts - Direct impacts on employment, industry value added and industry turnover are the result of the naval bases operating within Sydney. For example, the direct contribution of the facilities to employment in Sydney includes staff who are employed to work at the facilities, e.g. Australian Defence Force (ADF), Australian Public Servant (APS) and contractor personnel.

Indirect impacts - Indirect or flow-on impacts are the result of two factors. The first is the impact of consumer spending in Sydney/New South Wales by people who are employed directly by the naval bases. The second is the impact of additional spending by upstream businesses that supply goods and services to the facilities.

Living Standards – KPMG Econtech uses consumption as the measure of living standards rather than value added. As living standards derive from consumption, not value added, consumption (in principle) is a more appropriate measure of changes in living standards.

Murphy Model Regional (MMR) - A CGE model that estimates the effects of policies that are state or region specific. The model divides Australia into 33 regions and 8 states and territories, and incorporates 18 industries which correspond to the Australian and New Zealand Standard Industrial Classification (ANZSIC) used by the Australian Bureau of Statistics (ABS).

Non-Traded Goods - Goods and services that cannot be sold in the larger state or national market. These goods are only sold in the local market and therefore prices are determined in the local market.

Shock – Describes the change that is made to the model to estimate how an economy may adjust. For example, the shock simulates the impact of the policy change to the economy.

Traded Goods - Goods and services that can be sold in the larger state or national market. The prices of these goods and services are determined in the larger market.

Turnover - The total value of goods and services provided by the business. This will be equal to the goods and services that the business purchases as intermediate inputs, plus wages and salaries, plus profit.

Value Added - The total value of goods and services provided by the business, less the goods and services that the business purchases as intermediate inputs. Thus value added is equivalent to wages and salaries plus profit.

Abbreviations

ABS – Australian Bureau of Statistics

ADF – Australian Defence Force

ANZSIC - Australian and New Zealand Standard Industrial Classification

APS – Australian Public Servant

CGE – Computable General Equilibrium

FTE – Full Time Equivalent

GIDP – Garden Island Defence Precinct

GSP – Gross State Product

HMAS – Her Majesty's Australian Ship

MMR – Murphy Model Regional

RAN – Royal Australian Navy

Executive Summary

Introduction and purpose

The purpose of this report is to identify for the Department of Defence (Defence) the economic contribution of the four naval bases in Sydney to the regional and state economy.

In this study KPMG Econtech has estimated the economic impact of each facility on the Sydney regional economy, and the economic impact of all four naval bases on the New South Wales state economy, using a consistent and robust methodology. The results in this report are expressed[1] in 2009/10 dollars based on reported activity in 2008/09.

Naval Bases

The specific naval bases analysed in this report are: Garden Island Defence Precinct (GIDP) and HMA Ships *Waterhen*, *Watson* and *Penguin*.

Garden Island Defence Precinct (GIDP) is the main naval base on the east coast of Australia. Its facilities occupy 51 hectares in Potts Point, with an indicative estimate of approximately 4,300 personnel[2] on the base at any one time.

HMAS *Waterhen* is located on Sydney's Lower North Shore, occupying a 3.3 hectare leasehold site with an additional 0.8 hectares of Defence-owned land. *Waterhen* has approximately 800 personnel.

HMAS *Watson* is located at Sydney's South Head, occupying a 20 hectare site. *Watson* has approximately 250-300 personnel and approximately 300 additional trainees on course at any one time.

HMAS *Penguin* is located on Sydney's Middle Harbour, occupying a 17.6 hectare site. *Penguin* has approximately 670 personnel, with a further 335 Army personnel.

Modelling Methodology

The economic impacts of each naval base on the Sydney regional economy and all four bases on the New South Wales state economy are estimated by identifying the direct economic impacts and estimating the indirect economic impacts.

- *Direct impacts* on employment, industry value added and industry turnover are the result of the naval base operating within the Sydney regional economy. For example, the direct contribution to employment in the Sydney regional economy include staff who are employed to work at the bases, i.e. Australian Defence Force (ADF), Australian Public Servant (APS) and contractor personnel. The direct contribution of the bases to turnover is the sum of payments made by the naval bases and contractors to wages and salaries, expenditure on intermediate goods and any profits made by Defence contractors based in New South Wales. The direct impact also includes visitor expenditure as the GIDP supports economic activity by hosting a large number of visitors each year from visiting Royal

[1] Results including expenditure categories outlined in Chapter 5 and 6 have been scaled from the 2008/09 financial year to 2009/10 financial year. Results are scaled for inflation only and as such are not scaled for growth.
[2] The employment numbers differ slightly from the direct employment impacts as they are from a specific point in time whereas the base employment numbers are an approximation over time.

Australian Navy (RAN) and international vessels. These visitors purchase local goods and services.

- *Indirect impacts* are the result of two factors. The first is the impact of consumer spending in the Sydney region by people who are employed directly by the Defence facilities. The second is the impact of additional spending by upstream businesses that supply goods and services to the facilities.

The direct impacts of the naval bases can be estimated in a relatively straightforward manner using available data on Defence expenditure, employment numbers and information on ship visits. Measuring the indirect impacts requires the use of economic modelling. Hence, the full economic impacts of the Defence facilities are modelled using KPMG Econtech's Murphy Model Regional (MMR) model.

MMR is a Computable General Equilibrium (CGE) model. A CGE model combines economic data with economic theory to generate a model of an economy. This model can then be used to estimate how an economy may adjust to external shocks such as a policy change. KPMG Econtech's MMR model estimates the effects of policies that are state or region specific. The model divides Australia into 33 regions and 8 states and territories, and incorporates 18 industries which correspond to the Australian and New Zealand Standard Industrial Classification (ANZSIC) used by the Australian Bureau of Statistics (ABS).

Modelling Inputs

Estimates of the direct employment and expenditure impacts were used as the main modelling inputs into MMR. Estimates of the direct impact of each facility are based on activity during 2008 and 2009. The direct impacts for each facility are presented in Table 1 below. Further information on the modelling inputs is provided in Section 4.4.

Table 1 Modelling Inputs

Facility	Number of FTE's (jobs)	Expenditure ($m)
Garden Island Defence Precinct	4,180.5	11.8
HMAS *Waterhen*	690.0	-
HMAS *Watson*	438.8	-
HMAS *Penguin*	378.0	-
New South Wales	**5,687.3**	**11.8**

Source: KPMG Econtech estimates based on information provided by the Department of Defence

Economic Impacts

The key results of the economic modelling at both the regional and state level are presented in Table 2 and Table 3 respectively. It is important to note that these are estimates of the direct and indirect impacts; the New South Wales total is not simply the sum of the regional results. Analysis at the state level captures flow-on impacts to other regions within the state, thus the New South Wales total reflects the impact on all regions whereas the individual results reveal only the impact on the Sydney regional economy.

Economic impact of naval bases on the Sydney regional economy

Economic impact modelling was carried out on the Sydney regional economy for four naval bases: GIDP, *Waterhen*, *Watson* and *Penguin*. The following estimates of employment, value added and consumption impacts represent the average annual economic contribution of the facilities. The results in this report are expressed[3] in 2009/10 dollars based on reported activity in 2008/09.

Table 2 Economic Impacts Summary

Defence Facility	Employment (jobs)	Value Added ($m)	Turnover ($m)	Consumption ($m)
Regional Impacts				
Sydney Region				
Garden Island	6,784	473.3	812.3	527.6
HMAS *Waterhen*	986	67.9	115.4	76.4
HMAS *Watson*	627	43.2	73.3	48.7
HMAS *Penguin*	540	37.2	63.1	41.9

Chart A: Employment Impacts (Jobs)

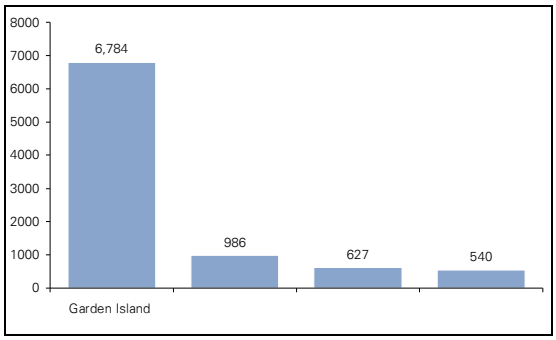


Chart B: Consumption Impacts ($m)

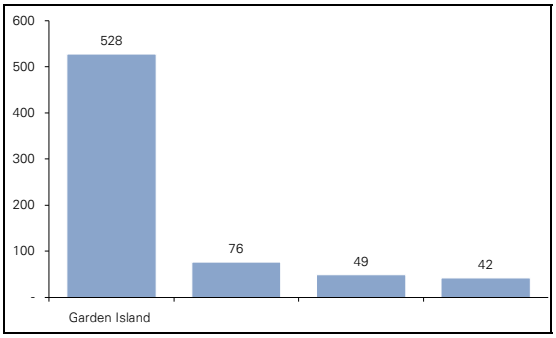


Chart A shows the direct and indirect employment impacts of each base on the Sydney region. Chart B shows the consumption impacts of each base on the region. The results demonstrate the average annual impact of the facility on the Sydney region compared to a hypothetical scenario where the base no longer operates in the same region. For example, the modelling estimates that GIDP supports 6,784 jobs directly and indirectly in the Sydney regional economy, and contributes $528 million (2009/10 dollars) each year to consumption in the Sydney region.

The results show that a substantial proportion of the overall employment impact occurs in the Government Administration and Defence Industry, as each of the bases directly employs a large number of ADF, APS and contractor staff within that sector. These direct employment impacts produce positive indirect employment impacts in industries that supply goods and services to the naval bases and sell consumer goods to the personnel. As such, consumer based industries including Retail Trade, Finance and Insurance, Education, and Health and Community Services are supported by the spending of Defence employees.

At the same time, expenditure by each naval base on goods and services within the regional economy contributes to price pressures within some industries. As such, some employment impacts occur in industries that experience reduced competitiveness through higher input prices. This is estimated to affect industries such as Manufacturing, Construction, Transport and

[3] Results including expenditure categories outlined in Chapter 5 and 6 have been scaled from the 2008/09 financial year to 2009/10 financial year.

Storage, and Property and Business Services. However, the overall impact of each naval base on employment in the Sydney regional economy is positive. These findings are consistent with the findings of previous modelling undertaken by KPMG Econtech[4].

Key Economic Impacts for New South Wales

The same four Defence facilities were analysed at the state level; other naval bases in New South Wales were not included in the analysis. The estimates of employment, value added and consumption impacts in Table 3 represent the average annual economic impacts attributable to the bases. The results in this report are expressed[5] in 2009/10 dollars based on reported activity in 2008/09. It is important to note that the New South Wales total is not simply the sum of the regional results. Analysis at the state level captures flow-on impacts to other regions within the state, thus the New South Wales total reflects the impact on all regions.

Table 3 Economic Impacts Summary - NSW impacts

	Employment (jobs)	Value Added ($m)	Turnover ($m)	Consumption ($m)
NSW Impacts	8,684	607.6	1,054.4	613.4

The modelling estimates that the naval bases support 8,684 jobs directly and indirectly in the New South Wales economy. The overall impact on Gross State Product (GSP) (value added) is positive, with the bases contribute $608 million (2009/10 prices) each year to the state's value added. The bases contribute to living standards in New South Wales by supporting production and employment, with an estimated contribution of $613 million (2009/10 prices) to consumption each year in New South Wales.

[4] *Economic contribution of major Defence facilities in the Northern Territory* and *Economic contribution of the RAAF Base, Richmond, to the Sydney economy* by KPMG Econtech.
[5] Results including expenditure categories outlined in Chapter 5 and 6 have been scaled from the 2008/09 financial year to 2009/10 financial year.

1 Introduction

The purpose of this report is to identify for the Department of Defence (Defence) the economic contribution of the four naval bases in Sydney to the regional and state economy.

In this study KPMG Econtech has estimated the economic impact of each facility on the Sydney regional economy, and the economic impact of all four naval bases on the New South Wales state economy, using a consistent and robust methodology. While Defence makes a significant contribution to the Sydney and New South Wales economy, there is scope to understand the nature and extent of this contribution in greater detail.

Broadly, the analysis seeks to:

- describe the economic profile of the four naval bases in Sydney - Garden Island Defence Precinct (GIDP) and HMA Ships *Waterhen*, *Watson* and *Penguin*;
- identify the value (direct and indirect) of the bases' presence and operations to the Sydney regional economy and New South Wales state economy;
- summarise the overall direct and indirect contribution of the bases; and
- summarise the value added component of the bases' combined output to the New South Wales state economy.

1.1 Report Structure

The report is structured as follows:

- Section 2 provides an overview of GIDP, *Waterhen*, *Watson* and *Penguin* facilities, describing the history, location, principal functions and workforce estimate for each facility.
- Section 3 provides an overview of the Sydney regional economy. This includes data on the industry composition, population profile, social and economic indicators, and housing and income statistics.
- Section 4 outlines the modelling approach used to estimate the economic contribution of the naval bases and contains estimates of the direct economic impacts of the facilities.
- Section 5 presents the estimated contribution of the naval bases to the Sydney regional economy.
- Section 6 presents the estimated contribution of the individual facilities to the New South Wales state economy.
- Section 7 provides a brief conclusion of the analysis and results.

2 Overview of Naval Bases in the Sydney Region

This section provides an overview of the four naval bases in Sydney. The information in this section has been provided by Defence.

2.1 Garden Island Defence Precinct (GIDP)

Garden Island Defence Precinct (GIDP) is the main naval base on the east coast of Australia, encompassing a range of key facilities. These facilities occupy 51 hectares on Cowper Wharf Road, Wylde Street and Macleay Street in Potts Point (approximately 2 kilometres from the central business district). Garden Island provided support to Royal Navy ships from the 1850s, prior to the establishment of the Royal Australian Navy (RAN) in 1911. During World War II, the construction of the Captain Cook Dock (the largest graving dock in the southern hemisphere) and a land bridge permanently joined the island to the mainland. The north-eastern tip of Garden Island, housing the RAN Heritage Centre, was made a public access area in 2002.

Figure 2.1 Garden Island Defence Precinct

Source: Department of Defence

GIDP comprises almost 150 major and minor buildings including the Fleet Base East facilities and berths, the Captain Cook Dock, HMAS Kuttabul and Fleet Headquarters. GIDP has an enduring strategic role in the defence of Australia and the ability of Australia's maritime forces to conduct operations in the region and further abroad.

Today, GIDP provides operational, logistic and administrative support for 11 home-ported warships as well as berthing for other visiting Royal Australian Navy (RAN) and international ships. The logistic and maintenance support entails a sizeable contractor workforce in addition to the Thales Australia presence under a lease of the dockyard and associated buildings until 2013. A comprehensive range of other operational, logistic, administrative and training functions are performed throughout the precinct, providing support to the Fleet and the broader Navy and Defence presence in Sydney.

There is a highly variable number of personnel in GIDP at any one time, dependent on the number of home-ported and visiting warships alongside, the number of contractors and Thales Australia personnel on site, and the number of visitors to the public access area. The indicative

estimate is approximately 4,300 military, civilian and contractor personnel on average, including the crews of vessels and visitors to the precinct.

2.2 HMAS *WATERHEN*

HMAS *Waterhen* is located on Sydney's Lower North Shore, occupying a 3.3 hectare leasehold site with an additional 0.8 hectares of Defence-owned land, off Balls Head Road, Waverton (approximately 5 kilometres from the central business district). *Waterhen* was commissioned as the support base for the Ton class mine sweepers on 5 December 1962, located on the site of the quarrying required for the Captain Cook Dock and Garden Island land bridge. The base was redeveloped in its entirety through a $70 million modernisation program in the mid-1990s.

Figure 2.2 HMAS *Waterhen*

Source: Department of Defence

Today, *Waterhen* is the RAN's lead establishment and training facility for the Mine Warfare and Clearance Diving Group. The base provides berthing for the RAN's six Huon class Mine Hunter Coastal vessels and other support craft, operational and logistic support, administrative support and training infrastructure. The Mine Warfare Faculty and Mine Warfare Systems Centre are located at Waterhen, as well as Australian Clearance Diving Team One and a detachment of Fleet Support Unit - Sydney.

Waterhen has approximately 800 military, civilian and contractor personnel, including lodger units and the crews of the Mine Hunter Coastal vessels.

2.3 HMAS *WATSON*

HMAS *Watson* is located at Sydney's South Head, occupying a 20 hectare site off Cliff Street, Watsons Bay (approximately 11 kilometres from the central business district). *Watson* was commissioned as the RAN's Radar Training School on 14 March 1945, and there was an Army presence on the base until 1981. The base has significant historical content protected by National Trust and the land is surrounded by the Sydney Harbour National Park.

Figure 2.3 HMAS *Watson*

Source: Department of Defence

Today, *Watson* is the home of the Training Authority - Maritime Warfare, the premier maritime warfare training establishment preparing personnel to perform warfighting roles at sea. A range of basic and advanced training is provided for Junior and Senior Sailors, Principal Warfare Officers, Force Warfare Officers and for the newly appointed Commanding Officers/Executive Officers of ships and shore establishments. This includes navigation training and command team training, for example.

Watson has approximately 250-300 military, civilian and contractor personnel, and approximately 300 additional trainees on course at any one time. No ships are home-ported at *Watson.*

2.4 HMAS *PENGUIN*

HMAS *Penguin* is located on Sydney's Middle Harbour, occupying a 17.6 hectare site on Middle Head Road, Mosman (approximately 10 kilometres from the central business district). *Penguin* was originally commissioned as *Penguin* II on 14 July 1942 and was renamed simply *Penguin* in 1943. Former Defence land surrounding the base is now managed by the Sydney Harbour Federation Trust, with the Sydney Harbour National Park to the east/southeast and the Balmoral Reserve to the west.

Figure 2.4 HMAS *Penguin*

Source: Department of Defence

Today, *Penguin* supports key training and health support functions. *Penguin* is the home of the RAN Diving School, RAN Hydrographic School and Medical Training School, with the resident Submarine and Underwater Medicine Unit and RAN Recompression Chamber Facility reinforcing *Penguin's* claim as a centre of underwater medicine expertise. While Balmoral Naval Hospital at *Penguin* is no longer the primary naval medical facility (this role is performed by the leased Navy Ward at St Vincents Hospital), an area of the Hospital has been allocated for the planned ADF Centre for Mental Health, which will provide mental health treatment programs and training for the Navy, Army and Air Force. The Army's 1 Commando Company and Headquarters 1 Commando Regiment relocated to *Penguin* in 2003.

Penguin has approximately 670 military, civilian and contractor personnel, with a further 335 largely Army Reserve personnel in 1 Commando Company and Headquarters 1 Commando Regiment. No ships are home-ported at *Penguin*.

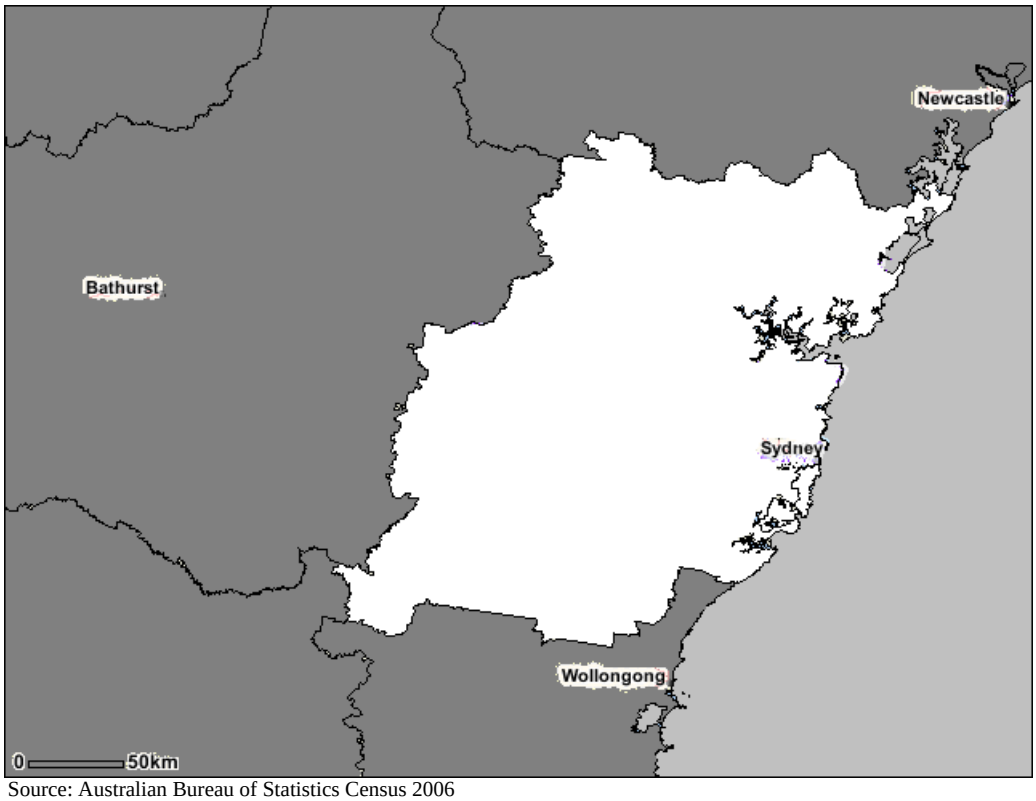
3 Overview of the Local Economy

This section provides an overview of the Sydney region in which the naval bases are located.

3.1 Sydney Region

The Sydney Region profile provides contextual understanding about the region as a whole. The Australian Bureau of Statistics (ABS) Census 2006 provides the most current and detailed data for the Sydney Region. The statistical region is the Sydney statistical subdivision.

Chart 3.1: Sydney Region



Source: Australian Bureau of Statistics Census 2006

Demographic Profile

The estimated resident population of the Sydney Region in 2006 was approximately 4.1 million. The Sydney region experienced strong population growth of 3.1 per cent between 1996 and 2001, far exceeding the state and national growth rates over the same period. Over the 10 years to 2006, population growth in the Sydney region of 1.0 per cent was in line with population growth in New South Wales (0.9 per cent) and Australia (1.1 per cent).

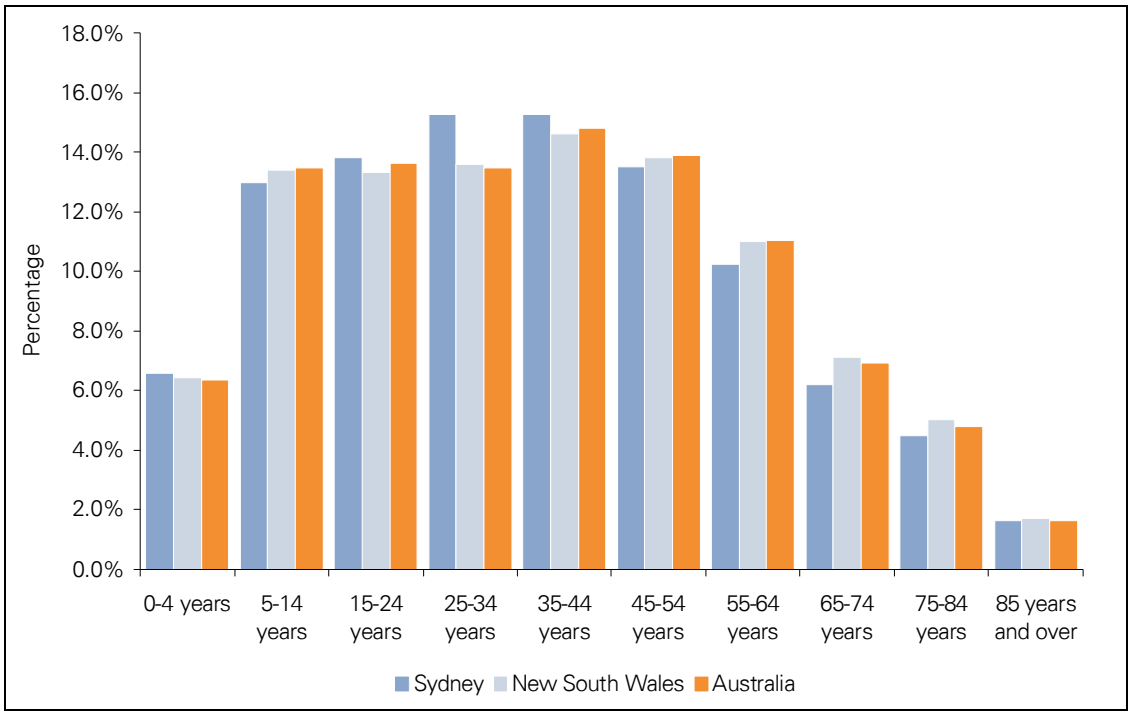
Table 3.1 Rates of Population Growth - 1996 - 2006

	Population					CAGR
	1996	2001	2006	1996-2001	2001-2006	1996-2006
Sydney Region	3,717,417	4,330,676	4,119,189	*3.1%*	*-1.0%*	*1.0%*
New South Wales	6,006,206	6,270,781	6,549,179	*0.9%*	*0.9%*	*0.9%*
Australia	**17,752,829**	**18,588,308**	**19,855,288**	***0.9%***	***1.3%***	***1.1%***

Source: ABS Census

Note: CAGR = Compounded annual growth rate

Chart 3.1: Age Profile - 2006



Source: Australian Bureau of Statistics Census 2006

The chart above compares the age profile of the Sydney Region population with the age profile in the broader state and national populations. The Sydney Region has a higher proportion of children and young adults than New South Wales and Australia, reflective of a younger population. The high proportion of younger population provides the Navy with a larger pool for recruitment opportunities.

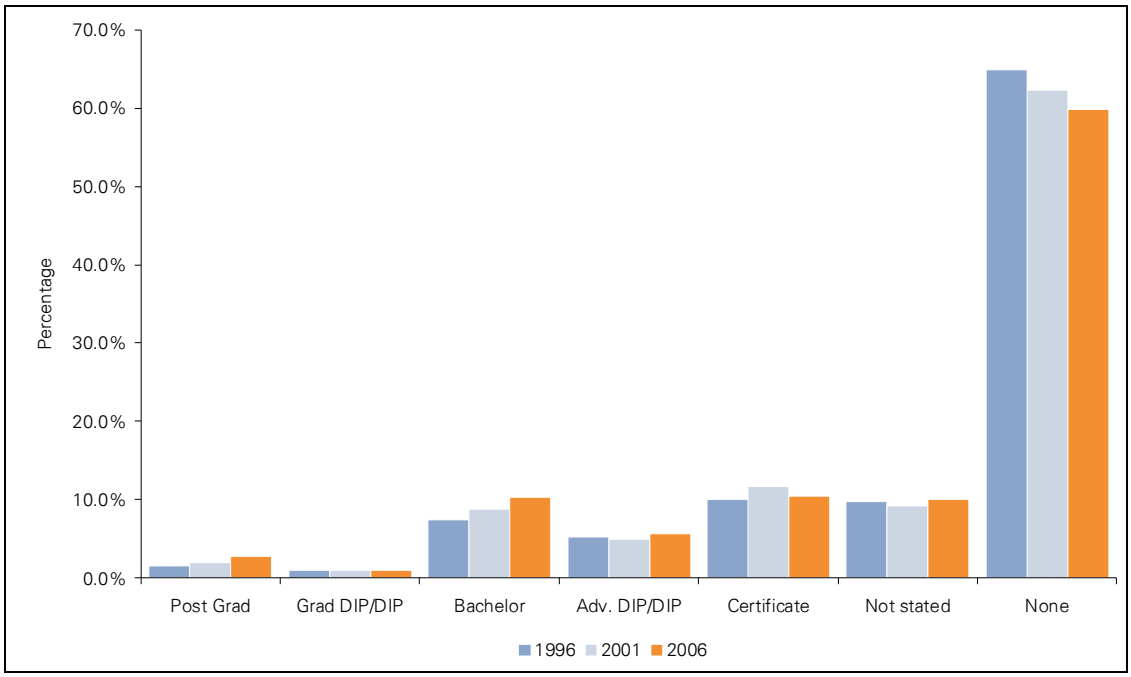
Education

In 2006, 14.9 per cent of the Sydney Region population 15 years and over held a non-school qualification, compared to 16.8 per cent in New South Wales more broadly. Of these, 26.0 per cent hold a Certificate, 25.5 per cent hold a Bachelor Degree and 14.1 per cent hold an Advanced Diploma or Diploma.

The most common field of study in the Sydney Region was Management and commerce (20.5 per cent), reflecting the fact that Sydney is Australia's financial centre. This field of study was followed by Engineering and related technologies (14.1 per cent), and Society and Culture (9.4 per cent).

Chart 4.2 shows the non-school educational attainment in the Sydney Region over the 10-year period from 1996-2006. The number of residents obtaining a non-school qualification has increased at an average annual rate of 2.2 per cent from 1996-2006 compared to 2.9 per cent in NSW. The number of residents that obtained non-school qualifications increased across all levels of education over the period.

Chart 3.2: Sydney Region Educational Attainment – 1996, 2001, 2006



Source: Australian Bureau of Statistics Census 2006

Employment and Occupation

The Sydney Region's labour force participation in 2006 was in line with the overall participation rate of Australia.

Table 3.2 Labour Force Participation - 2006

	Sydney Region		New South Wales		Australia	
	Number	% of total	Number	% of total	Number	% of total
Total labour force	2,010,007	*60.6%*	3,092,600	*58.9%*	9,607,984	*60.4%*
Not in the labour force	1,052,817	*31.8%*	1,801,012	*34.3%*	5,271,114	*33.1%*
Labour force not stated	251,335	*7.6%*	356,647	*6.8%*	1,038,978	*6.5%*
Total	**3,314,159**	***100.0%***	**5,250,259**	***100.0%***	**15,918,076**	***100.0%***

Source: ABS Census

The unemployment rate in the Sydney Region (5.3 per cent) was significantly lower than the broader New South Wales unemployment rate (5.9 per cent). However, it was in line with the national unemployment rate.

Table 3.3 Labour Force Participation - 2006

	Sydney Region		New South Wales		Australia	
	Number	% of total	Number	% of total	Number	% of total
Total Employed	1,903,527	*94.7%*	2,909,443	*94.1%*	9,104,175	*94.8%*
Total Unemployed	106,480	*5.3%*	183,157	*5.9%*	503,809	*5.2%*
Total	**2,010,007**		**3,092,600**		**9,607,984**	

Source: ABS Census

The most common employment occupation in the Sydney Region is Professionals, as is the case with New South Wales and Australia. Clerical workers and Managers were the next most common occupations in the region.

Table 3.4 Occupation Profile - 2006

	Sydney Region		New South Wales		Australia	
	Number	%	Number	%	Number	%
Managers	250,970	*13.2%*	396,460	*13.6%*	1,202,261	*13.2%*
Professionals	452,291	*23.8%*	616,276	*21.2%*	1,806,016	*19.8%*
Technicians	241,714	*12.7%*	396,721	*13.6%*	1,309,256	*14.4%*
Community	152,723	*8.0%*	249,578	*8.6%*	801,902	*8.8%*
Clerical	318,004	*16.7%*	447,951	*15.4%*	1,365,810	*15.0%*
Sales Workers	181,390	*9.5%*	282,290	*9.7%*	896,209	*9.8%*
Machinery	113,681	*6.0%*	187,135	*6.4%*	604,616	*6.6%*
Labourer	153,459	*8.1%*	277,549	*9.5%*	952,519	*10.5%*
Other	39,294	*2.1%*	55,480	*1.9%*	165,595	*1.8%*
Total	**1,903,526**	***100.0%***	**2,909,440**	***100.0%***	**9,104,184**	***100.0%***

Source: ABS Census

Industry Profile

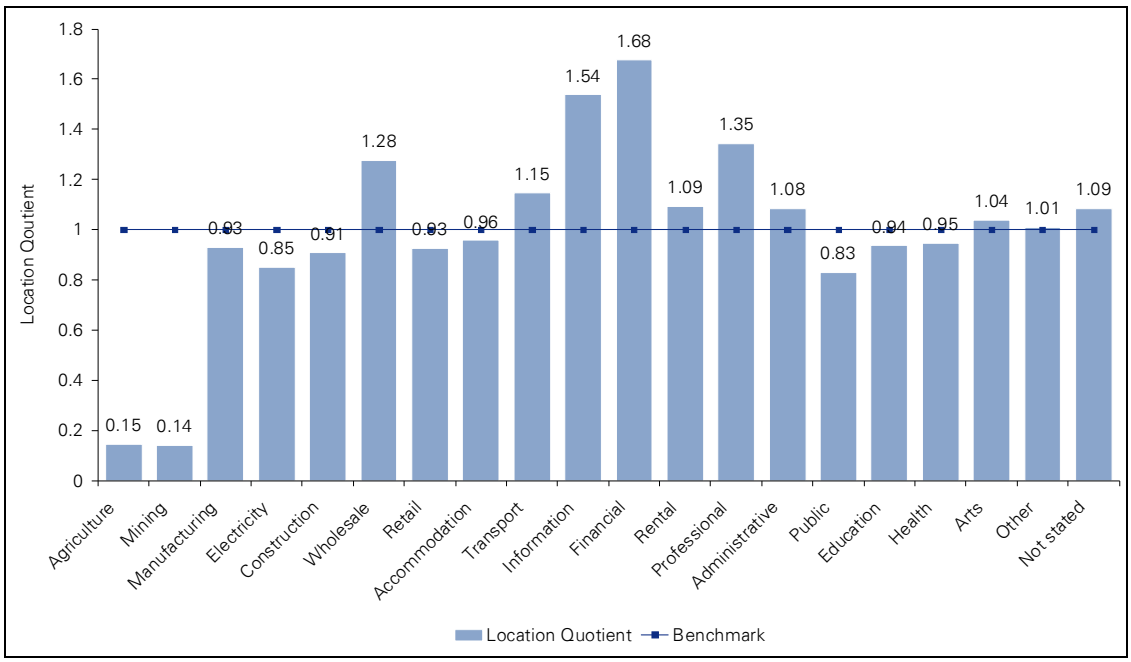
The chart below shows location quotients for the Sydney Region for each industry sector. Location quotients give an indication of which industry sectors are important for the region, and are based on regional employment by industry[6]. A location quotient greater than 1 indicates that an industry is relatively concentrated in the region, compared to Australia as a whole.

This analysis indicates that the Sydney Region has a high concentration of employment in Financial and Insurance services, compared to the national average. This result is unsurprising given that the Sydney region is the financial centre of Australia.

Other significant industries in the Sydney Region are: Information, Media and Telecommunications; Professional, Scientific and Technical services; Wholesale Trade; Transport and Storage; Rental, Hiring and Real Estate Services; Administrative and Support Services; and Arts and Recreation Services.

Defence is under-represented in Sydney when compared to other regions. For example, Defence has a significant presence in Adelaide (location quotient of 1.08) and the Darwin region (location quotient of 3.2).[7] However, the Defence facilities in Sydney remain an important part of the regional economy.

Chart 3.3: Sydney Region - Industry Profile 2006



Source: Australian Bureau of Statistics Census 2006

[6] Location Quotient = ((regional employment in industry$_{(i)}$ in year$_{(t)}$ / total regional employment in year$_{(t)}$) / (national employment in industry$_{(i)}$ in year$_{(t)}$) / (total national employment in year$_{(t)}$)).
[7] KPMG Econtech reports *Economic Report into the Major Defence Bases in the Northern Territory* and *Report on the Economic Impact of Major Defence Facilities in South Australia*.

Table 3.5 shows the percentage of persons employed in the Sydney Region in 1999, 2001 and 2006. In 2006, the industries that employed the largest number of people were Retail Trade, Health Care and Social Assistance, and Manufacturing. The table shows that over the 10-year period, total employment has grown at an average annual rate of 1.2 per cent.

Table 3.5 Employment by industry - Sydney Region

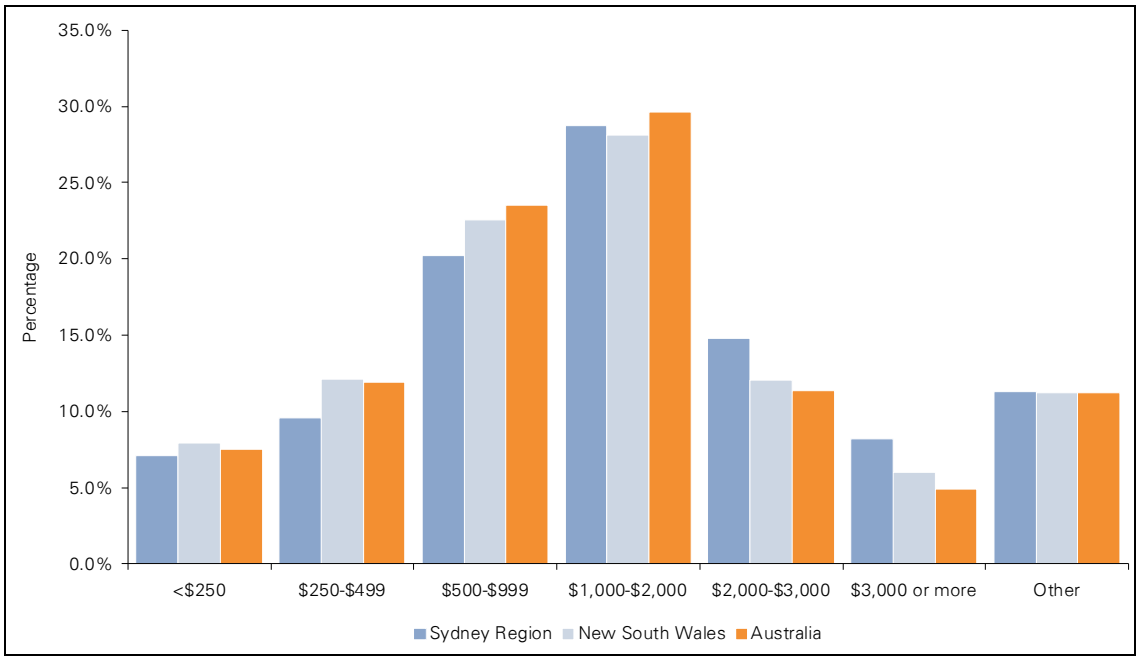
	1996		2001		2006		CAGR
	People	%	People	%	People	%	1996-2006
Agriculture, forestry & fishing	11,033	*0.7%*	13,135	*0.7%*	8,519	*0.4%*	*-2.6%*
Mining	3,509	*0.2%*	3,719	*0.2%*	3,172	*0.2%*	*-1.0%*
Manufacturing	201,416	*12.0%*	227,333	*11.5%*	184,978	*9.7%*	*-0.8%*
Electricity, gas, water & waste services	13,729	*0.8%*	16,603	*0.8%*	15,930	*0.8%*	*1.5%*
Construction	103,808	*6.2%*	133,276	*6.8%*	134,626	*7.1%*	*2.6%*
Wholesale trade	112,135	*6.7%*	111,233	*5.6%*	105,853	*5.6%*	*-0.6%*
Retail trade	161,722	*9.6%*	204,174	*10.4%*	200,278	*10.5%*	*2.2%*
Accommodation & food services	99,303	*5.9%*	122,374	*6.2%*	115,023	*6.0%*	*1.5%*
Transport, postal & warehousing	93,520	*5.6%*	103,537	*5.3%*	102,529	*5.4%*	*0.9%*
Information media & telecommunications	58,922	*3.5%*	71,745	*3.6%*	56,853	*3.0%*	*-0.4%*
Financial & insurance services	101,033	*6.0%*	116,324	*5.9%*	122,185	*6.4%*	*1.9%*
Rental, hiring & real estate services	28,361	*1.7%*	37,768	*1.9%*	35,128	*1.8%*	*2.2%*
Professional, scientific & technical services	137,302	*8.2%*	173,103	*8.8%*	169,351	*8.9%*	*2.1%*
Administrative & support services	55,122	*3.3%*	71,727	*3.6%*	64,903	*3.4%*	*1.6%*
Public administration & safety	89,490	*5.3%*	97,978	*5.0%*	105,688	*5.6%*	*1.7%*
Education & training	111,050	*6.6%*	135,466	*6.9%*	136,633	*7.2%*	*2.1%*
Health care & social assistance	151,008	*9.0%*	175,336	*8.9%*	189,218	*9.9%*	*2.3%*
Arts & recreation services	24,819	*1.5%*	27,637	*1.4%*	27,695	*1.5%*	*1.1%*
Other services	74,544	*4.4%*	80,700	*4.1%*	71,307	*3.7%*	*-0.4%*
Inadequately described/Not stated	52,381	*3.1%*	47,059	*2.4%*	53,657	*2.8%*	*0.2%*
Total	**1,684,207**	***100.0%***	**1,970,227**	***100.0%***	**1,903,526**	***100.0%***	***1.2%***

Source: ABS Census

Income Profile

The income of households living in the Sydney Region is an important indicator of their socio-economic status. The 2006 Census data indicates that the Sydney Region residents are relatively wealthy compared to New South Wales and Australia. The median weekly household income in the Sydney Region ($1,154) is higher than the state ($1,036) and national ($1,027) median. The income distribution shows that the largest proportion of employees in the Sydney Region is in the $1,000-$2,000 bracket, consistent with both the state and the nation. In addition, the Sydney region has a higher proportion of residents in the high income brackets, reflecting the higher cost of living in the Sydney Region.

Chart 3.4: Sydney Region - Income Profile 2006

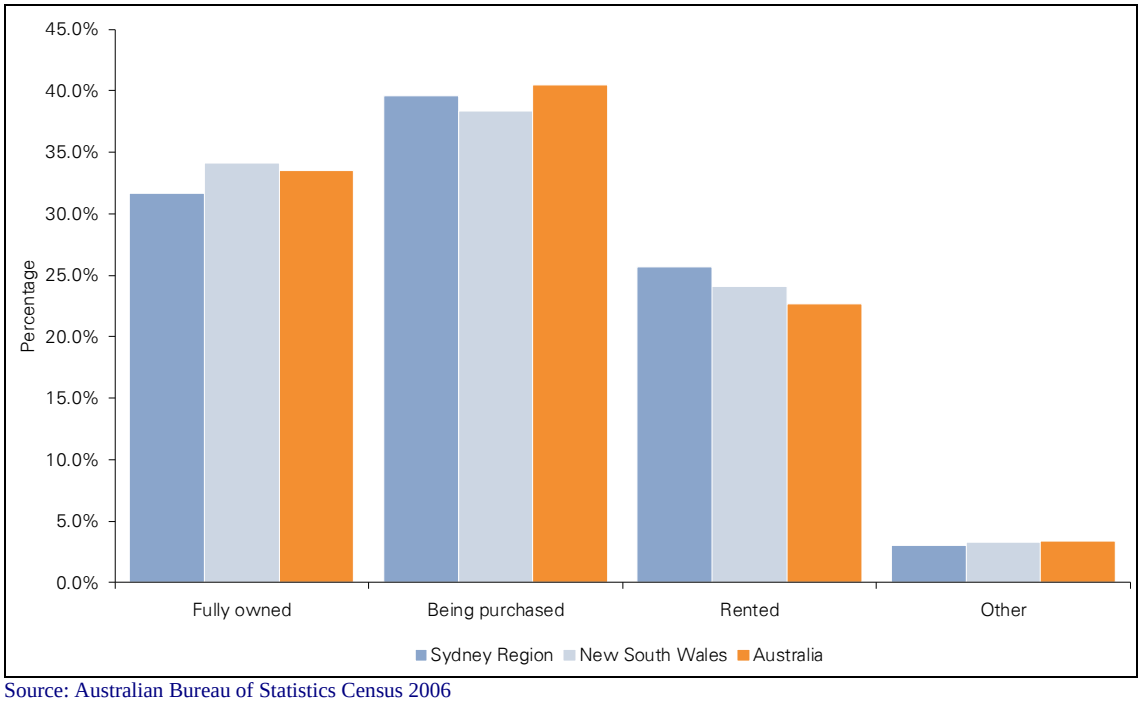


Source: Australian Bureau of Statistics Census 2006

Housing

The following chart shows the home ownership structure in the Sydney Region compared to New South Wales and Australia in 2006. In 2006, approximately 70 per cent of residents in the Sydney Region were purchasing a home or owned their own home. This reflects the younger demographic in the region. The median weekly rent in the Sydney Region ($250) was higher than the New South Wales median ($210), both figures well above the Australian median ($190).

Chart 3.5: Sydney Region – Household Tenure 2006



Source: Australian Bureau of Statistics Census 2006

4 Modelling Approach

This section outlines the modelling approach used to estimate the economic impacts of the four naval bases in Sydney. The methodology used is consistent with previous studies of the economic contribution of Defence facilities in the Northern Territory and of RAAF Base Richmond to the Northern Sydney regional economy.

- Section 4.1 outlines the methodology used to estimate the economic impacts of the naval bases on the New South Wales economy, including assumptions and limitations.
- Section 4.2 describes the scenarios that are used to estimate the economic impacts.
- Section 4.3 details the main data inputs that are used to model the alternative scenarios.

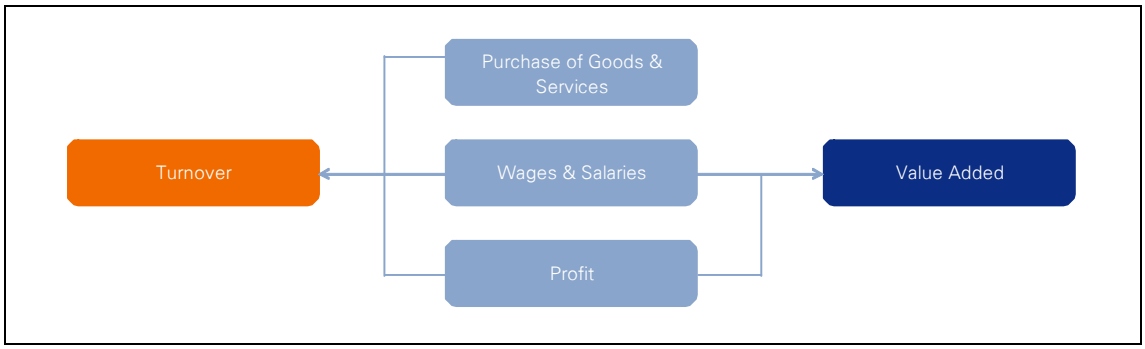
4.1 Methodology

The impacts of the naval bases on the Sydney regional economy and New South Wales state economy can be assessed using a number of different economic metrics:

- employment;
- value added (or gross domestic product);
- turnover (or revenue or sales); and
- living standards.

Chart 4.1 demonstrates how these measures relate to one another.

Chart 4.1 Value Added vs. Turnover



- The turnover/revenue of a business refers to the total value of services provided by the business. This is equal to the goods and services that the business purchases as intermediate inputs, plus wages and salaries, plus profit. In contrast, the value added of a business refers to the total value of services provided by the business, less the goods and services that the business purchases as intermediate inputs. Thus value added is equivalent to wages and salaries plus profit.

Value added is often used as a measure to estimate the impact on living standards, but it is a measure of output rather than a measure of well-being. As living standards derive from consumption, rather than value added, consumption is a more appropriate measure of changes in

living standards. As such, this analysis uses consumption as the measure of living standards rather than value added.

When measuring the impacts of the naval bases on the Sydney regional economy and New South Wales state economy, it is important to distinguish between the direct and indirect economic impacts of the facilities.

- *Direct impacts* on employment, industry value added and industry turnover are the result of the naval base operating within the Sydney region. For example, the direct contribution to employment in the Sydney region include staff who are employed to work at the bases, i.e. ADF, APS and contractor personnel. The direct contribution to turnover is the sum of payments made by the bases and contractors to wages and salaries, expenditure on intermediate goods and any profits made by Defence contractors based in New South Wales. The direct impact also includes visitor expenditure as the GIDP supports economic activity by hosting a large number of visitors each year from visiting RAN and international vessels. These visitors purchase local goods and services.

- *Indirect impacts* are the result of two factors. The first is the impact of consumer spending in the Sydney region by people who are employed directly by the naval bases. The second is the impact of additional spending by upstream businesses that supply goods and services to the facilities.

The direct impacts of the naval bases can be estimated in a relatively straightforward manner using available data on Defence expenditure, employment numbers and information on ship visits. Measuring the indirect impacts requires the use of economic modelling. Hence, the full economic impacts of the Defence facilities are modelled using KPMG Econtech's MMR model.

4.2 Murphy Model Regional (MMR)

KPMG Econtech's MMR is a CGE model that estimates the effects of policies that are state or region specific. The model divides Australia into 33 regions and 8 states and territories, and incorporates 18 industries which correspond to the ANZSIC used by the ABS. Each of the regions are modelled individually, following a consistent approach.

New South Wales is divided into eight separate sub-regions within the model: the North Western Statistical Region; the Remainder-Balance Sydney Major Statistical Region; the Hunter Statistical Region; the Illawarra Statistical Region; South Eastern Statistical Region; Richmond-Tweed and Mid-North Coast Statistical Regions; Northern, Far West-North Western and Central West Statistical Regions; and Murray-Murrumbidgee Statistical Region. These sub-regions are based on the statistical regions of the ABS Labour Force Survey. For this study, MMR has been further developed so that the Sydney Major Statistical Region is captured in the model. This is to better capture the impacts of the naval bases on the Sydney region.

MMR models the medium-term equilibrium for each regional economy that would be achieved over roughly three years. The salient feature of a medium-term equilibrium model is that it assumes capital stocks in each industry are fixed but labour is mobile. In other words, the three-year time frame is too short a time for investment to be realised as additional capital, so industries respond to shocks either by hiring additional workers or downsizing their labour force.

Importantly, the three-year time frame is considered long enough for businesses to adjust their prices in response to demand and supply shocks. MMR models price changes within the

economy by distinguishing between industries that produce tradeables and industries that produce non-tradeables.

Industries that produce goods traded between regions (goods and services that can be sold in the larger state or national market) are not subject to price changes within the regional economy. The reasoning behind this assumption is that prices for traded goods are set in the national (or international) market, so that shocks that are region specific will generally be too small to affect product prices at a national level. Further, businesses that produce traded goods have no incentive to lower their prices below the national level because they can always export their goods at the national price. Conversely, businesses that produce traded goods within a given region are unable to raise their prices above the national level as consumers will simply import goods at the national price from another region.

By contrast, industries that produce non-traded goods are subject to price changes within local regions. Businesses that produce non-traded goods within a given region are focused solely on serving the local market. Consequently, the price of such goods are set in the local market and are subject to local changes in supply and demand. Hence, a shock that increases the supply of a non-traded good will cause the price of that good to fall (all other things being equal). Likewise, a shock that boosts the demand for a non-traded good will cause the price of that good to rise (all other things being equal).

CGE models are a more robust method of estimating the economic impact of facilities than other types of models such as input-output models. While input-output (IO) modelling can give some indication of the areas likely to be impacted by a facility, a CGE model such as MMR.

A CGE model has two key advantages over the simpler approach of using an input-output model. Firstly, MMR takes into account that the structure of the economy responds to changes in relative prices and hence is not rigid; and secondly, as a regional CGE model, MMR also takes into account the important medium-run constraints on the regional economy – regional industry capital stocks, and regional saving. This leads to results that are conservative, but more credible, compared with those produced by input-output modelling. Input-output models are often criticised for providing overly-optimistic economic impact assessments of projects, unlike CGE models.

A summary of the features of the MMR is provided in Appendix B.

4.3 Scenarios

KPMG Econtech analysed a number of scenarios to estimate the current economic contributions of each of the naval bases to the Sydney regional economy and New South Wales state economy.

For each facility, KPMG Econtech modelled a scenario to measure the economic impact of the facility on the surrounding Sydney regional economy. KPMG Econtech also modelled an aggregate scenario showing the combined economic impact of the naval bases on the New South Wales state economy. These scenarios were then compared with baseline 'snapshots' of the regional and state economies to determine the current economic contribution of the facilities at the state and regional levels.

4.3.1 Sydney Major Statistical Region Scenarios

To estimate the economic contribution of GIDP, *Waterhen*, *Watson* and *Penguin* to the Sydney regional economy, the following scenarios were modelled using MMR:

- Sydney Baseline Scenario – a scenario that models the current Sydney regional economy, including the contribution made by Defence facilities located within the region i.e. a 'snapshot' of the current Sydney economy.
- GIDP Scenario – a scenario that models the economic impacts of removing GIDP from the Sydney regional economy.
- HMAS *Waterhen* Scenario – a scenario that models the economic impacts of removing *Waterhen* from the Sydney regional economy.
- HMAS *Watson* Scenario – a scenario that models the economic impacts of removing *Watson* from the Sydney regional economy.
- HMAS *Penguin* Scenario – a scenario that models the economic impacts of removing *Penguin* from the Sydney regional economy.

The current annual economic contribution of each base to the Sydney regional economy can thus be estimated by calculating the difference between each scenario and the Sydney Baseline Scenario. These scenarios include the bases' contribution to industry value added, industry turnover, industry employment and overall living standards in the Sydney regional economy.

4.3.2 New South Wales Scenarios

To estimate the economic contribution of the naval bases to the New South Wales state economy, the following scenarios were modelled using MMR:

- New South Wales Baseline Scenario – a scenario that models the current New South Wales state economy, including the contribution made by Defence facilities located within the state, i.e. a 'snapshot' of the current New South Wales economy.
- Naval Bases Scenario – a scenario that models the economic impacts of removing GIDP, *Waterhen*, *Watson*, and *Penguin* from the New South Wales state economy.

The current annual economic contribution of the four naval bases to the New South Wales state economy can thus be estimated by calculating the difference between the Naval Bases Scenario and the New South Wales Baseline Scenario.

4.4 Direct Impacts

The naval bases contribute directly to employment and expenditure in the regional economy. Estimates of the direct impacts for each facility have been used as inputs into MMR to determine the indirect or flow-on activity that is supported by the respective facilities.

For the purposes of this study, four major direct impacts have been identified and estimated to be used as inputs into MMR. These impacts represent the economic activity that would not occur within the regional economy if the naval bases ceased to operate within the region.

- Naval base employees – each facility directly employs permanent staff, including ADF and APS personnel.
- Contractor employees – the naval bases directly employ contractors to provide services such as facilities maintenance, equipment maintenance, and IT and technical support.
- Naval base expenditure – each naval base contributes directly to turnover in the regional economy through expenditure on goods and services, and through capital expenditure on equipment and infrastructure[8].
- Visitor expenditure – GIDP supports economic activity by hosting a large number of visitors each year from visiting RAN and international vessels. These visitors purchase local goods and services.

Estimates of the direct impacts of each facility were sourced primarily through consultation with Defence and relevant stakeholders. All estimates of direct impacts are based on employment and expenditure in the 2008/09 financial year.

The estimated direct impacts for each facility were converted into an appropriate data set to be used as an input into MMR. Notably, MMR can be used to simulate the economic impacts of the facilities using a range of different shock variables, including employment and expenditure. As such, estimates of employment and expenditure were used to reduce the relevant variables within MMR, to simulate the impact of removing the facilities from the regional economy in order to calculate their economic contribution. Specifically, estimated employment impacts were entered into MMR as employment shocks broken down by ANZSIC industry[9]. Estimated expenditure impacts were entered into MMR as expenditure shocks broken down by ANZSIC industry.

Where estimates of both employment and expenditure were available, employment impacts were used as the preferred shock variable in order to avoid double counting the direct impacts of facilities. Employment and expenditure are interlinked within the model, as expenditure on wages and operating costs is related to employment. As such, removing Defence employment from the model would impact on Defence expenditure in the model, and reducing Defence expenditure in the model would lead to lower Defence employment. Thus reducing both expenditure and employment for a given facility would double count the direct impact (unless the expenditure is not directly associated with employment at the facility).

[8] Note that capital expenditure only has a direct impact on the regional economy when assets are purchased from local sources. Capital expenditure on assets (e.g. hardware and equipment) imported into the region does not have a direct impact on the regional economy.
[9] Industry structure within MMR is based on ABS Input-Output tables, which are currently published according to the ANZSIC 1993.

4.4.1 Garden Island Defence Precinct Direct Impacts

GIDP contributes directly to the Sydney regional economy by employing staff and contractors, and by spending on operations and capital within the regional economy. The direct impact also includes visitor expenditure as the GIDP supports economic activity by hosting a large number of visitors each year from visiting RAN and international vessels. These visitors purchase local goods and services.

In 2008/09, GIDP is estimated to have directly employed a total of 4,180.5 Full Time Equivalents (FTE), which were predominantly Defence employees and contractors. These employees are split between two industries, Government Administration and Defence and Property and Business Services.

In 2008/09, GIDP is estimated to have spent $316.99 million on wages, capital and operating expenses. A breakdown of these expenses is presented in the following Table. The information contained in the following table has been provided by Defence unless otherwise stated.

Table 4.2: Garden Island Defence Precinct Expenses ($2008/09)

Garden Island Defence Precinct		
Expense Category		**Expenditure ($m)**
Salaries*	$	273.10
Transport	$	0.52
Utilities (Electric)	$	4.05
Utilities (Gas)	$	0.06
Utilities (water, sewerage)	$	0.30
Garrison Support	$	13.25
CMS Fees	$	0.95
Rations	$	0.74
General Supplies (Stationery, cameras, other minor or unspecified purchases)	$	0.09
Operating Plant and equipment	$	0.86
Facilities Operations (FACOPS)	$	23.07
Total Expenditure	**$**	**316.99**

** Due to contractual arragements, some salaries have not been provided*

Importantly, GIDP supports expenditure in the regional economy by hosting both visiting RAN and international vessels. This leads to induced spending in the regional economy by the high visitor numbers from these vessels. Spending by these visitors is induced in the sense that the visitors would not have spent money in the Sydney regional economy if their vessels had not visited GIDP. As such, this expenditure can be categorised as a direct impact of GIDP. This has flow-on impacts as visitors spend on local goods and services and stimulate the supply chain of businesses that sell consumer goods.

The Northern Territory's Department of Business, Economic and Regional Development assessed the economic impact of naval ship visits to the Port of Darwin. The study uses a 2007 survey on crew expenditure spend to estimate the approximate economic value of ship visits in Darwin from 1999 to 2007. Crew members from five RAN ships and one United States Navy ship were surveyed. The survey estimated that the average spend per sailor per day was $227.90. This is a more accurate representation of sailors spending habits than a typical visitor to the Sydney region. For example, visitors spend on average 20 per cent on accommodation services[10] whereas sailors spend only 10 per cent Further, research on visitor spending habits

[10] ABS *5249.0 Tourism Satellite Account* Table 14

demonstrate that the daily average expenditure is higher for visitors of Sydney than for visitors to Darwin. Based on this information, the daily expenditure of a sailor visiting the Port of Darwin was scaled to correlate with the higher visitor expenditure in the Sydney region compared to the Darwin region.

On average, an additional 4,000 sailors[11] visit GIDP annually due to visits by RAN ships (those not home-ported at GIDP) and international ships. It is estimated that these additional visitors spend $11.8 million (2008-09 dollars) in the Sydney regional economy.

The estimated value of spending has been allocated across the ANZSIC industries used in MMR to capture the increased activity from the naval ship visits to the region. The Darwin survey provides estimates of the spend patterns of the visiting sailors, broken into eight expense categories: Accommodation, Cafes and Restaurants, Electronic Equipment, Entertainment, Internet and Phone, Public Bars and Clubs, Shopping and Transportation. As such, the crew spend has been allocated across a number of ANZSIC industries, based on turnover, as presented in the following table.

Table 4.4: Estimated value of naval ship visit to the Port of Sydney by ANZSIC industry

Estimated Value of the sector by MMR Industry	
Industry	**Expenditure ($m)**
Retail Trade	3.05
Accommodation, Cafes and Restaurants	6.85
Transport and Storage	1.00
Cultural and Recreational Services	0.94
Total	**11.84**

Source: KPMG Econtech estimates

Modelling Inputs

Based on the estimates presented above, both the direct employment and visitor expenditure impacts were identified as an appropriate input to model the economic impacts of GIDP. The modelling inputs for GIDP are presented in the following table.

Table 4.5: Garden Island Defence Precinct Modelling Inputs

Garden Island Defence Precinct		
Industry	**Employment (jobs)**	**Expenditure ($m)**
Retail Trade	-	3.05
Accommodation, Cafes and Restaurants	-	6.85
Transport and Storage	-	1.00
Property and Business Services	201	-
Government Administration	3980	-
Cultural and Recreational Services	-	0.94
Total	**4181**	**11.84**

Source: KPMG Econtech estimates based on information provided by the Department of Defence

[11] Information on Allied and non-homeported vessels has been provided to KPMG Econtech by Department of Defence

4.4.2 HMAS *Waterhen* Direct Impacts

In 2008/09, *Waterhen* is estimated to have directly employed a total of 690 FTEs, which are predominantly Defence employees and contractors. These employees are split between two industries, Government Administration and Defence and Property and Business Services.

In 2008/09, *Waterhen* is estimated to have spent $8.58 million on wages, capital and operating expenses. A breakdown of these expenses is presented in the following table.

Table 4.6: HMAS Waterhen Expenses ($2008/09)

HMAS *Waterhen*		
Expense Category		**Expenditure ($m)**
Salaries*	$	2.16
Transport	$	0.52
Utilities (water, sewerage)	$	0.08
Garrison Support	$	3.35
CMS Fees	$	0.63
Rations	$	0.32
General Supplies (Stationery, cameras, other minor or unspecified purchases)	$	0.03
Operating Plant and equipment	$	0.58
Facilities Operations (FACOPS)^	$	0.91
Total Expenditure	**$**	**8.58**

** Due to contractual arragements, some salaries have not been provided*

^ Average expenditure between 2004-05 to 2008-09

Modelling Inputs

Based on the estimates presented above, the direct employment impacts were identified as an appropriate input to model the economic impacts of *Waterhen*. The modelling inputs for *Waterhen* are presented in the following table.

Table 4.7: HMAS Waterhen Modelling Inputs ($2008/09)

HMAS *Waterhen*	
Industry Classification	**Number of FTE's (jobs)**
Property and Business Services	29.0
Government Administration and Defence	661.0
Total	**690.0**

Source: KPMG Econtech estimates based on information provided by the Department of Defence

4.4.3 HMAS *Watson* Direct Impacts

In 2008/09, *Watson* is estimated to have directly employed a total of 438.8 FTEs, which are predominantly Defence employees and contractors. These employees are split between two industries, Government Administration and Defence and Property and Business Services.

In 2008/09, *Watson* is estimated to have spent $43.20 million on wages, capital and operating expenses. A breakdown of these expenses is presented in the following table.

Table 4.8: HMAS Watson Expenses ($2008/09)

HMAS *Watson*		
Expense Category		Expenditure ($m)
Salaries*	$	34.26
Transport	$	0.52
Utilities (water, sewerage)	$	0.04
Garrison Support	$	5.03
CMS Fees	$	0.79
Rations	$	0.38
General Supplies (Stationery, cameras, other minor or unspecified purchases)	$	0.02
Operating Plant and equipment	$	0.72
Facilities Operations (FACOPS)^	$	1.43
Total Expenditure	**$**	**43.20**

** Due to contractual arragements, some salaries have not been provided*

^ Average expenditure between 2004-05 to 2008-09

Modelling Inputs

Based on the estimates presented above, the direct employment impacts were identified as an appropriate input to model the economic impacts of *Watson*. The modelling inputs for *Watson* are presented in the following table.

Table 4.9: HMAS Watson Modelling Inputs ($2008/09)

HMAS *Watson*	
Industry Classification	**Number of FTE's (jobs)**
Property and Business Services	5.0
Government Administration and Defence	433.8
Total	**438.8**

Source: KPMG Econtech estimates based on information provided by the Department of Defence

4.4.4 HMAS *Penguin* Direct Impacts

In 2008/09, *Penguin* is estimated to have directly employed a total of 378 FTEs, which are predominantly Defence employees and contractors. These employees are split between the Government Administration and Defence and Property and Business Services industries.

In 2008/09, *Penguin* is estimated to have spent $20.95 million on wages, capital and operating expenses. A breakdown of these expenses is presented in the following table.

Table 4.10: HMAS Penguin Expenses ($2008/09)

HMAS *Penguin*		
Expense Category		**Expenditure ($m)**
Salaries*	$	11.31
Transport	$	0.52
Utilities (water, sewerage)	$	0.14
Garrison Support	$	4.63
CMS Fees	$	0.79
Rations	$	0.54
General Supplies (Stationery, cameras, other minor or unspecified purchases)	$	0.04
Operating Plant and equipment	$	0.72
Facilities Operations (FACOPS)^	$	2.26
Total Expenditure	**$**	**20.95**

** Due to contractual arragements, some salaries have not been provided*

^ Average expenditure between 2004-05 to 2008-09

Modelling Inputs

Based on the estimates presented above, the direct employment impacts were identified as an appropriate input to model the economic impacts of *Penguin*. The modelling inputs for *Penguin* are presented in the following table.

Table 4.11: HMAS Penguin Modelling Inputs ($2008/09)

HMAS *Penguin*	
Industry Classification	**Number of FTE's (jobs)**
Property and Business Services	5.0
Government Administration and Defence	373.0
Total	**378.0**

Source: KPMG Econtech estimates based on information provided by the Department of Defence

4.4.5 New South Wales Direct Impacts

The direct impact of all four naval bases on the New South Wales state economy is estimated as the sum of employment and expenditure impacts of each facility. The direct impact includes the increased activity from the RAN and international ships that visit GIDP.

In 2008/09, the four naval bases are estimated to have directly employed a total of 5,784 FTEs, which are predominantly Defence employees and contractors. These employees are split between the Government Administration and Defence and Property and Business Services industries.

In 2008/09, the naval bases are estimated to have spent $389.72 million in New South Wales on wages, capital and operating expenses. A breakdown of these expenses is presented in the following table.

Table 4.12: New South Wales Expenses ($2008/09)

New South Wales		
Expense Category		**Expenditure ($m)**
Salaries*	$	320.83
Transport	$	2.09
Utilities	$	4.66
Garrison Support	$	26.27
CMS Fees	$	3.17
Rations	$	1.97
General Supplies (Stationery, cameras, other minor or unspecified purchases)	$	0.18
Operating Plant and equipment	$	2.88
Facilities Operations (FACOPS)	$	27.67
Total Expenditure	**$**	**389.72**

** Due to contractual arragements, some salaries have not been provided*

^ Average expenditure between 2004-05 to 2008-09

In addition, visitors from naval ships induce spending in the New South Wales state economy. The estimated value of the sector has been allocated across the ANZSIC industries used in MMR to capture the increased activity from the naval ship visits The method for capturing the induced visitor expenditure is outlined in detail in section 4.4.

The modelling inputs for the combined naval bases in Sydney are presented in following table.

Table 4.13: New South Wales Modelling Inputs ($2008/09)

New South Wales		
Industry	**Employment (jobs)**	**Expenditure ($m)**
Retail Trade	-	3.05
Accommodation, Cafes and Restaurants	-	6.85
Transport and Storage	-	1.00
Property and Business Services	240	-
Government Administration	5447	-
Cultural and Recreational Services	-	0.94
Total	**5687**	**11.84**

Source: KPMG Econtech estimates based on information provided by the Department of Defence

5 Economic Impact of Naval Bases on the Sydney Regional Economy

When measuring the impacts of the naval bases on the Sydney regional economy, it is important to capture both the direct and indirect economic impacts of the facilities. While section 4 estimated the direct impacts of each facility, economic modelling is required to capture the indirect or flow-on impacts of each facility. This section presents estimates of the combined direct and indirect impacts of each facility on the Sydney regional economy.

The following estimates of employment, value added and consumption impacts represent the average annual economic contribution of the facilities. The results in this report are expressed[12] in 2009/10 dollars based on reported activity in 2008/09.

The section is structured as follows.

- Section 5.1 details the economic impacts of GIDP on the Sydney regional economy.
- Section 5.2 presents the economic impacts of HMAS Waterhen on the Sydney regional economy.
- Section 5.3 presents the economic impacts of HMAS Watson on the Sydney regional economy.
- Section 5.4 presents the economic impacts of HMAS Penguin on the Sydney regional economy.

More detailed results (including estimates of turnover impacts) are provided in Appendix A.

5.1 Garden Island Defence Precinct (GIDP)

Employment

The modelling estimates that GIDP directly and indirectly supports 6,784 jobs in the Sydney regional economy. GIDP employs the largest number of personnel of the four naval bases. These jobs are distributed amongst different industry sectors as indicated in Chart 5.1. below.

A sizable proportion of the overall employment impact occurs in the Government Administration and Defence industry as GIDP directly employs a large number of ADF and APS staff. These direct employment impacts produce positive indirect employment impacts in industries that supply goods and services to GIDP and sell consumer goods to GIDP employees.

The naval bases create additional employment in industries that sell goods and services to the facilities, and in businesses that sell consumer goods to the Defence employees and contractors like Serco Sodexo Defence Services. Such businesses benefit from the additional demand created by the naval bases. Expenditure by Defence employees and contractors indirectly supports employment in consumer-focused industries including Retail Trade, Finance and Insurance, Education and Health and Community Services.

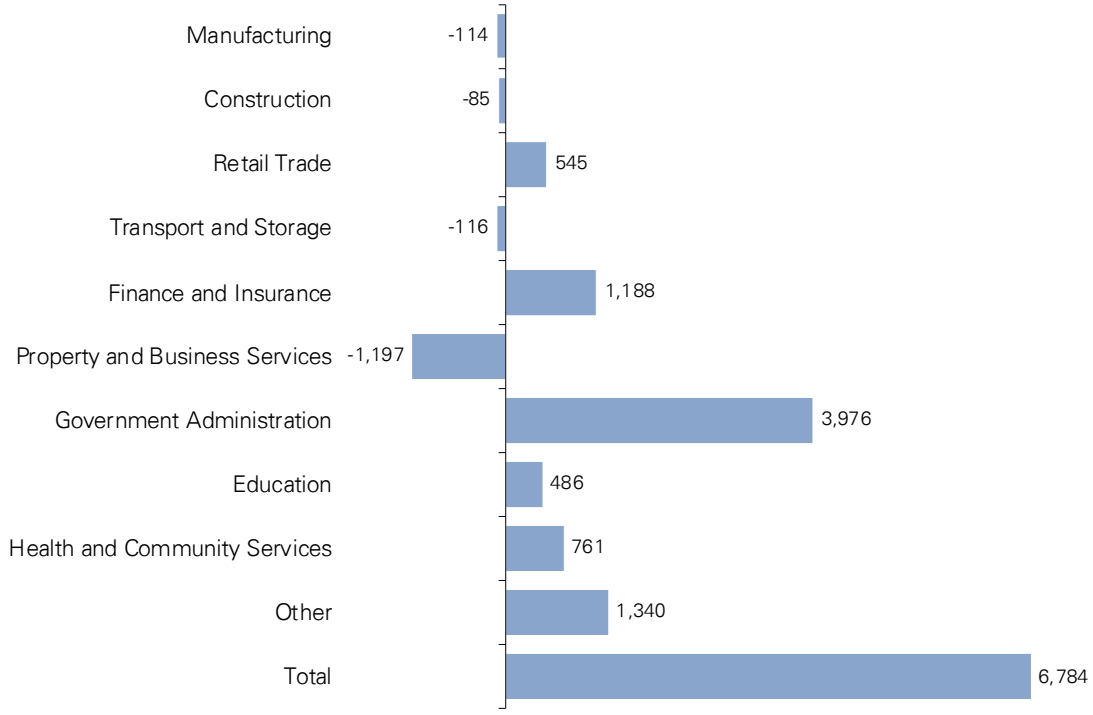
[12] Results including expenditure categories outlined in Chapter 5 and 6 have been scaled from the 2008/09 financial year to 2009/10 financial year.

Conversely, GIDP is also estimated to have a negative impact on some industries as expenditure by GIDP on goods and services within the Sydney regional economy contributes to price pressures within some sectors. By contributing to demand in the regional economy, GIDP places upward pressure on the prices of goods and services that are not traded between regions. As such, some employment pressures are felt in industries that experience reducedof competitiveness through higher input prices. It is estimated that GIDP causes indirect employment pressures on industries including Manufacturing, Construction, Transport and Storage and Property and Business Services.

The Property and Business services industry, in particular, experiences pressures due to higher input prices, as it uses similar inputs as the Government Administration and Defence industry, i.e. it competes directly with GIDP for resources. Although GIDP directly employs staff within the industry, this is exceeded by the price impact when compared to the baseline scenario.

Overall, however, the net effect on employment is significantly positive. GIDP increases employment in the Sydney regional economy by 6,784 jobs when compared to the baseline scenario.

Chart 5.1 GIDP Contribution to Employment in Sydney (jobs)

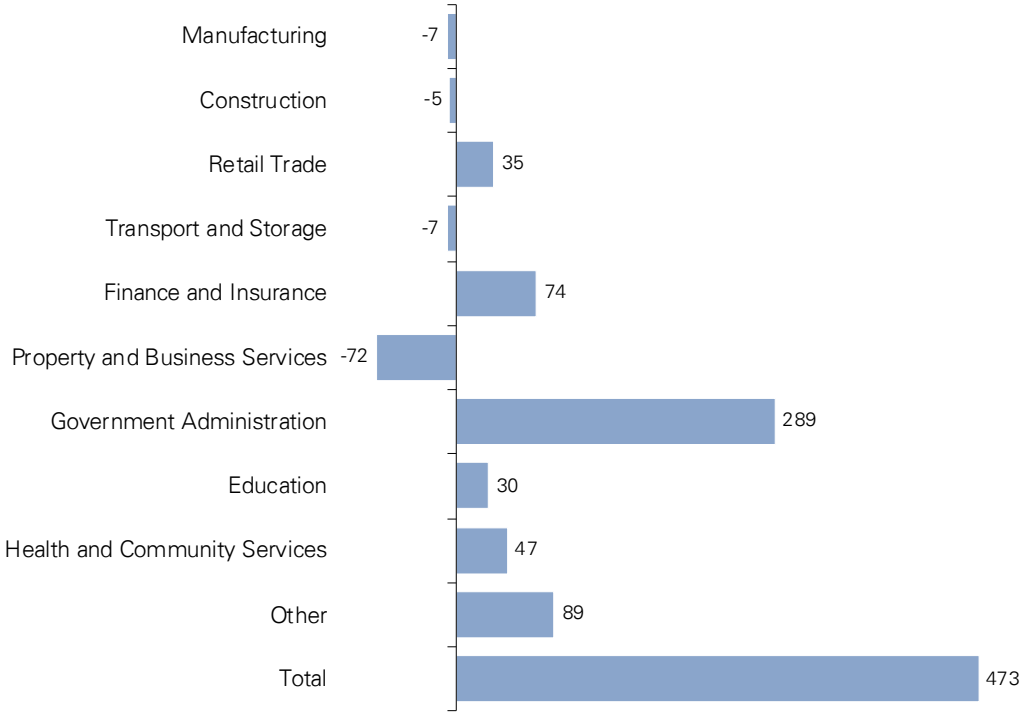


Source: KPMG Econtech MMR
Note: The sum of impacts may not add exactly to total due to rounding.

Value Added

The modelling estimates that GIDP directly and indirectly contributes $473 million (2009/10 prices) annually to value added in the Sydney regional economy. This impact is distributed amongst different industry sectors, as indicated in Chart 5.2.

Chart 5.2 GIDP Contribution to Value Added in Sydney ($2009/10 m)



Source: KPMG Econtech MMR
Note: The sum of impacts may not add exactly to total due to rounding.

Similar to the employment impacts, the bulk of the value added contribution occurs in the Government Administration and Defence industry ($289 million). Impacts in this industry can be primarily attributed to wage payments made by GIDP.

The pattern of indirect value added impacts mirror the employment impacts, with positive indirect impacts occurring in industries such as Finance and Insurance, Health and Community Services and Retail Trade. Likewise, indirect pressures occur in industries that experience reduced competitiveness due to increased input prices. The largest impact is in Property and Business Services.

Overall, however, the net effect on value added is significantly positive. GIDP increases value added in the Sydney regional economy by $473 million when compared to the baseline scenario.

Living Standards

By supporting production in the regional economy, GIDP contributes to living standards in Sydney. The modelling estimates that GIDP contributes $528 million annually to consumption in the Sydney regional economy.

Summary

The modelling estimates that GIDP directly and indirectly supports 6,784 jobs in the Sydney region. That is, total employment in the Sydney region is 0.29 per cent greater than would otherwise be the case if the base did not operate in the region. This includes a 3.98 per cent increase in employment in the Government Administration and Defence industry, 0.51 per cent increase in employment in the Finance and Insurance industry and a 0.32 per cent increase in employment in the Retail Trade industry than would otherwise be the case.

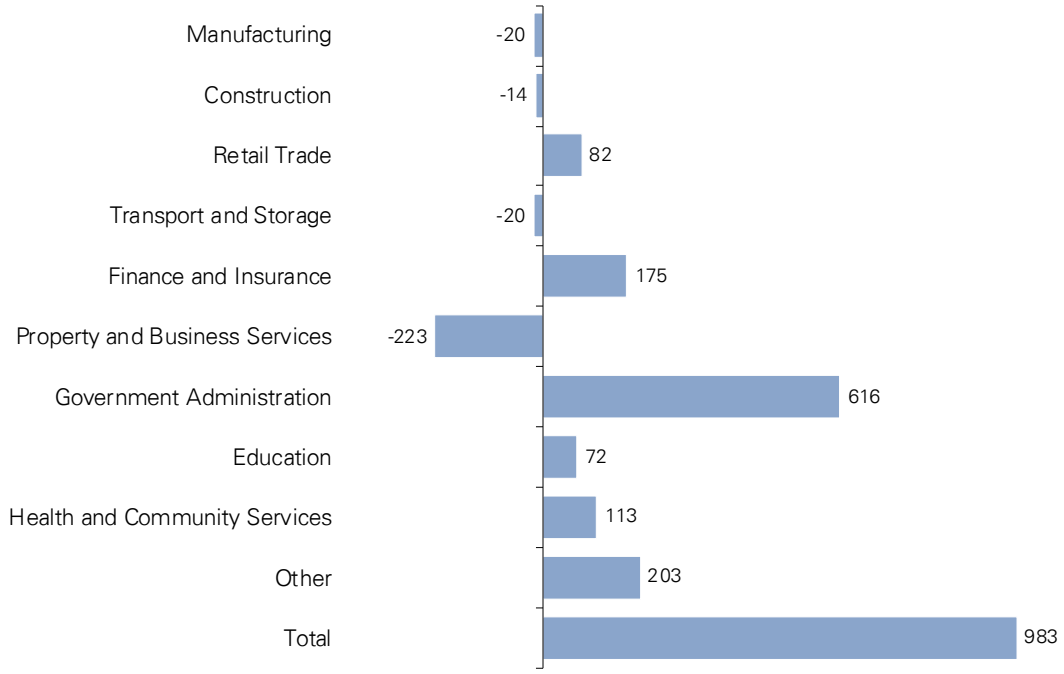
Overall, GIDP directly and indirectly contributes $473 million (2009/10 prices) annually to value added and contributes $528 million ($2009/10 prices) annually to consumption in the Sydney regional economy. GIDP's operation results in a 0.21 per cent gain in valued added and a 0.10 per cent gain in consumption in the Sydney region.

5.2 HMAS *WATERHEN*

Employment

The modelling estimates that *Waterhen* directly and indirectly supports 938 jobs in the Sydney regional economy. These jobs are distributed amongst different industry sectors as indicated in Chart 5.3.

Chart 5.3 HMAS Waterhen Contribution to Employment in Sydney (jobs)



Source: KPMG Econtech MMR
Note: The sum of impacts may not add exactly to total due to rounding.

The largest employment impact occurs in the Government Administration and Defence industry (616 jobs). This is due to the direct employment of ADF and APS staff by *Waterhen*. These direct employment impacts produce positive indirect employment impacts in industries that sell consumer goods to *Waterhen* employees and supply goods and services to *Waterhen*. Industries that benefit from demand created by *Waterhen* in the Sydney regional economy include Retail Trade, Finance and Insurance, Education, and Health and Community Services.

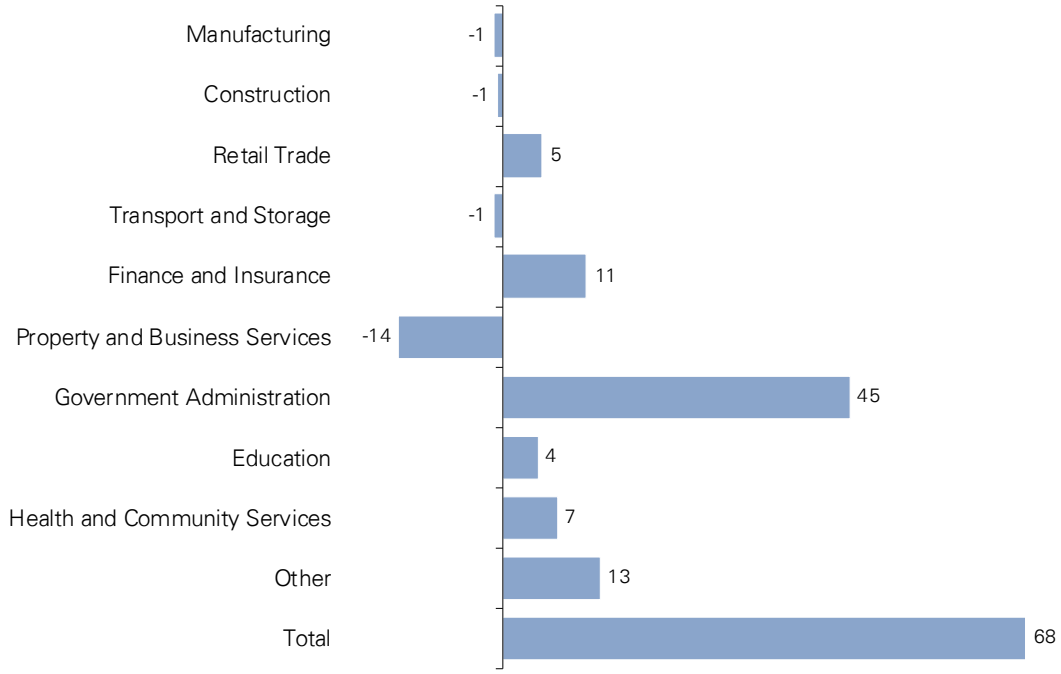
At the same time, expenditure by *Waterhen* on goods and services within the Sydney regional economy contributes to price pressures within some industries. As such, some employment pressures are felt in industries that experience reduced competitiveness through higher input prices. For example, it is estimated that *Waterhen* causes indirect employment pressures on industries including Manufacturing, Construction, Transport and Storage, and Property and Business Services. The largest impact is in the Property and Business Services industry due to higher input prices as the industry uses similar inputs to Government Defence and Administration i.e. it competes directly with *Waterhen* for resources.

Overall, however, the net effect on employment is positive. *Waterhen* increases employment in the Sydney regional economy by 983 jobs when compared to the baseline scenario.

Value Added

The modelling estimates that *Waterhen* directly and indirectly contributes $68 million (2009/10 prices) annually to value added in the Sydney regional economy. This impact is distributed amongst different industry sectors as indicated in Chart 5.4. As with the employment impacts, a large proportion of the value added contribution occurs in the Government Administration and Defence industry ($45 million).

Chart 5.4 HMAS Waterhen Contribution to Value Added in Sydney ($2009/10 m)



Source: KPMG Econtech MMR
Note: The sum of impacts may not add exactly to total due to rounding.

Living Standards

By supporting production in the regional economy, *Waterhen* contributes to living standards in Sydney. The modelling estimates that *Waterhen* contributes $76.5 million ($2009/10 prices) annually to consumption in the Sydney regional economy.

Summary

The modelling estimates that *Waterhen* directly and indirectly supports 983 jobs in the Sydney regional economy. That is, total employment in the Sydney regional economy is 0.04 per cent greater than would otherwise be the case if the base did not operate in the region. This includes a 0.62 per cent increase in employment in the Government Administration and Defence industry, 0.08 per cent increase in employment in the Finance and Insurance industry and a 0.05 per cent increase in employment in the Retail Trade industry than would otherwise be the case.

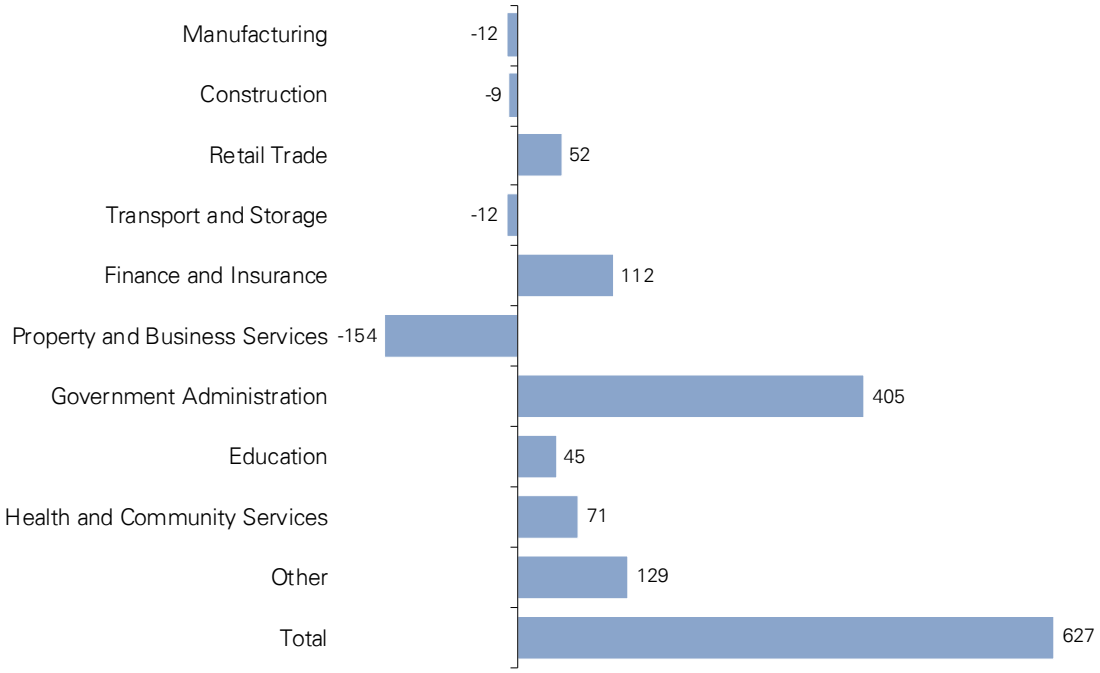
Overall, *Waterhen* directly and indirectly contributes $68 million (2009/10 prices) annually to value added, and contributes $76.5 million ($2009/10 prices) annually to consumption in the Sydney regional economy. *Waterhen*'s operation results in a 0.03 per cent gain in valued added and a 0.01 per cent gain in consumption in the Sydney regional economy.

5.3 HMAS *WATSON*

Employment

The modelling estimates that *Watson* directly and indirectly supports 627 jobs in the Sydney regional economy. These jobs are distributed amongst different industry sectors as indicated in Chart 5.5.

Chart 5.5 HMAS Watson Contribution to Employment in Sydney (jobs)



Source: KPMG Econtech MMR
Note: The sum of impacts may not add exactly to total due to rounding.

The largest employment impact occurs in the Government Administration and Defence industry (405 jobs) as a result of the direct employment impacts of the naval base. These direct employment impacts produce positive indirect employment impacts in industries that supply the base and its contractors, and industries that sell consumer goods to the ADF, APS and contractor employees. The industries that benefit from higher demand include Retail Trade, Finance and Insurance, Education and Health and Community Services.

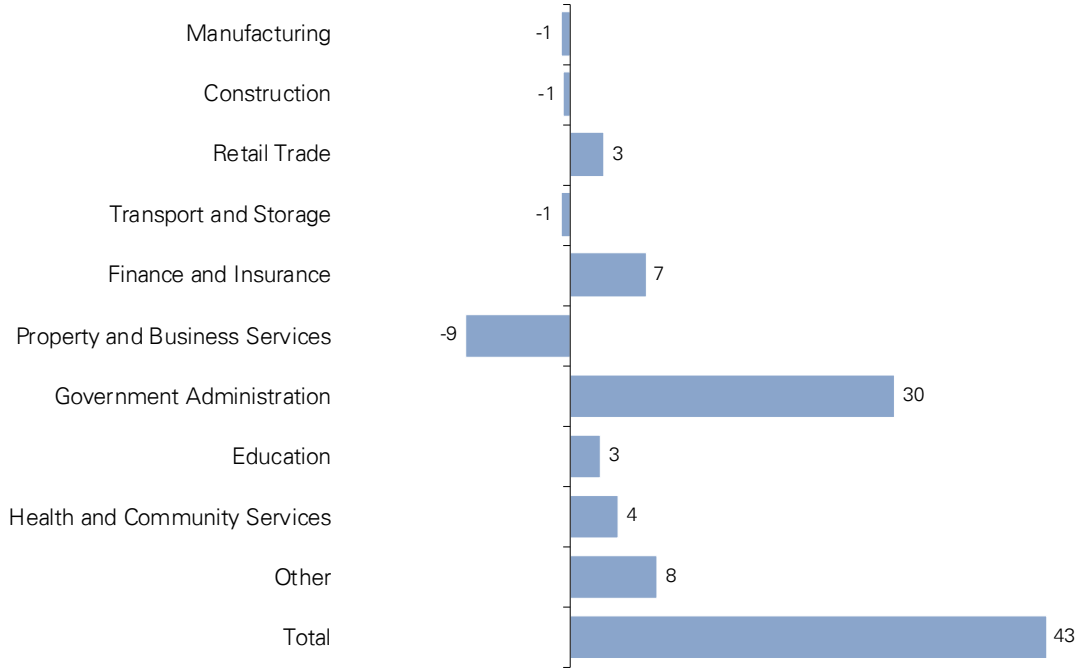
At the same time, expenditure by *Watson* and its contractors contributes to price pressures for some goods and services in the Sydney regional economy. This causes employment pressures in some industries by pushing up input prices, despite the fact that the base directly employs a number of contractors in those industries. The modelling estimates that *Watson* causes indirect employment pressures in industries including Manufacturing, Construction, Transport and Storage and Property and Business Services.

Overall, however, the net effect on employment is positive. *Watson* increases employment in the Sydney regional economy by 627 jobs when compared to the baseline scenario.

Value Added

The modelling estimates that *Watson* directly and indirectly contributes $43 million (2009/10 prices) annually to value added in the Sydney regional economy. This impact is distributed amongst different industry sectors, as indicated in Chart 5.6.

Chart 5.6 HMAS Watson Contribution to Value Added in Sydney ($2009/10 m)



Source: KPMG Econtech MMR
Note: The sum of impacts may not add exactly to total due to rounding.

Similar to the employment impacts, the bulk of the value added contribution occurs in the Government Administration and Defence industry ($30 million). Impacts in this industry can be primarily attributed to wage payments made by *Watson*. The pattern of indirect value added impacts mirror the employment impacts, with positive indirect impacts occurring in consumer focused industries such as Finance and Insurance and Health and Community Services. Likewise, indirect pressures occur in industries that experience reduced competitiveness due to increased input prices. This includes Manufacturing, Construction, Transport and Storage and Property and Business Services.

Overall, however, the net effect on value added is positive. *Watson* increases value added in the Sydney regional economy by $43 million when compared to the baseline scenario.

Living Standards

By supporting production in the regional economy, *Watson* contributes to living standards in Sydney. The modelling estimates that *Watson* contributes $48.7 million annually to consumption in the Sydney regional economy.

Summary

The modelling estimates that *Watson* directly and indirectly supports 627 jobs in the Sydney regional economy. That is, total employment in the Sydney regional economy is 0.03 per cent greater than would otherwise be the case if the base did not operate in the region. This includes a 0.41 per cent increase in employment in the Government Administration and Defence industry, 0.05 per cent increase in employment in the Finance and Insurance industry and a 0.03 per cent increase in employment in the Retail Trade industry than would otherwise be the case.

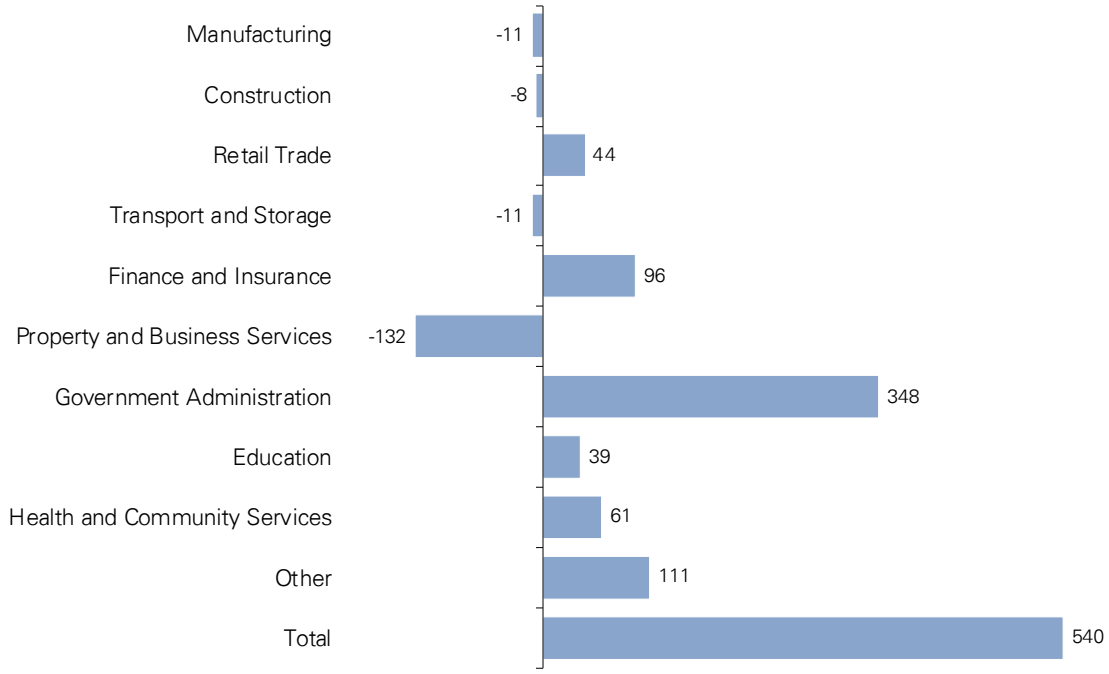
Overall, *Watson* directly and indirectly contributes $43 million (2009/10 prices) annually to value added, and contributes $49 million ($2009/10 prices) annually to consumption in the Sydney regional economy. *Watson*'s operation results in a 0.02 per cent gain in valued added and a 0.01 per cent gain in consumption in the Sydney regional economy.

5.4 HMAS *PENGUIN*

Employment

The modelling estimates that *Penguin* directly and indirectly supports 540 jobs in the Sydney regional economy. These jobs are distributed amongst different industry sectors as indicated in Chart 5.7.

Chart 5.7 HMAS Penguin Contribution to Employment in Sydney (jobs)



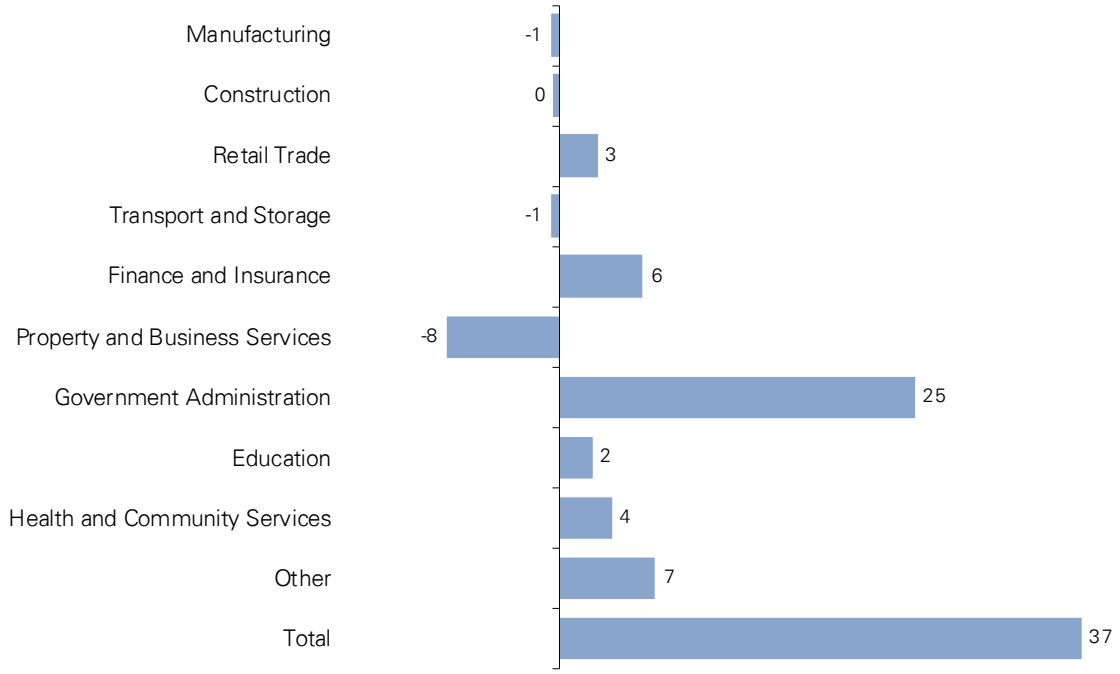
Source: KPMG Econtech MMR
Note: The sum of impacts may not add exactly to total due to rounding.

The largest employment impact occurs in the Government Administration and Defence industry (348 jobs), as *Penguin* directly employs a large number of ADF and APS staff. These direct employment impacts produce positive indirect employment impacts in industries that supply goods and services to *Penguin* and sell consumer goods to *Penguin* employees. Retail Trade, Finance and Insurance, Education and Health and Community Services industries benefit from demand created by *Penguin* in the Sydney regional economy.

Value Added

The modelling estimates that *Penguin* directly and indirectly contributes $37 million (2009/10 prices) annually to value added in the Sydney regional economy. This impact is distributed amongst different industry sectors, as indicated in Chart 5.8.

Chart 5.8 HMAS Penguin Contribution to Value Added in Sydney ($2009/10 m)



Source: KPMG Econtech MMR
Note: The sum of impacts may not add exactly to total due to rounding.

The bulk of the value added contribution occurs in the Government Administration and Defence industry ($25 million), and is primarily attributable to wage payments made by *Penguin*. The pattern of indirect value added impacts mirror the employment impacts, with positive indirect impacts occurring in industries such as Finance and Insurance and Health and Community Services. Indirect pressures occur in industries that experience reduced competitiveness due to increased input prices, including Manufacturing, Construction, Transport and Storage and Property and Business Services.

Living Standards

By supporting production in the regional economy, *Penguin* contributes to living standards in Sydney. The modelling estimates that *Penguin* contributes $41.9 million annually to consumption in the Sydney regional economy.

Summary

The modelling estimates that *Penguin* directly and indirectly supports 540 jobs in the Sydney regional economy. That is, total employment in the Sydney regional economy is 0.02 per cent greater than would otherwise be the case if the base did not operate in the region. This includes a 0.35 per cent increase in employment in the Government Administration and Defence industry, 0.04 per cent increase in employment in the Finance and Insurance industry and a 0.03 per cent increase in employment in the Retail Trade industry than would otherwise be the case. *Penguin*'s operation results in a 0.02 per cent gain in valued added and a 0.01 per cent gain in consumption in the Sydney regional economy.

Overall, *Penguin* directly and indirectly contributes $37 million (2009/10 prices) annually to value added, and contributes $42 million ($2009/10 prices) annually to consumption in the Sydney regional economy.

6 Economic Impact of Naval Bases on the State Economy

The following section outlines the modelling results for the contribution of GIDP, *Waterhen*, *Watson* and *Penguin* to the New South Wales state economy. While section 4 estimated the direct impacts of each facility, economic modelling is required to capture the indirect or flow-on impacts of the naval bases. This section estimates the combined direct and indirect impacts of the naval bases on the New South Wales state economy.

The following estimates of employment, value added and consumption impacts represent the average annual economic impacts attributable to the bases. The results in this report are expressed[13] in 2009/10 dollars based on reported activity in 2008/09.

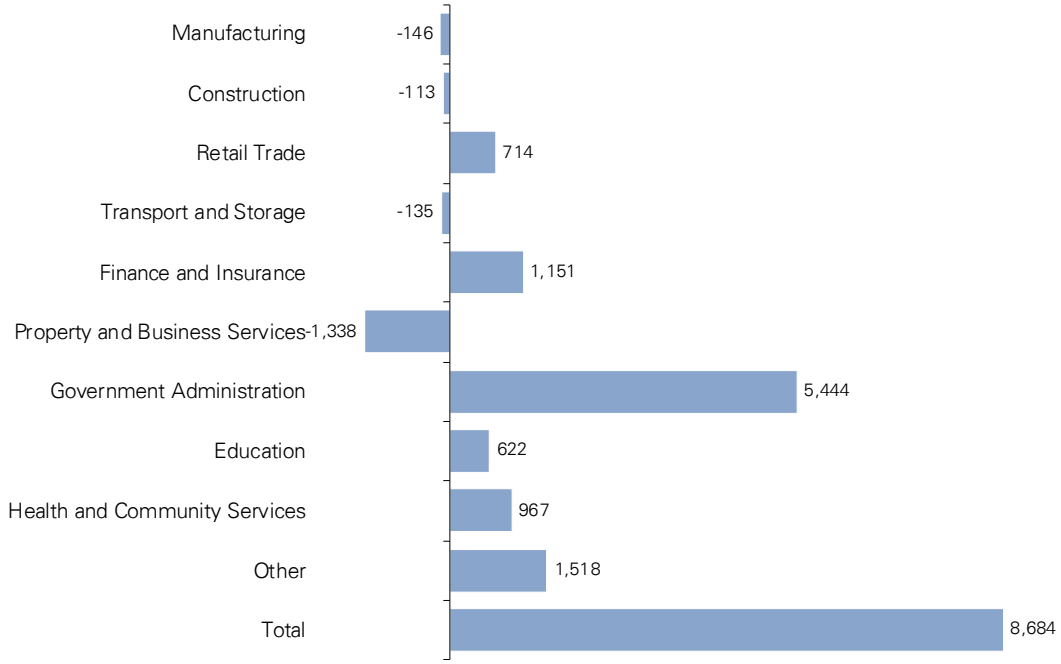
Section 6.1 details the employment impacts broken down by industry sector. Section 6.2 presents the estimated value added impacts broken down by industry sector. Section 6.3 presents the estimated contribution that the four naval bases make to living standards in New South Wales.

More detailed results (including estimates of turnover impacts) are provided in Appendix A.

6.1 Employment

The modelling estimates that the four naval bases currently support 8,684 jobs in the New South Wales state economy. Chart 6.1 shows the distribution of jobs across different industry sectors as a result of the direct and indirect impacts that the naval bases have on economic activity.

Chart 6.1 Defence Facility Contribution to Employment in NSW (jobs)



Source: KPMG Econtech MMR
Note: The sum of impacts may not add exactly to total due to rounding.

[13] Results including expenditure categories outlined in Chapter 5 and 6 have been scaled from the 2008/09 financial year to 2009/10 financial year.

The direct impacts of the naval bases include jobs that are directly supported within the bases as well as employees of contractors that provide services to the bases. The naval bases support substantial direct employment in the Government Administration and Defence industry (5,444 jobs). At the same time, the naval bases create additional employment in industries that sell goods and services to the facilities, and in businesses that sell consumer goods to the bases' employees and contractors.

Expenditure by employees of the naval bases and their contractors indirectly supports employment in consumer-focused industries within the state. Industries that benefit from this expenditure include Retail Trade, Education, and Health and Community Services. Similarly, the naval bases and contractors purchase insurance and financial advisory services, indirectly supporting employment in the Finance and Insurance industry.

Conversely, the naval bases are also estimated to cause employment pressures on some industries. By contributing to demand in the state economy, the bases put upward pressure on the prices of goods and services that are not traded between states. As such, some employment impacts are felt in industries that experience reduced competitiveness through higher input prices.

Despite directly employing some jobs in the Property and Business Services industry, the bases' expenditure causes employment pressure on the Property and Business Services industry. The Government Administration and Defence industry competes with Property and Business Services industry for inputs, raising some prices. Higher input prices result in employment pressures in the Construction industry and the Transport and Storage industry.

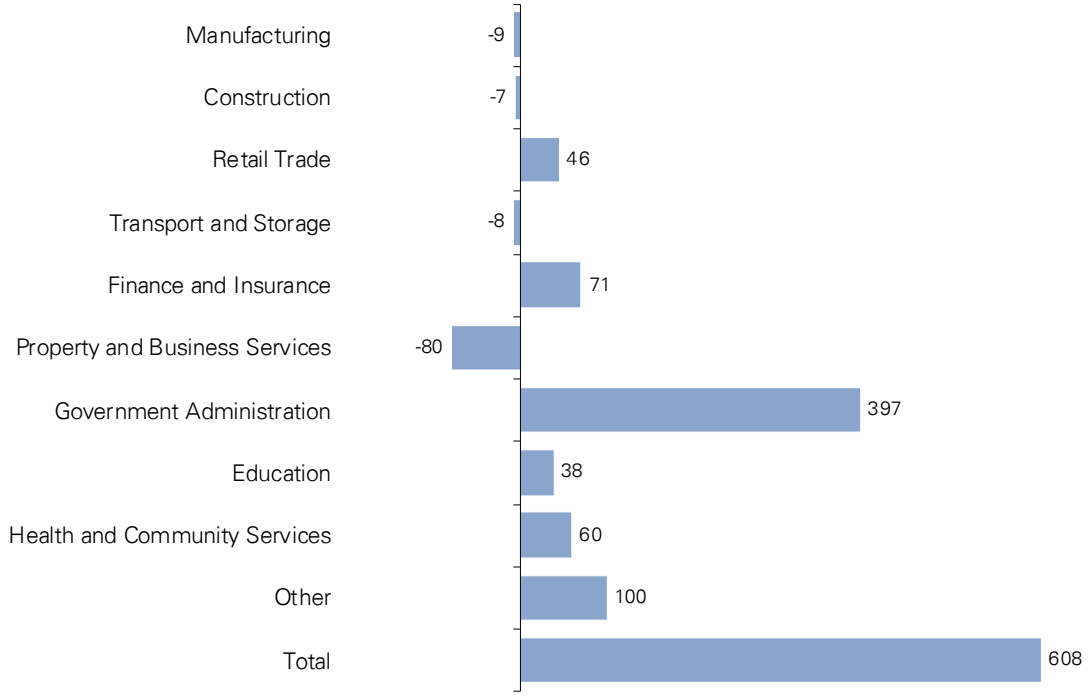
Overall, however, the net effect on employment is significantly positive.

6.2 Value Added

The modelling estimates that the four naval bases currently contribute $608 million (2009/10 prices) annually to value added in the New South Wales state economy. This is broadly equivalent to the bases' contribution to New South Wales GSP.

As illustrated in Chart 6.2 value added impacts are estimated to vary between industries as a result of direct and indirect impacts.

Chart 6.2 Defence Facility Contribution to Value Added in New South Wales ($2009/10 m)



Source: KPMG Econtech MMR
Note: The sum of impacts may not add exactly to total due to rounding.

As was the case at the region level, the value added impacts mirror the employment impacts. Industries that benefit from the naval bases' activity include Retail Trade, Finance and Insurance, Education and Health and Community Services. All of these industries receive a positive contribution to value added through sales to naval bases, their employees and contractors. Conversely, some industries experience negative value added impacts as a result of higher input prices, such as Construction, Transport and Storage and Property and Business Services.

6.3 Living Standards

By supporting production (value added) in the state economy, the four naval bases contribute to living standards in New South Wales.

As outlined in Section 4.1, living standards are often measured in terms of gross domestic product (or value added). However, this is not a good measure of living standards because value added is a measure of output, rather than a measure of well-being. As living standards derive from consumption, not value added, consumption (in principle) is a more appropriate measure of changes in living standards. As such, in line with the Productivity Commission's practice when measuring living standards, KPMG Econtech uses consumption as the measure of living standards instead of value added.

The four naval bases are estimated to contribute $613 million (2009/10 prices) annually to consumption in the New South Wales state economy.

7 Conclusions

The results of the analysis find that naval bases make a significant contribution to employment and output in the Sydney regional economy and New South Wales state economy. To capture the economic contribution of the Naval bases, the modelling assumes that the naval bases and operations associated with the bases are removed from New South Wales and are not re-established elsewhere in the state (as discussed in section 4).

A summary of the results are presented in Table 7.1.1.

Table 7.1.1. Economic Impacts Summary

Defence Facility	Employment (jobs)	Value Added ($m)	Turnover ($m)	Consumption ($m)
Regional Impacts				
Sydney Region				
Garden Island	6,784	473.3	812.3	527.6
HMAS *Waterhen*	986	67.9	115.4	76.4
HMAS *Watson*	627	43.2	73.3	48.7
HMAS *Penguin*	540	37.2	63.1	41.9
State Impacts				
Total	8,684	607.6	1,054.4	613.4

Note: The regional impacts do not sum to the state impacts due to different modelling assumptions at the state and regional levels.

It is important to note that the New South Wales total is not simply the sum of the regional results. Each base has been individually modelled at the regional level to estimate the impact of each base on the Sydney region. In addition, an aggregate scenario has been modelled to show the economic impact of the combined Defence facilities on the New South Wales economy.

While the regional impacts show the current economic contribution of the each facility at the Sydney regional level, the analysis at the state level captures flow-on impacts to other regions within the state. Thus the New South Wales results reflect the impact across the state in total.

Overall, the naval bases were found to support 8,684 jobs directly and indirectly in the New South Wales economy. The overall impact on GSP (value added) is positive, with the bases contributing $608 million (2009/10 prices) directly and indirectly each year to the state's value added. The bases contribute to living standards in New South Wales by supporting production and employment in the state economy, with an estimated contribution of $613 million (2009/10 prices) to consumption directly and indirectly each year in New South Wales.

Appendix A – Detailed Results

Economic Impacts of Sydney Naval Bases on the New South Wales Economy			
Industry	**Employment (jobs)**	**Value Added ($m)**	**Turnover ($m)**
Agriculture, Forestry and Fishing	-28	-1.7	-3.4
Mining	-5	-0.3	-0.5
Manufacturing	-146	-9.0	-28.2
Electricity, Gas and Water Supply	-7	-0.4	-0.9
Construction	-113	-7.0	-14.4
Wholesale Trade	291	18.0	43.9
Retail Trade	714	45.6	87.5
Accommodation, Cafes and Restaurants	244	20.4	49.1
Transport and Storage	-135	-8.2	-16.9
Communication Services	482	29.8	50.4
Finance and Insurance	1,151	71.2	111.4
Property and Business Services	-1,338	-80.4	-168.4
Government Administration	5,444	396.8	763.7
Education	622	38.4	44.8
Health and Community Services	967	59.7	75.9
Cultural and Recreational Services	174	12.0	21.2
Personal and Other Services	367	22.7	39.0
Ownership of Dwellings	0	0.0	0.0
Total	**8,684**	**607.6**	**1,054.4**

Economic Impacts of Garden Island Defence Precinct in Sydney			
Industry	**Employment (jobs)**	**Value Added ($m)**	**Turnover ($m)**
Agriculture, Forestry and Fishing	-4	-0.3	-0.5
Mining	-1	-0.1	-0.1
Manufacturing	-114	-7.1	-22.1
Electricity, Gas and Water Supply	-5	-0.3	-0.6
Construction	-85	-5.2	-10.8
Wholesale Trade	264	16.3	39.8
Retail Trade	545	35.1	67.4
Accommodation, Cafes and Restaurants	175	16.0	38.4
Transport and Storage	-116	-7.0	-14.4
Communication Services	434	26.9	45.5
Finance and Insurance	1188	73.6	115.1
Property and Business Services	-1197	-71.9	-150.6
Government Administration	3976	289.5	557.1
Education	486	30.0	35.0
Health and Community Services	761	47.0	59.7
Cultural and Recreational Services	165	11.4	20.2
Personal and Other Services	312	19.3	33.1
Ownership of Dwellings	0	0.0	0.0
Total	**6784**	**473.3**	**812.3**

Economic Impacts of HMAS *Waterhen* in Sydney			
Industry	**Employment (jobs)**	**Value Added ($m)**	**Turnover ($m)**
Agriculture, Forestry and Fishing	-1	0.0	-0.1
Mining	0	0.0	0.0
Manufacturing	-19	-1.2	-3.7
Electricity, Gas and Water Supply	-1	0.0	-0.1
Construction	-14	-0.8	-1.7
Wholesale Trade	37	2.3	5.6
Retail Trade	81	5.0	9.6
Accommodation, Cafes and Restaurants	33	2.1	5.0
Transport and Storage	-19	-1.2	-2.5
Communication Services	64	4.0	6.7
Finance and Insurance	175	10.8	16.9
Property and Business Services	-220	-13.4	-28.1
Government Administration	616	44.9	86.4
Education	71	4.4	5.1
Health and Community Services	112	6.9	8.8
Cultural and Recreational Services	24	1.5	2.7
Personal and Other Services	45	2.8	4.8
Ownership of Dwellings	0	0.0	0.0
Total	**986**	**67.9**	**115.4**

Economic Impacts of HMAS *Watson* in Sydney			
Industry	**Employment (jobs)**	**Value Added ($m)**	**Turnover ($m)**
Agriculture, Forestry and Fishing	0	0.0	-0.1
Mining	0	0.0	0.0
Manufacturing	-12	-0.8	-2.4
Electricity, Gas and Water Supply	0	0.0	-0.1
Construction	-9	-0.5	-1.1
Wholesale Trade	24	1.5	3.6
Retail Trade	52	3.2	6.1
Accommodation, Cafes and Restaurants	21	1.3	3.1
Transport and Storage	-12	-0.8	-1.6
Communication Services	41	2.5	4.3
Finance and Insurance	112	6.9	10.8
Property and Business Services	-154	-9.5	-19.9
Government Administration	405	29.5	56.8
Education	45	2.8	3.3
Health and Community Services	71	4.4	5.6
Cultural and Recreational Services	15	0.9	1.7
Personal and Other Services	29	1.8	3.1
Ownership of Dwellings	0	0.0	0.0
Total	**627**	**43.2**	**73.3**

Economic Impacts of HMAS *Penguin* in Sydney			
Industry	**Employment (jobs)**	**Value Added ($m)**	**Turnover ($m)**
Agriculture, Forestry and Fishing	0	0.0	0.0
Mining	0	0.0	0.0
Manufacturing	-11	-0.7	-2.0
Electricity, Gas and Water Supply	0	0.0	-0.1
Construction	-8	-0.5	-1.0
Wholesale Trade	20	1.3	3.1
Retail Trade	44	2.7	5.3
Accommodation, Cafes and Restaurants	18	1.1	2.7
Transport and Storage	-11	-0.7	-1.4
Communication Services	35	2.2	3.7
Finance and Insurance	96	6.0	9.3
Property and Business Services	-132	-8.1	-17.0
Government Administration	348	25.4	48.8
Education	39	2.4	2.8
Health and Community Services	61	3.8	4.8
Cultural and Recreational Services	13	0.8	1.5
Personal and Other Services	25	1.5	2.6
Ownership of Dwellings	0	0.0	0.0
Total	**540**	**37.2**	**63.1**

Appendix B – Murphy Model Regional (MMR)

This attachment outlines the features of Murphy Model Regional (MMR), the economic model used to simulate the economic impacts of the naval bases on the Sydney regional economy and New South Wales state economy.

MMR estimates the effects of policies or events that are state or region specific. It is a Computable General Equilibrium (CGE) model that divides Australia into 33 regions and 8 states and territories, with 18 industries. MMR uses statistical information from the ABS Input-Output tables and labour force survey. The regions used are based on the ABS statistical regions applied in its labour force survey. The 18 industries correspond to the Australian and New Zealand Industrial Classification (ANZSIC) also used by the ABS. Each region is modelled individually but utilising a consistent approach. MMR is calibrated using national and regional data for 2007/08.

In MMR, a distinction is made between industries that produce tradeables and industries that produce non-tradeables. This distinction is based on specific economic assumptions. For example, industries that produce tradeables have a national or international focus, and production levels of these industries are dependent on prices prevailing on national or world markets. In contrast, industries that produce non-tradeables focus on their own region and production levels of these industries depend on local demand. An increase in local demand will lead to an increase in the prices charged by industries that produce non-tradeables.

Each region in MMR is modelled individually but following a consistent approach. Further, medium-term equilibrium is modelled for each region, which would be broadly achieved over a period of about three years.

This medium-term equilibrium is far enough into the future for equilibrium to be obtained in product markets. Also, consumer spending is at a sustainable level so that the trade account for each region, taking into account both international and inter-regional trade, is in balance.

Further, the medium-term equilibrium is not far enough into the future for businesses in each region to adjust their capital stocks. It is also not far enough into the future for labour markets to attain equilibrium so national industry wage rates are taken as given.

Key Assumptions

The results in this report are based on the standard version of the model, which provides medium-term estimates. The medium-term equilibrium in MMR is based on specific economic assumptions.

On the one hand, this medium-term equilibrium of about three years is far enough into the future for equilibrium to be obtained in product markets. Also, consumer spending is at a sustainable level so that the trade account for each region, taking into account both international and inter-regional trade, is in balance.

On the other hand, this medium-term equilibrium is not far enough into the future for labour markets to attain equilibrium; rather industry wage rates are taken as given. Three years is also not far enough into the future for businesses in each region to adjust their capital stocks.

In MMR, the distinction between industries that produce tradeables and industries that produce non-tradeables is also based on specific economic assumptions.

Industries that produce tradeables have a national or international focus, and production levels of these industries are driven by prices prevailing on national or world markets. In contrast, industries that produce non-tradeables focus on their own region and production levels of these industries depend on local demand.

MMR is flexibly configured so that individual industries can be treated as either producing tradeables or non-tradeables, depending on what makes more economic sense in the context of the particular regional policy.

Consulting

MMR has been used successfully in many projects such as the following.

- "Economic Report into the Major Defence Bases in the Northern Territory" Department of Defence, 2009-10
- "Economic Report into the Major Defence Bases in South Australia" Defence SA, 2009
- "Electricity price Modelling Impacts of Feed-in-Tariff", ACT Government, 2009-10
- "The Economic Impacts of the Manuka Oval and Canberra Stadium", ACT Government, 2009.
- "Economic Impacts of Regional Development Policies in Victoria", Regional Development Victoria, 2009.
- "The Contribution of the Star City Casino Complex to the NSW Economy", URS, 2007.
- "Economic Impact Assessment of the Re-Development of the Centrepoint, Imperial Arcade and Skygarden Shopping Centres", Allens Arthur Robinson, 2006.
- "Modelling the Economic and Social Impacts of Various Scenarios for the RAAF Base Richmond", the Department of Defence, December 2006.
- "The Impact of the Hunter Economic Zone on the Hunter Region and New South Wales Economies", the Hunter Economic Zone, June 2004.
- "The Economic Impact of the Establishment of Business Transformation Outsourcing (BTO) Centres in Brisbane and the Gold Coast", IBM, July 2004.
- "The Impact of Totalcare Industries Limited on the ACT economy", Totalcare Industries Limited, 2001.

Regional Detail

As discussed above, MMR divides Australia into 34 regions. MMR estimates the effects of policies that are state or region specific in each of the following 34 regions, which match the 34 ABS statistical regions.

1. Sydney
2. North Western Sydney
3. Hunter
4. Illawarra
5. South Eastern NSW
6. Richmond-Tweed and Mid-North Coast
7. Northern-Central-Far Western NSW
8. Murray-Murrumbidgee
9. Melbourne
10. Barwon-Western District
11. Central Highlands-Wimmera
12. Loddon-Mallee
13. Goulburn-Ovens-Murray
14. All Gippsland
15. Brisbane
16. South and East Moreton
17. North and West Moreton
18. Wide Bay-Burnett
19. Darling Downs-South West
20. Mackay-Fitzroy-Central Qld
21. Northern-North West
22. Far North
23. Adelaide
24. North and West SA
25. South and East SA
26. Perth
27. Lower Western WA
28. Remainder WA
29. Greater Hobart-Southern
30. Northern Tasmania
31. Mersey-Lyell
32. Northern Territory
33. Australian Capital Territory
34. Australia

Industry Detail

As explained above, each region in MMR contains 18 industries corresponding to the ANZSIC industry divisions used by the ABS. MMR estimates the effects of policies that are state or region specific in each of the following 18 industries.

A. Agriculture, Forestry and Fishing	B. Mining
C. Manufacturing	D. Electricity, Gas and Water
E. Construction	F. Wholesale Trade
G. Retail Trade	H. Accommodation, Cafes and Restaurants
I. Transport	J. Communication Services
K. Finance and Insurance	L. Property and Business Services
M. Government Administration and Defence	N. Education
O. Health and Community Services	P. Cultural and Recreational Services
Q. Personal and Other Services	R. Ownership of Dwellings

Industry Definition

A. Agriculture, Forestry and Fishing: This division includes all units mainly engaged in `agriculture, forestry, fishing and hunting'. The term agriculture is used here in the broad sense to include the breeding, keeping or cultivation of all kinds of animal or vegetable life except forest trees and marine life. Forestry includes afforestation, harvesting and gathering of forest products. Fishing includes the catching, gathering, breeding and cultivation of marine life from ocean, coastal and inland waters. Hunting includes the catching or taking of all types of animal wildlife on land.

B. Mining: The scope of the Mining division includes all units mainly engaged in 'mining', in exploration for minerals, and in the provision of a wide variety of services to mining and mineral exploration, as well as mining units under development. The term `mining' is used in the broad sense to include the extraction of minerals occurring naturally as solids, liquids or gases. The Mining division excludes units mainly engaged in refining or smelting of minerals or ores (other than the preliminary smelting of gold), or in the manufacture of such products of mineral origin as coke or cement. The commodities produced by the Mining division involve the minimum amount of processing to produce a marketable product. Where businesses which have mining units and manufacturing units which further process the mined material and separate accounts are not available, the unit (which both mined and further processed the material) is to be classified to division C Manufacturing.

C. Manufacturing: This division includes all units mainly engaged in manufacturing. In a broad sense manufacturing relates to the physical or chemical transformation of materials or components into new products, whether the work is performed by power driven machines or by hand. In general the manufacture of parts or components is a primary activity of the same group as the manufacture of the finished product except where the manufacture of parts or components is specifically shown as a primary activity of another group.

D. Electricity, Gas and Water: This division includes all units mainly engaged in the generation, transmission or distribution of electricity; the manufacture of town gas from coal and/or

petroleum or the distribution of manufactured town gas, natural gas or liquefied petroleum gas through a mains reticulation system; the storage, purification or supply of water; or the operation of sewerage or drainage systems including sewage treatment plants.

E. Construction: This division includes all units mainly engaged in the construction, repair, alteration or renovation of buildings, roads, railroads, aerodromes, irrigation projects, harbour or river works, water, gas, sewerage or stormwater drains or mains, electricity or other transmission lines or towers, pipelines, oil refineries or other specified civil engineering projects as well as preparation of mine sites, demolition or excavation. Units mainly engaged in certain specified installation or providing special building or construction trade are also included in this division.

F: Wholesale Trade: This division includes all units mainly engaged in wholesale trade. The term `wholesale trade' is used here in the broad sense to include the resale (as agents or principals) of new or used goods to businesses or to institutional (including Government) users. Businesses mainly engaged in wholesale trade are wholesale merchants who take title to the goods they sell; separate sales branches (not being retail stores) operated by manufacturing enterprises; commission agents, import and export agents and purchasing agents; petroleum products distributors; and cooperatives and marketing boards engaged in marketing farm products.

G. Retail Trade: This division includes all units mainly engaged in the resale of new or used goods to final consumers for personal or household consumption or in selected repair activities such as repair of household equipment or motor vehicles. Businesses engaged in retail trade include department stores or other shops, motor vehicle retailers and service outlets, stalls, mail order houses, hawkers, door-to-door sellers, milk vendors, vending machine operators and consumer cooperatives.

H. Accommodation, Cafes and Restaurants: This division includes all units mainly engaged in providing hospitality services in the form of accommodation, meals and drinks.

I. Transport and Storage: This division includes all units mainly engaged in providing passenger or freight transport by road, rail, water or air; terminal facilities for passengers or freight; services related to transport such as car parking, stevedoring, harbour services, navigation services, airport operation or space port operation; booking, travel, freight forwarding, crating or customs agency services; and storage facilities. Units mainly engaged in operating pipelines for the transportation of oil, gas, etc., on a contract or fee basis are included in this division.

J. Communication Services: This division includes all units mainly engaged in providing postal, courier and telecommunication services.

K. Finance and Insurance: This division includes all units mainly engaged in the provision of finance, in investing money in predominantly financial assets, in providing services to lenders, borrowers and investors, in providing insurance cover of all types, and in providing services to insurance underwriters and to people or organisations seeking insurance.

L. Property and Business Services: This division includes all units predominantly engaged in renting and leasing assets as well as units engaged in providing a wide variety of business services. This publication follows the standard in the national accounts and does not include Ownership of Dwellings in this division.

M. Government Administration and Defence: This division includes all Central, State and Local Government units mainly engaged in government administration and regulatory activities, as well as judicial authorities and commissions, representatives of overseas governments, and the Army, Navy and Air Defence forces and civilian units mainly engaged in defence administration. The industry subdivision for Defence excludes units mainly engaged in manufacturing activities (such as naval dockyards and munitions factories) and units mainly engaged in operating colleges or similar educational institutions for the defence forces.

N. Education: This division includes all units mainly engaged in providing education.

O. Health and Community Services: This division includes all units mainly engaged in providing health and community services.

P. Cultural and Recreational Services: This division includes all units mainly engaged in providing cultural and recreational facilities and services.

Q. Personal and Other Services: This division includes units that are mainly engaged in providing personal services.

R. Ownership of Dwellings: This division consists of units mainly engaged in renting or leasing their own or leased residential properties (including space in such properties) or dwellings (other than holiday houses or flats) to others. The activity of owner-occupiers renting or leasing their own dwellings to themselves is treated as a business activity in the national accounts. (Accordingly this division includes, for purposes of national accounts, the imputed or notional property owning units from which the owner-occupiers of dwellings rent or lease their dwellings.) Note: All renting and leasing activities can be performed either as owner or as lease holder. Leasing includes sub-leasing.

MMR Model Outputs

For each region and industry, MMR produces estimates of the effects of regional or state policy changes on:

- employment;
- turnover;
- value added; and
- consumption.